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OCCUPATIONAL HEALTH AND SAFETY ASPECTS OF GREEN SHIPPING IN THE BALTIC SEA*

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Abstract. After the implementation of the SECA regulation in BSR in 2015, one other step towards cleaner shipping will be the NECA regulation from 2021. Thus, green shipping is an important highlight on the Baltic Sea Region (BSR) environmental agenda. It is well known that shipping is one of the most international industries but it also represents one of the most dangerous businesses since maritime sector workers are often exposed to a number of occupational hazards such as difficult and uncontrolled climate conditions, emissions, noise, vibration, chemicals, and long hours of work in combination with rigid organisational structures, isolation and high levels of psychological stress. Maritime workers are often confronted with health problems, occupational diseases, incidents and occupational accidents. This sends a strong pointer that green shipping should also imply greener maritime jobs so that the work becomes safer for workers and corresponds to the global challenges of environmental protection, economic development and social inclusion. The presented research analyses the health and safety aspects of green shipping in the context of occupational health and safety (OSH) to identify set of indicators that are essential to be applied in green shipping. The central research question evaluates health and OSH risks of BSR inhabitants and seafarers to determine the extent to which the SECA regulations have helped to improve health and work related conditions in the BSR.

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1. Introduction

Scientific studies show that air pollution from international shipping accounts for approximately 50,000 premature deaths every year in Europe (CEEH, 2011), which totals an annual social cost of over €58 billion (Underwood & Waterson, 2013). Ship emissions contribute to air pollution through sulphur oxides (SOx), nitrogen oxides (NOx) as well as from fine particles, usually called particulate matter (PM), and black carbon causing negative health impacts of citizens. The particulate matter are linked to premature deaths because when they find through the lungs their way into the bloodstream and trigger inflammations which eventually cause heart and lung failure and could lead to cancer (Boffetta et al., 2001).

Consequently, the International Maritime Organization (IMO) and the European Parliament (EP) decided in 2005 and 2012 to establish the Sulphur Emission Control Areas (SECA) in Northern Europe where operating ships from 2015 must use fuel with a low sulphur content not exceeding 0.1% (Knapp & Franses, 2009). At the end of 2015, European Union approved in the frame of the BSR Interreg Programme the "EnviSuM (Environmental Impact of Low Emission Shipping Measurements and Modelling Strategies) project" to assess the technical efficiency and the socio-economic impacts of clean shipping solutions in the Baltic Sea Region (BSR). After three years of the project activities, some of the published results of the socio-economic impacts of the regulation focused majorly on emission measurements, the efficiency of abatement technologies and economic impacts of SECA regulations on the maritime stakeholders (Atari et al., 2019; Olaniyi, Atari & Prause, 2018).

Before the introduction of SECA regulations in 2015, scholars intensively discussed the tentative impact for maritime stakeholders and estimated economic disadvantages from SECA areas due to high compliance costs for the strict environmental regulations compared to competitors in other parts of the world. Most experts forecasted a disproportionally increase of maritime transport costs in SECA regions initiating a cargo shift from sea to land transport so that shipping companies and ports would lose handling volumes and income. Other discussions argued that the regulations would weaken the competitiveness of European maritime transport especially in the modal shift of cargo flows from marine transport to inland transport routes of which, the implementation costs to the maritime sector up to €11 billion by 2020 (Prause & Olaniyi, 2019).

The EU project “EnviSuM” with 12 partners from all over the Baltic Sea Region (BSR) investigated between 2016 and 2019 the impacts of the SECA regulations and found out that after 2015 no such significant changes are witnessed and that an impressive high level of compliance (ca. 95%) within the BSR was measured. A BSR-wide survey among maritime stakeholders at the begin of the EnviSuM project showed no only neglectable impact of SECA regulations on BSR logistics sector and a later statistical analysis of foreign trade flows and maritime transport revealed no evidences for modal shifts or changes in transport patterns in BSR (Olaniyi & Prause, 2019).

Even the no significant logistics pricing issues were detected since most of the vessels that operate in the Baltic Sea now use low sulphur maritime fuel that was since 2015 most of the time less expensive than the formerly used heavy fuel oil due to low oil prices. Latest results on the estimation of the administrative burden and a real option based evaluation of abatement technology investments by also showed neglectable impact on the maritime industry.

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Hence, the SECA regulation have not met the maritime sceptics that were expected before 2014 (Atari et al., 2019; Prause & Olaniyi, 2019).

The results of the "EnviSuM" project also detected several benefit attached to the SECA regulations for the BSR, some of those include the increase of the air quality within BSR and the reduction of the annual emission of Sulphur into half. However, one benefit with most consequence is the 1000 less premature deaths experienced due to cleaner air and a push of blue growth innovation activities in BSR investigated (Barregard et al., 2019; Repka, 2019). Thus, the SECA regulations seem to have created more innovative technological awareness among the ship owners since its enforcement and generated an innovation push towards clean shipping technologies for BSR companies.

Until now, the socio-economic impact of SECA regulations have been discussed mainly with a focus on environmental and health aspects (Prause et al., 2019). However, the transition towards a green economy and the constant pressure on the economy and environmental issues has opened up new challenges for Occupational Health and Safety (OSH) which includes potential exposure to traditional occupational risks, emerging risks from new technologies, working processes and workforce demographic changes (diverse workforce) (Lee & Nam, 2017; Shabunina et al., 2017). This means that there is need to ensure that green jobs contribute to the protection of ecosystems and biodiversity, reduce energy, minimise materials and water consumption through high-efficiency strategies, de-carbonise the economy and minimise generation of all forms of waste and pollution (Olaniyi, Prause & Boyesen, 2018). In addition, green jobs must symbolise the quality and stable jobs, sound safety and healthy working conditions, adequate wages and good career perspective as well as ensuring workers' right, social dialogue and protection (Lee & Nam, 2017). This has made it important to find out if major emissions (SOx and NOx) control measures will yield positive health impact for the seafarers

Occupational safety issues in maritime sector have been discussed from the point of maritime accidents (Akyuz & Celik, 2014) analysis and prevention (Håvold, 2005) and safety culture assessment (Forsell et al., 2016; Nævestad, 2017). A number of previous studies (Antão et al., 2016; Devanney, 2009; Nævestad, 2017) demonstrated that maritime safety depends on humans, organisations and technical components of the ship system, the marine environment factors as well as in the implementation of the proactive safety management system. In spite of this, there are still limited studies on occupational health especially regarding their health risks assessment when compared to other sectors. This is surprising since conventionally, shipping is perceived to be a relatively dangerous industry that requires proper management of its occupational health and safety, security and environmental issues that are focused on risk assessment and analysing control measures (SIRC, 2018; Talja, 1999; Antão et al., 2018).

In order to prevent risks or to be able to handle them, an efficient risk management process has to be implemented and which is based on the generic management process. This encompasses the following steps: risk identification, analysis, control and mitigation. The risk identification step is often considered as the most important step since only the identified risks can be managed (SIRC, 2018). Risk analysis, especially in transportation sector, involves the identification of the risks, the assessment of the gathered risks and the indication of likelihood occurrence and the possible damage (Schröder & Prause, 2015, 2016; Tvaronavičienė, 2018).

The risks are further prioritised in the order of risk management. Methods supporting risk identification and analysis are commonly brainstorming and the failure mode and effects analysis (FMEA).

In this vein, the research aims to identify the health risks associated with working on ships by exploring what characterizes as hazards or risks introduced by being a maritime worker in the Baltic Sea Region. It further examines if and how the SECA regulations have influenced the health status in the BSR and especially highlighting the conditions of seafarers. The result has the potential to enhance the understanding of enabling and inhibiting factors that can foster ensuring the safety and wellbeing of maritime workers.

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The work is organised as follows: after the introduction, the next section is the literature review importance of emissions regulations, the identification of the occupational health and safety indicators and environmental factors in ports area and in shipping vessels. Then, the system of methods used for this research is described which is followed by the analysis of the primary and secondary data complemented by expert interviews and analyses of occupational accidents cases. The results and their implications are discussed in section four. The conclusions are presented in the last session.

2. Literature Review

Maritime working environment faces physical, ergonomic, chemical, biological, psychological and social factors that may be responsible for occupational diseases, accidents and other harm (Pukkala, 2009). The shipping industry as a complex system - a closed 'social milieu' with all necessary competence on the board (Hetherington, Flin & Mearns, 2006; ILO, 2013) encourages unusually long period aboard exposing the workers to heavy workloads, long shifts, demanding working conditions, isolation, rigid organizational structures and high levels of psychological stress and physical fatigue (Repka, 2018; Rosendahl, 1998).

SOx and NOx emissions from shipping activities both on the ships and the ports not only cause various harmful effects on human health, they affect agricultural crops, ecosystems and material corrosion, and in turn, reduce the actual supply of labour, increase the user cost of capital and decrease productivity. The social costs of these emissions are the costs estimates of the monetized damages associated with their harmful effects (Sanchez & Poschen, 2009).

In the shipping industry, the enforcement of the legislative framework is complex and weak due to the organisational international structure that includes more than 50 International conventions of Maritime Organisation (IMO) and International Labour Organisation (ILO). As a result, the European Framework Directive on Safety and Health at Work (1989/391/EEC) establishes the general principles for managing safety and health (Moreira, Vasconcelos & Santos, 2017). Yet, according to Knapp and Franses (2009), there are still limited data about applications of the relevant guidelines for practice.

Occupational health and safety issues are usually subsumed into environmental and social risks. Diverse studies i.e. Hetherington et al. (2006); Antonsen (2009) and Nævestad (2017) have addressed the different issues within maritime safety and security and have demonstrated the importance of the effective combinations of different related factors. These factors will help to build the framework for the identified risks and include; human factors, organisational factors (social organisation of the personnel on board, operating level), economic pressure, teamwork, social skills, knowledge and training, languages skills, situation awareness, decision-making, communication, automation and technological innovations and safety culture.

Accordingly, taking a bottom-up approach, the authors, clustered the risks in categories that describe their risks sources. The main categories were chosen in accordance with the three pillars of sustainability, i.e. Environmental risks, social risks and economic risks used by Schröder and Prause (2015; 2016). This encompasses the environmental risks the workers are subjected to, the health risks of the population impacted by shipping operations and the safety issues of maritime workers onboard or ashore.

Occupational Environment: Operations, facilities and different activities may create adverse effects on the environment (Antão et al. 2016), thus effective maritime environmental management needs to focus on the potential impact of the work environment on occupational risks. In the BSR, cancer has been said to be very common among ship workers compared to land-based occupations, especially lung cancer and mesothelioma. More so various general diseases such as cardiovascular diseases, work-related stress and depression, hearing impairments have also

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been diagnosed among seafarers (Reinhold, Järvis & Tint, 2015). Studies have also highlighted the negative safety effects of stress, fatigue, manning level, alienation and heavy load as the essential causes of operation errors common in maritime transport (i.e. Allen, Wadsworth & Smith, 2008; CEEH, 2011). Collisions, fires/explosions, personal occupational accidents, homicide, suicide and diseases are also major occupational hazards for seafarers (Hetherington, Flin & Mearns, 2006).

Occupational Safety: Occupational accidents in maritime sector include human factors, prevention measures and interventions (ILO, 2013; Moreira, Vasconcelos & Santos, 2017), which is an important subcategory of social risks that represents "safety deficiencies" due to unknown safety regulations or/and lack of awareness about the relevant regulations or different legal systems (also called "lack of knowledge") (Transport & Environment, 2017). It further includes safety issues of maritime workers onboard or ashore that embraces the exposure to shipping emissions like the SOx and the NOx.

Occupational Health: Healthy workers are a vital prerequisite for social, environmental and economic development and sustainability (Olaniyi, Atari & Prause, 2018; Atstaja et al., 2017; Bernardi, 2019).

The benefits of having healthy workers and safe working conditions are related to the high possibility to recruit skilled workers, an increase of labour productivity and workers' motivation, increased operational performance and reduced social and economic costs of occupational accidents and diseases (Barregard et al., 2019; Schröder & Prause, 2015).

Taking into account these issues, green jobs should be decent; in particular, they should be a healthy and safe environment most especially for the workers' health and their well-being (Schröder & Prause, 2016).

A conspicuous gap in the maritime sector is the lack of reliable and comparable data on the exposure to occupational hazards of the workers, how the possible occupational health risks-safety regulations integrate the everyday operation management into the complex legislative framework, and how this framework is implemented to ensure safe and healthy working environment (Transport & Environment, 2017). According to WHO, a surveillance system in the field of occupational health must collect, analyse and integrate data which enables monitoring workers' health and ensure early detection of significant change caused by working conditions, environment and pollution, an organization of work (Olaniyi, Atari & Prause, 2018). In other words, occupational health and safety (OSH) systems in different countries must be able to integrate different activities such as workers' health surveillance (analysis of mortality, occupational disability, occupational accidents and diseases, absenteeism, lifestyle and unhealthy behaviour), and monitoring of working conditions (risk assessment and management) and the first step to this is the identification of the associated risks.

Systematic accidents analysis in the theory and in practice

The system approach is needed in order to analyse accidents and to find and to understand the of accidents causation. However, a number of studies have demonstrated that the most occident reports are focused on cause-effect models perspective and sometimes not allow the development of more effective and adequate safety precautions (Underwood & Waterson, 2013; Leveson, 2011).

In addition, previous studies suggests that existing systematic accidents analyses techniques are yet accepted by the outside of the safety research (Samuel, 2010), what involve insufficient resources provided for the investigation, a lack of the method reliability, because of the qualitative approach in several existing systemic analyses models (Underwood & Waterson, 2013) as well as the investigator bias (Lundberg, Rollenhagen & Hollnagel, 2010) and, thus, a research-practice gap exists in accidents analyses.

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3. Methodology

3.1 Sampling strategy

The current study is the first study regarding OSH in shipping in one of the Baltic States (Estonia) and therefore, the multi-method approach has been applied. The techniques used in the current research involves two approaches: (i) a top-down approach, what was based on the relevant legislation and regulation as well as interviews from the experts in the field of shipping and occupational health and safety; (ii) a bottom-up approach, what involved in-depth analyses of different indications on the topic of OSH and Environment as well as extended analyses of the cases of the occupational accidents investigations

A literature review identified the existing research gap for this study and it targets identifying risks and their impact on health and work safety of sea workers in the context of the SECA regulations and the forthcoming NECA regulations. For this purpose, the research design constitutes as follows:
The primary empirical evidence in this paper is based on the qualitative research approach according to Talja (1999). Here, the complexity of the research requires personal interviews because risk management addresses a sensitive issue of a workplace and it was important to build trust with the different respondents for data gathering. The multi-method approach consisted of using expert interviews and multiple case studies of occupational accidents. All together 25 cases of occupational accidents in the ships were analysed. The data were collected during the period of 2013-2018 and 2019. The main research methods were document analysis (critical discourse analysis).

3.2 Participants and design of interviews

Interviews were conducted with five experts in the field of maritime OSH: occupational health physician (Int 1), labour inspector specialized in the maritime sector (Int 2), a statistician in occupational accidents and diseases from Labour Inspectorate (Int 3), and head of the Estonian Seamen's Independent Union (Int 4) and a safety manager (an employer's representative) (Int 5). The purpose of these interviews was to gain detailed knowledge on working environment, health and safety of maritime workers, identify potential risk factors and ways to manage them, gather data on possible and actual health problems and identify the steps towards progressive improvement in the field of OSH. The interview questions were designed in order to explore current shortages of the OSH system in maritime sector as well as understand the following topics: (1) the experts' knowledge about relevant national and international legislation (e.g. SECA), (2) the awareness about the current OSH situation and possible accident causation, (3) the possible barriers of the effective safety management system in the maritime sector, particular in ships, (4) the main occupational hazards and health risk of the employees, (5) possible good practices in safety management system in maritime sector.

The interviews were conducted by two experienced university researchers in Estonian language. Each interview lasted about 50 minutes on average.

4. Results and discussion

The current section begins with a description of risk awareness from working on ships and OSH knowledge. Then, we present the analysis of the different OSH management practices and report the main occupational hazards based on the results from the interviews with experts. This is followed by an account of key findings about risk prevention and the role of external experts and OSH service providers in enhancing environment, health and safety in the maritime sectors. The last element of the account of the key findings concerns possible barriers, routines ensuring safety and health work and good OSH practices as well as what determines the arrangements for effective environmental and OSH management practice in the context of Estonian maritime sector.

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4.1 Occupational risk awareness and perceptions from working on a ship

Risk awareness may be affected by the level of education and training received and skills developed by the employer and workers in the maritime sector; commitment of the top-management to safety; an ability and possibilities of experienced workers to transfer the good and safe work routines to younger and unexperienced workers, the role of external OSH providers and experts as well as the level of control and supervision performed by the external authorities, for example by the Labour Inspectorate. Risk awareness and general knowledge about occupational hazards in the maritime sector is based on the experience of the workers and/or education received by workers at the maritime schools (mainly technical personnel), however the majority of the personnel are workers, particular service personnel, who need to recieved adequate safety training.

Based on results of interviews with experts, it is possible to say, that risk awareness at a general level among employers and workers is good, there are aware of the main occupational risks and preventive measures.
The interviews with all specialists emphasized the work in the maritime sector as is one of the most challenging and hazardous occupations.

The current study is the first step in addressing all these issues in the maritime sector by applying the bottom-up clustering approach (i.e. occupational environment, safety and health), sources of the identified risks are categorised as follows:

Occupational Environment: According to the data from the interviews with the statistician and occupational health physician, the major health risks associated with occupational diseases among seafarers are musculoskeletal disorders (MSD) caused by physical strains, repetitive movements and compulsory postures. MSDs are generally injuries and disorders that affect the human body's musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, blood vessels, etc.). An employer's representative (Int 5) also confirmed this findings by describing common MSDs in their company:

'We have several cases of the diagnosed occupational diseases caused mainly by repetitive movement and physical strains. The most common diagnoses MSD is carpal tunnel syndrome among service personnel. Workers are complaining about high physically and psychologically strenuous work and we are trying to deal with it by providing different training and instructions' (Int 5)

In addition, the category of occupational hazards also includes noise and vibration, especially during the winter time, because of icy conditions, and while arriving at the port or leaving it. Workers can be also exposed to chemicals, from exhausts and skin contact with oils. During maintenance of the ships, toxic paints and solvents are often used with no special attention of their toxicity to health. The latter was indicated also by labour inspector who stated:

'During the check-ups I have noticed that seafarers use paints in packages without correct labelling or absence of material safety datasheet. Workers are not familiar with health hazards those paints and solvents can cause'. (Int 2)

Occupational Health: In Estonia, occupational health services (OSH services) are provided only by private companies, what constitute an important infrastructure which provides not only expert advice and counselling to the employers and the workers, safety training, but also institutes preventive and control actions in the field of health and safety at work, such as risk assessment and health surveillance (health check-up).

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However, the interview with occupational health physician (Int 1) revealed that the ordinary health check-ups (to receive health certificate for working in the maritime sector) do not examine the workers' health problems in-depth. The examination takes place every 2 years and is largely based on the worker's health declaration. During the visit that usually lasts for about 30-45 minutes depending on patient and problems, visual checks, audiometry, blood and urine tests are conducted. When serious problems are detected, the occupational health physician involves specialists.

The toxic damages from chemicals are tracked with haemogram with leukogram (hB-CBC-5Diff). When changes are detected, medically, the reason behind may be complex making it difficult to conclude if the changes have occurred because of the working environment or a person's lifestyle. Toxic damages are detected from urine sample as well – changes in liver and/or kidney functions are indications of health problems but also remain unclear whether the changes have occurred due to alcohol consumption or from exposure to toxic chemicals at work or in the environment. In the vessels, there can be various occupational exposure to toxins and chemicals, which may contribute to cancer development. There are, however, only a few cases per year when the seamen's health indicators do not meet the requirements but the differences are detected because of serious diseases like diabetes, cancer, liver and kidney failures or hearing impairment or visual impairment. At the same time, regarding regular health check-ups the employer's representative reported:

'*We are conducting the risk assessment by ourselves and based on its results we organize regular medical examination and assessment of workers' health conducted by occupational health physicians. However, I do not highly value the prevention role of this formal procedure and the feedback and recommendations received after health surveillance provided by occupational health physicians. It is very seldom when we receive some restrictions, for example, some worker does not fit for the work or valuable advices what need to be done or improved in the working environment. In the large passenger ship, there is also a healthcare worker, whose role is to serve passengers.'* (Int 5)

Occupational Safety: Our research confirmed previously known situations in occupational safety in the ships. Occupational accidents mainly occur while slipping, tripping and falling (sprains, dislocations, strains), while doing manual handling of loads (mainly back injuries) or working with chemicals (mainly dermal corrosions or eye damages). Interview with labour inspector revealed that there is a lack of resources to conduct comprehensive inspection over the compliance with requirements of OSH in the maritime sector:

'It takes enormous time to carry out the inspections on ships. We can reach only those who sail close-by and hardly manage to control ships which are farer away. We do not know what conditions occur on those ships; usually we get feedback only through the accident reports'. (Int 2)

The head of the Estonian Seamen's Independent Union confirmed the statement and added that working conditions are observed only occasionally while the most complicated conditions occur during arriving at the port.

In larger vessels, the safety management is usually efficient and regular working environment monitoring is evident but in smaller vessels, the conditions may be considerably harder and workers may be exposed to different health risks. During the interview, labour inspector stated the main shortage in occupational safety:

'Considering occupational safety, I can say the main shortage: lack of safety instructions. One good example is a towing vessel. I have experienced several times that there is no safety instruction about towing even when it's known as a very hazardous activity'. (Int 2)

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Consequently, it means also lack of personnel safety training and common understanding about safe behaviour while doing the job. At the same time, an employer representative, claimed that all health risks are under the control in the ships, because of the regular safety training of top-management and workers:

'All risks are under the control, because we have conducted an effective three-days safety training for top-management. In addition, the structure and clear instructions support good safety performance. The level of workers' safety knowledge is also high and they notice and report deficiencies in the safety management system. ' (Int 5)

Quality of workplace risk assessment: On ships, similar regulative requirements are valid as for other working environments: enterprises have to conduct risk assessment and notify the employees of the occupational hazards, the results of risk assessment and of the measures to be implemented in order to prevent damage to health. According to labour inspector, the content of risk assessment is often weak:

'During the visits on the ships, I always start with analysis of the risk assessment to get the better overview of the working conditions on this particular ship. The quality is varied. The main shortages are inadequate levels of risk, absence of assessment of certain occupational hazards, weak connection of usage of personal protective equipment and outcomes of risk assessment. I feel that ship owners do not perceive the importance of risk assessment in order to avoid occupational accidents and diseases'. (Int 2)

This was also confirmed by the occupational health physician:

'The quality of existing risk assessment varies. It is possible to say that the main weaknesses of the risk assessment are absence of exposure assessment (measurements), unsystematic evaluation and assessment of health risks as well as insufficient assessment of psychosocial and chemicals risks, as well as absence of exposure assessment. In comparison to the manufacturing sector, the family doctor can also conduct workers' health examination in the maritime sector. In this situation, sometimes, it means, that workers' health examination is performed without necessary relation to risk assessment and exposure assessment of the hazards in the workplace.' (Int 1)

When the researchers asked employer representative more precisely about the cooperation with occupational health doctors and possible benefits of conducting health surveillance for workers, employer representative could not name any benefit or expected specific outcome.

Additionally, employer representative has demonstrated good awareness about the legislative requirements (e.g. rights and responsibilities of workers and employers, risk assessment, health surveillance, safety training and instructions, occupational hazards, personal protective equipment, etc.) and stated that chemicals measurement are conducted on the ships and in the port area, but the main focus on environmental issues and not on occupational exposure of workers.

To the question about risk assessment and control measures implemented in order to minimise health risk of chemicals on the ships, an employers' representative (Int 5) has stated that:

' *...the system of using of chemicals on the ships are mainly closed system and our workers are all an experienced workers and do their work carefully, what greatly minimise the risk of exposure and possible adverse health effects.*' (Int 5.)

This finding confirmed previously known situation in the field of OSH in Estonia, that employers and workers have the attitude that workers should deal with hazardous situations themselves – the responsibility is clearly on them as

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individual workers, thus deflecting attention away from organisational issues in the management of the work process (SESAME, 2018). At the same time, it is important not to overestimate the sustainability and generalisability of this OSH knowledge in terms of its organisational embeddedness.

This findings are on a line with other studies (Antão, Calderón, Puig, Michail, Wooldridge, Inov, Darbra, 2016; Zhen, 2018) that demonstrated the importance of proper management of occupational health and safety, security and environmental issues what requires to continually monitor risks, to set up the indicators in order to assess the safety performance.

4.2 Systemic accidents analysis: human and organisational factors, examining the gap between theory (research) and practice

A number of studies have identified the systems approach in socio-technical system accidents as separate parts in accident analyses and human factor research (Underwood & Waterson, 2013). Hassel with colleagues (2011) identified the underreporting of maritime accidents as a problem for authorities trying to enhance safety through the relevant legislation, as well as fo other stakeholders using statistical data and analysis of the accidents for decision-making process.

One of the essential safety indicators regarding safety performance on the ships can be the number of accidents, incidents and near misses. For the current study we analyse 25 cases of the occupational accidents in Estonian maritime sector.

While examining the occupational accidents reports, it was revealed that no fatal accidents have occurred during the last 3 years. Half of the accidents resulted with minor injuries and half of the accidents with serious injuries (such as bone fractures, hand injuries with machines with sharp or rotating parts, burnings, serious back injuries etc). Many of the accidents have occurred because slipping, tripping and falling. 24 ships out of 25 confirmed that they have completed the workplace risk assessment, yet, the accident occurred. Many reports said that the reason lies behind worker's incautiousness, carelessness, violation of safety rules, loss of control over the equipment, wearing no appropriate personal protective equipment. To conclude, maritime companies often blame workers on accidents occurring rather than finding root causes and weaknesses in management activities to ensure safe workplaces in ships. While examining the length of employment, the investigation revealed that about two third of the accidents occurred during the first 2 years of working when the seamen have likely not gained enough experience about safety and work practices in difficult conditions and may have not reached to the full proficiency, yet. A few accidents occurred in 11…17 years of employment where seamen may have lost the attentiveness in routine work. To conclude, it is possible to say that one of the essential findings from the analyse of the investigations of occupational accidents and interviews is that occupational accidents mainly occur while slipping, tripping and falling. The main causes of the accidents identified in the official investigation reports were (1) breach of safety requirements by employee, (2) difficult weather conditions, (3) wet or uneven surfaces and (4) improper training.

In addition, some other studies have demonstrated the important of the systematic investigation process of accidents and the essential role of human and organisational factors in maritime accidents (Chauvin, Lardjane, & Morel, 2013; Ergai, Cohen, Sharp, Wiegmann, Gramopadhye, Shappell, 2016).

Results from interviews with experts from Labour Inspectorate and Estonian Seamen's Independent Union, and employer representative claimed that compounding these barriers is the fact that many hazards and risks are automatically accepted as a part of the job, and no complaints made when a minor accident happens. It was reported by the expert:

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'It seems that the responsibility for safety is clearly dedicated on individual worker on the ship. Both, employers and workers have the attitude that workers should deal with hazardous situations themselves and minor accidents are not reported and investigated. Only formal requirements are met from the organisational issues in the management of the work process.' (Int 4)

4.3 SECA Regulations and Air Quality Measurement Result

Regarding the impact of the SECA regulations on the health and safety of the maritime workers, the empirical results of the EnviSuM project revealed new results. Barregard et al. (2019) made investigations in the port area of Gothenburg using the measurement results during the project at different places and were able to estimate the number of reduced extra deaths due to SOx emissions in BSR to be about 1000 deaths. Germany and Russia are the countries with the highest numbers of reduced deaths due to their high population. All in all, the results of the "EnviSuM" project detected an increase of the air quality within BSR and the reduction of the annual emission of Sulphur into half.

An important part of the EnviSuM project work is dedicated to the study of the socio-economic impact of the SECA regulation by measuring air quality together with the evaluation of these impacts. In work package 3 of the project a collection of air quality measurements in the pilot cities of Gothenburg in Sweden, the Tricity (Gdansk, Sopot and Gdynia) in Poland and St. Petersburg in Russia will help to assess the effect of the new legislation. The air quality measurements were made for a 6 month navigation season in year 2016 near the port. In St. Peterburg there will also be a 7 days campaign on a boat. Measured components will include NOx, SOx, CO, PM10, and PM2.5. In order to reach comparability of the measurement results between all pilot cities intercalibration of the measurement equipment will be conducted by the Finnish Meteorological Institute (FMI). FMI maintain the accredited calibration and standard laboratory capable for providing SI traceable calibration service for NOx, SOx and CO measurements.

The investigations of the EnviSuM project also brought to the limelight that the air quality in BSR improved by at least 70% after the enforcement of SECA regulations. Repka, (2018); Jonson, (2018) gave a detailed analysis of the results that show a decrease in air pollution from shipping to be 71% in Norway and around 6% in Russia. In total, the sulphur deposition in the BSR has decreased by 50% from 2014 to 2016. Borkowski (2017) analysed the air quality in the urban area of the Polish Tri-city (Gdynia - Sopot - Gdansk) and calculated the SOx pollution caused by port operations from ships and identified significant reduction in SOx concentrations in close ports areas which are up to 20 times higher than in distance-port areas affirming that close proximity to shipping increases exposure to pollutants.

Over 3 years after the SECA regulations implementation in the BSR, a renew focus is now on the 2020 global Sulphur limit, a law which affect a wider audience and culture than the SECA. Hence, it is important to point out the results of Lähteenmäki-Uutela et al. (2019) who were able to show that the SECA regulations spurred the innovations of clean and environmental technologies of BSR economy so that BSR companies possess a vanguard position of clean shipping technology bearing the opportunity that from 2020 the BSR may become an important export region for clean shipping products all over the world. Thus, the OHS improvements of seafarers from BSR might be also exported with the start of the global sulphur limit from 2020.

5. Conclusion

This paper attempted to get knowledge about occupational risks for seafarers in the BSR. The study revealed the different risks the authors classified using a bottom-up clustering approach of potential sources from the environmental sustainability standpoint i.e. environmental (occupational environment), social (occupational safety) and economical (occupational health), a new contribution to the industry.

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The results of the "EnviSuM" project showed only neglectable impact of SECA regulations on BSR logistics sector and no evidences for modal shifts or changes in transport patterns in BSR. Hence, the end result of the SECA regulation is positively different from the widly publisied sceptisim before 2014. On another handside, the study further confirms that even though proximity with the source of pollution determine the level of exposure and increases occupational health and safety risk, the SECA regulation may have positively improved the health and safety of maritime workers since the air quality in BSR has improved by at least 70% after the enforcement of the regulations.

The study results have also demonstrated the importance of a holistic approach to occupational health and safety, environmental issues in the maritime sector. These issues are essential not only to comply with relevant legislation and requirements but also to diminish possible costs and to safeguard the environment, and ensure a healthy, and safe working environment. The causes and mechanisms behind the most serious cases would certainly need further clarification and future research should also include maritime risks prioritisation and handling management.

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References

Akyuz, E., Celik, M. 2014. Utilisation of cognitive map in modelling human error in marine accident analysis and prevention. Safety Science, 70, 19-28.

Allen, P., Wadsworth, E., Smith, A. 2008. Seafarer's fatigue: a review of the recent literature. International Maritime Health, 59: 81-89.

Antão, P., Calderón, M., Puig, M, Michail, A., Wooldridge, C., Inov, Darba, R.M. 2016. Identification of Occupational Health, Safety, Security (OHSS) and Environ-mental Performance Indicators in port areas. Safety Science, 85, 266–275.

Atari, S., Bakkar, Y., Olaniyi, E.O., Prause, G. 2019. Real options analysis of abatement investments for sulphur emission control areas compliance. Entrepreneurship and Sustainability Issues, 6(3), 1062−1086. https://doi.org/10.9770/jesi.2019.6.3(1)

Atstaja, D., Susniene, R., Järvis, M. 2017. The Role of Economics in Education for Sustainable Development; The Baltic States' Experience. International Journal of Economic Sciences, VI (2): 1-29.

Barregard, L., Molnàr, P., Jonson, J.E., Stockfelt, L. 2019. Impact on Population Health of Baltic Shipping Emissions, International Journal of Environmental Research and Public Health 2019, 16, 1954, https://doi.org/10.3390/ijerph16111954

Bernardi, A. 2019. The capability approach and organizational climate as tools to study occupational health and safety. Insights into Regional Development, 1(2), 155-169. https://doi.org/10.9770/ird.2019.1.2(6)

Boffetta, P., Dosemeci, M., Gridley, G., Bath, H., Moradi, T., Silverman, D. 2001. Occupational exposure to diesel engine emissions and risk of cancer in Swedish men and women. Cancer Causes Control 12(4), 365–374.

Borkowski, T. 2017. Changes in air quality in the Tri-City (Gdynia, Sopot and Gdansk) related to the operation of seaports and changes in SECA requirements, Mari-time University of Szczecin, EnviSum Project meeting in Tallinn, 11-12 October 2017.

CEEH, 2011. Assessment of Health - Cost Externalities of Air Pollution at the Nation-al Level using the EVA Model System, CEEH Scientific Report No. 3, Roskilde, ISSN 1904-7495.

Chauvin, C., Lardjane, S., Morel, G. 2013. Humana nd organisational factors in mari-time accidents: Analysis of collisions at sea using the HFACS. Accident Analysis and Prevention, 59, 26-37

Devanney, J. 2009. Uses and Abuses of Ship Casualty Data. Centre for Tanker Excel-lence.

Forsell, K., Eriksson, H., Järvholm, B., Lundh, M., Andersson, E., Nilsson, R. 2016. Work environment and safety climate in the Swedish merchant fleet. Int Arch Occup Environ Health, 90, 161–168.

Ergai, A., Cohen, T., Sharp, J., Wiegmann, D., Gramopadhye, A., Shappell, S., 2016. Assessment o fthe Human Factors Analysis and Classification System (HFACS): Intra-rater and inter-rater reliability. Safety Science, 82: 393-398

Hassel, M., Asbjørnslett1, B.E., Hole, L.P. 2011. Underreporting of maritime acci-dents to vessel accident databases. Accident Analysis and Prevention, 43: 2053– 2063.

Hetherington, C., Flin, R., and Mearns, K., 2006. Safety in shipping: The human element. Journal of Safety Research, 37, 401–411.

Håvold, J, I. 2005. Safety-culture in a Norwegian shipping company. Journal of Safety Research, 36, 441 – 458.

ILO. Appendix IV: Draft Guidelines concerning a statistical definition of employment in the environmental sector – The nineteenth International Conference of Labour Statistics (ICLS). 2013. Geneva. ILO: 2013.

Jonson, J.E. 2018. Regional Air Quality modelling, XVII International Environmental Forum «Baltic Sea Day», 22-23 March 2016 in St. Petersburg, Russia.

Knapp, S., Franses, P.H. 2009. Does ratification matter and do major conventions im-prove safety and decrease pollution in shipping? Marine Policy, 33: 826-846.

Lähteenmäki-Uutela, A., Yliskylä-Peuralahti, J., Olaniyi, E., Haukioja, T., Repka, S., Prause, G., De Andres Gonzalez, O. (2019). The impacts of the sulphur emission regulation on the sulphur emission abatement innovation system in the Baltic Sea region. Clean Technologies and Environmental Policy, 1−14. https://doi.org/10.1007/s10098-019-01684-2

Lee, T & Nam, H. 2017. A Study of Green Shipping in Major Countries: In the View of Shipyards, Shipping Companies, Ports and Policies. The Asian Journal of Shipping and Logistics, 33: 253-262.

Leveson, N.G. 2011. Engineering a Safer World. Systems Thinking Applied to Safety. Massachusetts Institute of Technology: The MIT Press.

Lundberg, J., Rollenhagen, C., Hollnagel, E. 2010. What you find is not always what you fix—How other aspects than causes of accidents decide recommendations for re-medial actions. Accident Analysis and Prevention, 42(6), 2132-2139.

Moreira, S., Vasconcelos, L. and Santos, C.S. 2017. Sustainability of green jobs in Portugal: a methodological approach using occupational health indicators. Journal of Occupational Health, 59: 374-384.

Nævestad, T-O. 2017. Safety culture, working conditions and personal injuries in Nor-wegian maritime transport. Marine Policy, 84: 251-262.

Olaniyi, E.O., Atari, S., Prause, G. 2018. Maritime energy contracting for clean ship-ping. Transport and Telecommunication, 19(1), 31−44. https://doi.org/10.2478/ttj-2018-0004

Olaniyi, E., Prause, G. and Boyesen, J. 2018. The impact of SECA regulations on clean shipping in the BSR. In: Ölçer, A, Kitada, O., Dalaklis, D., Ballini, F., (eds) Trends and Challenges in Maritime Energy Management book series of WMU Studies in Maritime Affairs. 6(1), 309–323, https://doi.org/10.1007/978-3-319-74576-3

Prause, G.; Olaniyi, E. O. (2019). A compliance cost analysis of the seca regulation in the Baltic Sea. Entrepreneurship and Sustainability Issues, 6(4), 1907−1921. https://doi.org/10.9770/jesi.2019.6.4(26)

Prause, G., Reinhold, K., Järvis, M., Olaniyi, E., Tint, P. (2019). The Socio-Economic Impact of Green Shipping: A Holistic View from the Baltic Sea Region. Springer Lecture Notes in Networks and Systems 68, 615-624.

Pukkala, E. et al., 2009. Occupation and cancer—follow-up of 15 million people in five Nordic countries. Acta Oncol 48(5): 646–790.

Reinhold, K., Järvis, M., Tint, P. 2015. Practical tool and procedure for workplace risk assessment: Evidence from SMEs in Estonia. Safety Science, Volume 71 (C): 282-291.

Repka, S. 2019. Costs and benefits related to compliance with the SECA regulation, EnviSuM final Conference, 24 April 2019 in Copenhagen, Denmark.

Rosendahl, K.E., 1998. Social Costs of Air Pollution and Fossil Fuel Use – A Macroeconomic Approach, Statistics Norway, ISBN 82-537-4542-7.

Samuel, A., 2010. The influence of working environment on workers productivity: a case of selected oil and gas industry in Lagos, Nigeria. African Journal of Business Management, 4(3): 299-307.

Sanchez, AB., Poschen, P. 2009. The social and decent work dimensions of a new agreement on Climate Change: A technical Brief. International Labour Office.

Schröder, M., Prause, G. 2015. Risk management for green transport corridors. Journal of Security and Sustainability Issues, 5 (2), 229−239. https://doi.org/10.9770/jssi.2015.5.2(8)

Schröder, M., Prause, G. 2016. Transportation of dangerous goods in green transport corridors - conclusions from Baltic Sea Region. Transport and Telecommunication, 17 (4), 322−334. https://doi.org/10.1515/ttj-2016-0029

SESAME, 2018. Safety and health in micro and small enterprises in the EU: Final report from the 3-year SESAME project. European Agency for Safety and Health at Work https://osha.europa.eu/en/tools-and-publications/publications/safety-and-health-micro-and-small-enterprises-eu-final-report-3/view Accessed: 01 April 2019.

Shabunina, T.V., Shchelkina, S.P., Rodionov, D.G. 2017. An innovative approach to the transformation of eco-economic space of a region based on the green economy principles. Academy of Strategic Management Journal, 16(1): 176-185.

SIRC, 2018. Studies on the various issues related to the transnational composition of ship crews are available on the Seafarers' International Research Centre website, http://www.sirc.cf.ac.uk/SIRC_free_online_reports.aspx Accessed: 01 May 2018.

Talja, S. 1999. Analyzing qualitative interview data: The discourse analytic method. Library & Information Science Research, 21(4), 459-477.

Transport & Environment. 2017. Air pollution from ships, https://www.transportenvironment.org/what-we-do/shipping/air-pollution-ships,28.06.2018

Tvaronavičienė, M. 2018. Toward efficient policy making: forecasts of vulnerability to external global threats. Journal of Security and Sustainability Issues, 7(3), 591-600. https://doi.org/10.9770/jssi.2018.7.3(18)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 7 Number 1 (September)
http://doi.org/10.9770/jesi.2019.7.1(1)

Underwood, P. & Waterson, P. 2013. Systematic accidents analysis: Examining the gap between research and practice. Accidents Analysis and Prevention, 55, 154-164

Zhen, L., Li, M., Hu, Z., Lv, W., Zhao, X. 2018. The effects of emission control area regulation on cruise shipping. Transportation Research, Part D, 62, 47-63.

WHO, 2012. Health in green economy: Measuring health gains from sustainable de-velopment. Geneva: World Health Organisation – Public Health and Environment De-partment, Health Security & Environment Cluster.

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ANALYSIS OF CONSUMER PREFERENCES RELATED TO THE USE OF DIGITAL DEVICES IN THE E-COMMERCE DIMENSION*

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Abstract. The paper deals with investigating thorough analysis that reveals the impact of digitalisation as the development of new communication platforms are changing consumer's purchasing behaviour in the online environment. The main aim of our research is to identify the dynamics of consumer preferences in relation to the communication platforms of digital equipment for purchase in the online environment. To fulfil the aim of the research we are in the period of February - June 2016 conducted a questionnaire survey located across the whole territory of Slovakia. The sample is representative of the Slovak population by gender, age, highest education level of economic activity. For data analysis we used appropriate methods. This article provides information about consumer preferences related to the use of digital devices when people do their shopping online via the Internet. Depending on the results of the analysis, it can be stated that the most preferred device is the notebook for both groups of respondents surveyed, statistically significant gender differences were not detected. The paper includes practical implications particularly for business entities, because knowledge of the options that digital technology conceals leads to the right set of strategies and will follow the effective achievement of business aims. The paper gives attention to do the role brands and marketers, if he wants to succeed in today's extremely competitive battle for customers to identify deeply rooted motives as well as and preferences of consumers.

Keywords: online shopping; e-business; e-commerce; smartphone; tablet; Slovakia

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1. Introduction

It is important to note that often the term e-commerce is confused with the concept of e-business, which is significantly differentiated. Their distinction is explained by one of the biggest marketing experts, according to Kotler (2007) e-business includes all the electronic exchanges of information in the company or between the company and the customer and, on the other hand, e-commerce represents the process of buying and selling supported by electronic means, primarily via the Internet. E-commerce dates back to the 1960s when the development in the field of electronic data interchange, EDI (Electronic Data Interchange) has enabled the exchange/transfer of business documents between computers (Tian & Stewart, 2008). E-commerce is any transaction that takes place via the computer network and results in the transfer of ownership or rights to use goods or services (Delina & Vajda, 2008). E-commerce can be considered as a system allowing a direct connection of key business entities, i.e. between the seller and customer to make their business relationships more attractive, through the use of electronic networks to enable day-to-day business activities such as payments or delivery of goods and providing the service (Bhasker, 2013; Bačík et al., 2014). It should be added that e-commerce is not limited to make purchases or sales of goods. E-commerce is a whole range of digital technologies that enable electronic communication (Chaffey, 2009; Štefko et al., 2010). Clemente (2004) explains e-commerce as a concept that refers to active marketing and also to the sale of goods and services on the Internet. Lawson (2015) claims that e-commerce means freedom. Freedom to do business without being in the same room or even in the same country.

2. Review of Past Studies

The advantage of e-commerce according to Buttla (2009) is that companies have experienced higher revenues that have been achieved by lowering operating costs, increased sales, but also the possibility of selling advertising space or, even according to Combe (2006), some companies operate e-shops due to presumption that it is a new interactive communication channel. With the ongoing trend of globalization, supply chain management is increasingly becoming more complex for businesses (Šoltés & Gavurová, 2010). Operations managed by experts are now largely automated (Curtis & Cobham 2012; Gavurova et al., 2017). In most cases, the authors agree on the benefits of e-commerce. For each of them, however, the most important advantage is in something else. Schneider (2011) considers the greatest benefit in terms of revenue growth and cost savings. The economic benefits of e-shopping are explained by Manzoor (2010), with the variable cost per unit of digital products being in most cases very low and the fixed costs spread over multiple units, which ultimately reflects revenue growth as well as increased sales. Chromný (2009) also notes a reduction in warehouse inventory and therefore smaller warehouse space, which at the same time leads to a reduction in rental and overheads, and at the same time a lower number of necessary staff and thus lower wage costs.

E-commerce has provided many new opportunities for consumers (Hajli, 2014; Androniceanu et al. 2017; Raudeliūnienė et al., 2019; Pogodina et al., 2019). The rapid expansion of Internet, e-commerce and social media has made the study of consumer behaviour in e-commerce and fundamental research agenda (Liang & Turban, 2011). E-commerce and social media are likely to develop marketing strategies through trust-building mechanisms and affecting customers' intention to purchase online products or to churn. In fact, the rapid growth of e-commerce raises important research questions about the levels of loyalty and churn management in the web environment. This rapid growth reflects the compelling advantages that e-commerce and social media offer over conventional physical stores, including easier interconnectivity and participation on the web (Mueller, et al., 2011). These advancements have developed social commerce into a vibrant and lucrative e-commerce channel, highlighting this is an important point as a customer involvement through social media, which is a key factor in the development of new marketing strategies (Park et al., 2007).

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3. Methodology

The main goal of the research was to identify the dynamics of consumer preferences in relation to communication platforms and digital devices when purchasing in the online environment. For a more detailed specification of their changing shopping habits, we have also decomposed the main research target at these sub-targets:

- Identify consumer preferences related to the use of digital devices when performing various online activities.
- Find out what kind of devices are used by respondents when they are buying products online.

Based on the main and partial objectives of our research, the following hypothesis was formulated: H1: Gender differences in the use of digital devices are statistically significant when people buy products online.

In order to meet our defined research goal, we conducted a questionnaire survey in the Slovak Republic between February and June 2016. Due to incomplete completion, 23 questionnaires were excluded. The data obtained was evaluated using the Microsoft Office package, in particular the Excel spreadsheet editor. The IBM SPSS Statistical Software was used for mathematical and statistical analyses. Due to the scale of the questionnaire, we used simultaneous parallel profile testing and correlation analysis.

The research sample obtained within the questionnaire survey can be considered representative in relation to the Slovak population. The survey consisted of 414 respondents, of which up to 256 (62%) were women and 158 (38%) men. Respondents were, in terms of the age cohorts, divided into consumers so called X generation (36-52 years) with 72% representation and Y generation (16-35 years) with a 28% representation. The group of respondents with a basic level of education was exactly 10 respondents. Respondents with secondary education without school leaving examination had 14 respondents (3%) and with a school leaving examination 156 (38%). More than half of the respondents (57%) involved in the survey were people with university education. At the same time, it is also the most numerous group of all respondents. In terms of economic activity, the survey was attended by almost the same number of employees working in the public sphere (26%) as well as in the private sphere (27%). On the other hand, only a little more (in the number of 114 respondents), our survey sample consisted of students representing 28% of all respondents. The group of self-employed or entrepreneurs accounted for 13% of the respondents. The survey was also filled by unemployed people, who formed less than 4%. The entry "Other" was marked by 14 respondents. Among them were women on maternity leave or men on parental leave, disabled, retired people, a truck driver, a community worker, or people working abroad.

4. Result

Relevant outcomes from the survey are declared in the following sections of this article. One of our questions was which digital devices respondents preferred to perform selected online activities. According to the fact, that respondents did not choose any of the options for some items, we assume they do not perform those activities. The strong penetration of mobile devices in the Slovak market may have increasing potential, but the results of the research reveal that more people prefer laptops instead of smartphones for various online activities. In the case of all three activities to which we have drawn our attention, it is clear that both generations prefer the above mentioned notebook. When searching for general information, one third of women prefer smartphones and only 26.58% of men prefer smartphones. Only 5.47% of women search for information using tablets, while tablets among men are slightly popular (13.92%). However, notebooks are the most popular. Almost half of the men (48.10%) surveyed and more than half of the women (53.91%) search for information online using notebooks.

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When searching for information about products, it is similar to the one in the previous case, as the notebook is dominating among the respondents. 24% of women use smartphones to look for information about products. Only 7% of women prefer tablets, and the vast majority of women (almost 60%) prefer to search for information about products using a laptop. Nearly 22% of men prefer their smartphones to search for information, 10.13% use tablets, and as in the case of women, more than half of the men prefer notebooks.

Even when purchasing products of reflected in Table 1 and Figure 1, it is clear that consumers still prefer notebooks instead of smartphones and tablets. For women, it is up to 75%, and 67% of men buy from e-shops more often using a notebook. The research also points to the fact that women use smartphones to search for general information and not to buy products. The situation is the same with men. Tablets are generally the least used digital devices, but women use them to search for information about products (7%), while twice as many men use tablets to search for information of a different character (14%).

While the notebook is the most used device for purchasing products in the online environment in 75% of women, on the other hand it is -8 points compared to men.

Table 1. Activities carried out through digital devices (in %)

Activity	Smartphone		Tablet		Notebook	
	Female	Male	Female	Male	Female	Male
Search for general information	31.25	26.58	5.47	13.92	53.91	48.10
Search for product information	24.22	21.53	7.03	10.13	59.38	54.43
Buying product	10.16	11.39	4.69	6.33	75.00	67.09

Source: own elaboration

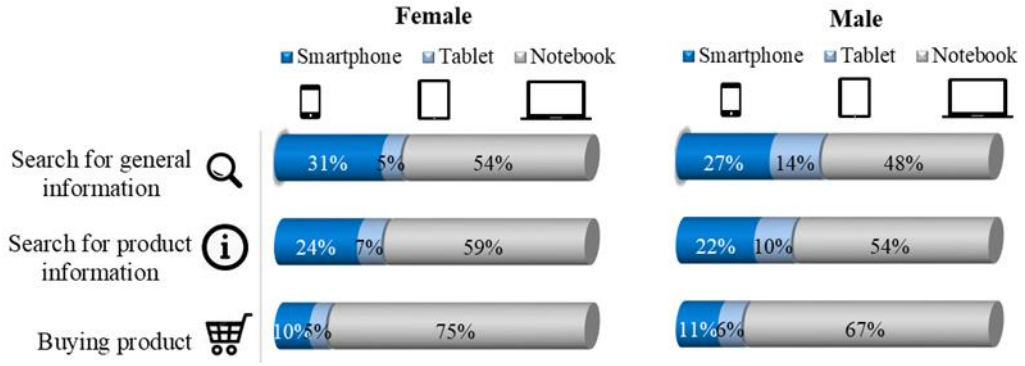

Fig.1. Activities carried out through digital devices
Source: own elaboration

One of our partial goals was to find out which devices buyers use when purchasing online. The results of the analysis show that among the two groups, the notebook is the most preferred one. While it is 60.76% for men, on the contrary, it goes up to 73.44% of women in the online environment through this device. The least preferred digital device is the tablet, less than 15% of women purchase online, and only about a tenth of men. On the contrary, it certainly does not purchase up to 70% of this device. The results of the analysis, among other things, confirm the fact that the traditional desktop computer has moved into the background, and vice versa, the most prominent places are taken by smaller devices. A substantial majority (62-63%) for both genders does not use the desktop to purchase products in the online environment. It can not be claimed that ubiquitous smartphones are the

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most popular online shopping devices, but the results of the analysis show that almost a third of men definitely buy through smart phones. The percentage of women in this case is seven points lower.

The results of the present analysis also point to the fact that, for all men and women, the most used device is still the notebook. However, looking at Chart 2, it may be noticed that the second most preferred device for men is the smartphone (26.58%), while women prefer desktop (23.44%). However, according to Table 2 and Figure 2, it is worth pointing out that after counting the positive answers (4 and 5), we can assert that even for women, the second most frequently used digital device for online purchasing is the smartphone.

Table 2. Device preferences for online purchasing (in %)

Digital device	1-definetly no		2		3		4		5-definetly yes	
	F	M	F	M	F	M	F	M	F	M
Smartphone	59.38	53.16	6.25	3.80	5.47	10.13	9.38	6.33	19.53	26.58
Tablet	63.28	70.89	5.47	1.27	10.16	5.06	6.25	12.66	14.84	10.13
Notebook	14.06	22.78	5.47	2.53	3.13	1.27	3.91	12.66	73.44	60.76
Desktop	63.28	62.03	4.69	2.53	3.91	7.59	4.69	6.33	23.44	21.52

Source: own elaboration

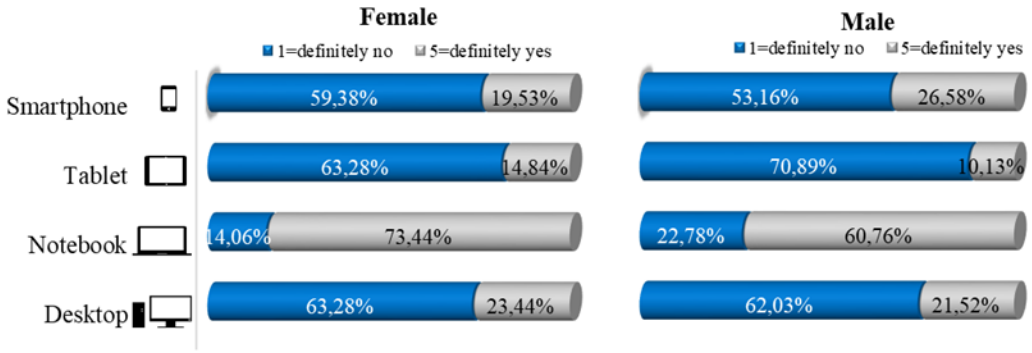

Fig.2. Device preferences for online purchasing from a gender perspective
Source: own elaboration

Continuing the investigation we continued to verify the established hypothesis, to which we used a nonparametric parallel test of parallel profiles. The following Table 3 determines the average and standard deviation values defined to the matter under consideration.

Table 3. Average and standard deviation values for purchasing devices

What kind of digital devices do you use when buying on the Internet?					
Gender		Smartphone	Tablet	Notebook	Desktop
Female	Mean	2.23	2.04	4.17	2.20
	Std. Deviation	1.65	1.53	1.49	1.71
Male	Mean	2.49	1.90	3.86	2.23
	Std. Deviation	1.75	1.48	1.66	1.69
Total	Mean	2.33	1.99	4.05	2.21
	Std. Deviation	1.69	1.51	1.57	1.70

Source: own elaboration

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It cannot be clearly stated from this table that the use of devices for purchasing men's and women's products is really different. Rather, it can be seen that the differences are only minimal. The most frequently used devices are notebooks, which are more common among women. The following Table 4 shows us the results of each test. In the final verification of the hypothesis we decide between:

H0: Gender differences in the use of devices to buy products in the online environment are not statistically significant, deviations are only incidental.
H1: Gender differences in the use of devices to buy products online are statistically significant.

Table 4. Testing parallel profiles for using devices to purchase products

What kind of digital devices do you use when buying on the Internet?					
Testing parallel profiles		Smartphone	Tablet	Notebook	Desktop
	Variable	t1	t2	t3	t4
	RK1t-	1316	1263	1706	1293
	RK2t=	838	757	1012	793
	Vt-	-1.345	1.323	2.205	0.252
	Vcrit.-	2.638			
	pt=	0.089	0.093	0.014	0.401
	pcorrected	0.004			
	sig-	NO	NO	NO	NO

Source: own elaboration

According to this, in all cases the V critical level is higher than the absolute value in the statistical one, so for the hypotheses in t1, ..., t4 we accept the H0 zero hypothesis and we therefore accept the opinion that the gender differences in the use of the devices for purchasing the products in the online environment are not statistically significant.

Conclusions

The most popular interactive medium of the present, Internet, has expanded the perception and character of the economy as a whole. The use of this network has marked all those who have begun to perceive its innumerable possibilities and benefits. With its development, there is also an enormous increase in technology which supports electronic processes, in particular e-commerce and all forms that are inherently associated with it.

The objective of this paper was to identify consumer preferences related to the use of digital devices when searching for product information as well as the online buying process, due to gender differences. In line with the above presented results of the analysis, it can be stated that although smart phones are becoming a regular device for various online activities, Slovak consumers still prefer notebooks. In addition, our survey reveals the fact that the use of digital devices to buy products online is not statistically significant by gender.

Nowadays, when there is no doubt that innovation is synonymous with success, it is crucial to take advantage of all opportunities to strengthen customer relationships, and the real opportunity is to find relevant data which helps marketers focus more accurately on the right group of people.

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References

Androniceanu A.; Burlacu, S.; Drăgulănescu, I.V.; Nicolae, E.E. New trends of businesses digitalization in Romania and the behaviour young consumers", BASIQ International Conference: New Trends in Sustainable Business and Consumption , 31 May-2 June, 2017, Graz, Austria, Proceedings of BASIQ, Vol. 01, pp.27-35, Edited by: Rodica Pamfilie, Vasile Dinu, Laurențiu Tăchiciu, Doru Pleșea, Cristinel Vasiliu; ISBN-ISSN 2457-483X ESI

Bhasker, B. 2013. *Electronic commerce: framework, technologies and applications*. New York: McGraw-Hill Education. https://www.amazon.com/Electronic-Commerce-Framework-Technologies-Applications/dp/9351341674

Buttle, F. 2009. *Customer Relationship Management: Concepts and Technology*. London: Routledge. https://www.routledge.com/Customer-Relationship-Management-Concepts-and-Technologies-3rd-Edition/Buttle-Maklan/p/book/9781138789838

Clemente, M. N. 2004. *Dictionary of Marketing: Key Terms and Terms*. Prague: Computer press. https://www.amazon.com/Marketing-Glossary-Terms-Concepts-Applications/dp/0971943427

Colin, C. 2006. *Introduction to e-Business: Management and Strategy*. Amsterdam: Elsevier. https://www.amazon.com/Introduction-Business-Management-Colin-Combe/dp/0750667311

Curtis, G.; & Cobham, D. 2005. *Business Information Systems: Analysis, Design, and Practice*. London: Pearson Education. https://www.amazon.com/Business-Information-Systems-Analysis-Practice/dp/0273713825

Delina, R.; & Vajda, V. 2008. Theory and Practice of E-commerce. Prešov: Grafotlač Prešov. https://exclusiveejournal.sk/files/files/13/23/84/cc6c4f65a3fb4cc0ad311b667a6aa63c/cc6c4f65a3fb4cc0ad311b667a6aa63c.pdf

Bačík, R.; Szabo, Z. K.; & Fedorko, R. 2014. The analytical insight into customer perception of quality determinants of the e-commerce model B2C subjects in the central European countries, *Quality Innovation Prosperity* 18(2): 15-26. http://dx.doi.org/10.12776/qip.v18i2.316

Gavurová, B.; Virglerová, Z.; & Janke, F. 2017. Trust and a Sustainability of the macroeconomic growth Insights from dynamic perspective, *Journal of Security & Sustainability Issues* 6(4): 637-648. https://doi.org/10.9770/jssi.2017.6.4(9)

Govindaraju, R.; & Chandra, D. R. 2011. E-commerce adoption by Indonesian small, medium, and micro enterprises (SMMEs): Analysis of goals and barriers. *Communication Software and Networks (ICCSN), 2011 IEEE 3rd International Conference, ICCSN 2011*. May 27-29, art. no. 6014861, Xi'an, China, 113-117. https://doi.org/10.1109/ICCSN.2011.6014861

Hajli, M. N. 2014. A study of the impact of social media on consumers, *International Journal of Market Research* 56(3): 387-404. https://doi.org/10.2501/IJMR-2014-025

Chaffey, D.; Ellis-Chadwick, F.; Mayer, R.; & Johnston, K. 2009. *Internet marketing: strategy, implementation and practice*. London, Pearson Education. https://www.amazon.co.uk/Internet-Marketing-Strategy-Implementation-Financial/dp/0273717405

Chromý, J. 2009. Electronic Business. Prague: Institute of Hospitality Management in Prague. http://www.extrasystem.com/9788087570111.pdf

Kotler, P. et al. 2007. Modern marketing. Prague: Grada Publishing.

Lawson, J. 2015, April 13. What is Ecommerce anyway? *Webretailer*, retrieved from http://www.webretailer.com/lean-commerce/what-is-ecommerce

Liang, T. P.; & Turban, E. 2011. Introduction to the special issue social commerce: a research framework for social commerce, *International Journal of electronic commerce* 16(2): 5-14. https://doi.org/10.2753/JEC1086-4415160201

Manzoor, A. 2010. *E-Commerce: An Introduction*. Saarbrücken: LAP LAMBERT Academic Publishing. https://www.amazon.com/Commerce-Introduction-Amir-Manzoor/dp/3843370303

Mueller, J.; Hutter, K.; Fueller, J.; & Matzler, K. 2011. Virtual worlds as knowledge management platform–a practice-perspective, *Information Systems Journal* 21(6): 479-501. https://doi.org/10.1111/j.1365-2575.2010.00366.x

Park, D. H.; Lee, J.; & Han, I. 2007. The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement, *International journal of electronic commerce* 11(4): 125-148. https://doi.org/10.2753/JEC1086-4415110405

Pogodina, T.V.; Aleksakhina, V.G.; Burenin, V.A.; Polianova, T.N.; Yunusov, L.A. 2019. Towards the innovation-focused industry development in a climate of digitalization: the case of Russia, *Entrepreneurship and Sustainability Issues* 6(4): 1897-1906. http://doi.org/10.9770/jesi.2019.6.4(25)

Raudeliūnienė, J.; Davidavičienė, V.; Tvaronavičienė, M.; Radeckytė, V. 2018. A study of success factors of women's leadership in e-commerce, Terra Economicus, 16(3):120-138 https://doi.org/10.23683/2073-6606-2018-16-3-120-138

Schneider, G. 2011. *E-business*. Boston: Cengage Learning. https://www.amazon.com/Electronic-Commerce-Gary-Schneider/dp/128542543X

Šoltés, V.; & Gavurová, B. 2010. Modification of performance measurement system in the intentions of globalization trends, *Polish Journal of Management Studies* 11(2): 160-170. https://pjms.zim.pcz.pl/resources/html/article/details?id=167342

Stefko, R.; Habanik, J.; & Butoracova-Sindleryova, I. 2010. Marketing Instrumentary in the Process of Project Acceptation within the Acceleration of Back-warded Regions Development, *Ekonomicky Casopis* 5(58): 512-526. https://www.infona.pl/resource/bwmeta1.element.a4524950-9fa3-36f3-9634-9fcfe40e6dd1

Tian, Y.; & Steward, C. 2008. *History of E-Commerce*. Hershey: Idea Group Inc. http://www.irma-international.org/viewtitle/9447/

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EFFICIENT PORTOFOLIO COMPOSITION OF INDONESIAN ISLAMIC BANK FINANCING

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Abstract. The purpose of this research is to determine the composition of an efficient portfolio in the financing of ten Islamic banks. The theory of efficient portfolio by Markowitz is a modern portfolio theory used for analyzing the combination of various investment instruments to form efficient portfolio points at efficient frontier lines. The efficient composition portfolio measurement of Islamic bank in this study uses return, standard deviation, variance-covariance, correlation coefficient, and variation coefficient of investment instruments between 2011 and 2015. This study uses quantitative research achieved using Microsoft Excel. The result of this research shows that the average composition of an efficient portfolio of each Islamic bank is as follows: 48.62% for Mudharabah-Musyarakah, 41.63% for Murabahah, 8.03% for Ijarah, and 8.31% for Istishna. It can be seen that Mudharabah-Musyarakah and Murabahah are more dominant than the other financing types.

Keywords: return; standard deviation; efficient portfolio; efficient frontier; Indonesia

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1. Introduction

Financing is an important function of all financial institutions and can be used as a source of income for Islamic banks. In performing its functions, it is important that Islamic banks pay attention to the ratios that affect the quality of financing. As quoted from the Islamic Finance Outlook in 2015, the Financing to Deposit Ratio (FDR) for Islamic banks remained above 96%, when compared to conventional banks which remained between 60 to 90%. Further, of the third-party funds received by Islamic banks, 96% of it was channeled for financing. However, the various financing issues faced by Islamic banks are largely caused by the Non-Performing Financing (NPF) ratio, which typically sits between 2% and 4%. According to Obaidullah (2015), there are three types of Islamic financing: equity based financing, debt-based financing and service-based financing. Table 1 demonstrates that the *Murabahah* bank is the most preferred Islamic bank in Indonesia.

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The provision of finance is a banks' most important function when it comes to earning profit, however, financing also exposes banks to different types of risk. In order to reduce the risks associated with financing, Islamic banks need to employ a meaningful diversification regime. Banks need to establish a wide-ranging portfolio, through the selection of a combination of assets so as to reduce risk without reducing the return, or the rate of return, received.

Table 1. Islamic Financing Instrument Portion in Islamic Banking Industry
(In percentage)

Year	Mudharabah	Musyarakah	Murabahah	Ijarah	Istishna
2011	18.46	9.96	54.90	0.31	3.73
2012	18.75	8.15	59.66	0.25	4.97
2013	21.65	7.39	60	0.31	5.69
2014	24.74	7.42	59.23	0.33	4.94
2015	27.74	7.32	57.96	0.38	4.49

Source: Statistics of the Financial Services Authority in December 2015, taken from www.ojk.go.id , reprocessed

As financial institutions, Islamic banks have the power to determine the amount of finance provided in accordance with the risk associated with each transaction, whilst complying with the rules set by the Financial Services Authority. It is important for Islamic banks to employ policies within their business to determine the composition of their finance portfolio, in a way that offers high returns with certain risks or low returns with low risks. This is known as an efficient portfolio. In order to achieve an efficient finance portfolio, Islamic banks must collect important information about the characteristics of assets which will be included in the portfolio, such as the expected returns, the risk involved and the proposed benefit to the bank. The research question addressed in this paper explores how to create an efficient portfolio in Islamic banks.

2. Theoretical Framework

2.1. Islamic Financing Instrument

There are five types of financing used in this research, namely *Mudharabah* financing, *Musyarakah* financing, *Murabahah* financing, *Ijara* financing and *Istishna* financing. *Mudharabah* financing is a fund investment transaction from the *Shahibul Maal* (owner of the fund) to the *Mudharib* (fund manager) to conduct certain Islamic-compliant business activities, with shares being held in the company by the two parties, based on the *nisbah* (ratio) agreed beforehand (Obaidullah 2015: 41).

Alternatively, *Musyarakah* financing is a form of business which involves two or more parties combining all forms of tangible and intangible resources. The parties provide contributions in the form of funds, trade goods, entrepreneurship, intelligence, ownership, equipment and other non-monetary goods (Karim, Adiwarman 2007: 102).

Murabahah financing is an *akad* (contract) for the purchase and sale of goods, which states the price of acquisition and profit (margin) as agreed by the seller and buyer (Karim, Adiwarman 2007: 113). *Istishna* financing is an *akad* of sale and purchase in the form of ordering certain goods with certain criteria and requirements, as agreed between the one who ordered (buyer, *mustashni'*) and the seller (maker, *shani'*) (DSN-MUI Fatwa). The last is *Ijarah* financing, which is an *akad* for transferring the right to use certain goods or services within a certain time through the payment of rent /wages, without the ownership of the goods themselves being transferred.

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2.2. Efficient Portofolio Theory and Optimum Portfolio

Jones (2000) states that an efficient portfolio is a portfolio with the same level of profit and a lower risk, or with the same risk that provides a higher rate of return. Unlike an efficient portfolio, an optimum portfolio is a portfolio that an investor chooses from many options that exist in an efficient portfolio set. Surely, the portfolio selected by investors in this case is the portfolio of an Islamic bank in accordance with the preference of investors. When creating an investment portfolio, investors always seek to maximize their expected return, whilst leveraging that on a certain level of risk, often looking for a portfolio that offers the lowest risk and a certain amount of RoR (Pirzada 2017; Aktan et al. 2018). This particular portfolio is called an efficient portfolio. To establish an efficient portfolio, we must assume the behavior of investors in making investment decisions. One of the most important assumptions is that no investor likes excessive risk (risk aversion). Meanwhile, investors are more likely to choose an optimal portfolio from the efficient portfolio (Marcowitz 1991).

2.3. Risk and Return Portfolio Theory

Risk–return portfolio theory is commonly used in finance to analyze the RoR and the expected return of one instrument and set of instruments; in this case, the instrument is the finance provided by Indonesian Islamic banks. Moreover, it may also inform the probability of occurrence of an instrument and coefficient of correlation, as two of the pre-requisite elements are used to calculate risk and return of one and group of the financing instrument(s).

This paper uses the risk-return portfolio theory to identify the risk of a financing instrument using the variance of actual and expected return. Following this, the risk of various financing instruments are also identified from the variance of actual and expected return (Ismal, 2008, 2010, 2014; Chen, Yuan 2016; Kunitsyna et al. 2018).

3. Research Methodology

This research uses a quantitative approach using the Markowitz model portfolio which is processed using Microsoft Excel and the Solver application. The operational definition of the research variables are as follows (Table 2) (Horne, 2001)

Table 2. Research variables

EQUATION	NOTES
1. Individual Return Realization: $Actual\ Return = \frac{Amount\ of\ earned\ income}{Amount\ of\ financing\ issued}$	
2. Individual Expected Return: $E(R_j) = \frac{\sum R_j}{n}$	$E(R_j)$ = expected rate of return from j financing R_j = actual rate of return from j financing n = amount of possible occurring event
3. Portfolio Expected Return $E(R_i) = \sum_{i=1}^{n}(W_i E(R_I))$	$E(R_i)$= the rate of expected return of the portfolio W_i= the proportion from asset *i* towards the whole portfolio asset $E(R_I)$= the rate return of each asset *i* n= number of single securities
4. Individual Standard Deviation	σ= standard deviation $E(R_j)$= the rate of financing actual return

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$\sigma = \sqrt{\frac{\sum_{i=1}^{n}[R_{ij} - E(R_j)]^2}{n-1}}$	R_{ij} = average rate of financing expected return n= total historical data observation for large sample with n (at least 30 observations) and for small sample (n-1)
5. Portfolio Standard Deviation $\sigma_{(p)}^2 = \sqrt{\sum_{i=1}^{n} W_i^2\sigma_i^2 + \sum_{i=1}^{n}\sum_{j=1}^{n} W_i W_j Cov(R_i, R_j)}$	$\sigma_{(p)}^2$= the variance of portfolio profit W_i= invested fund proportion to asset *i* W_j= invested fund proportion to asset *j* σ_i^2= the variance of profit asset *i* $Cov(R_i, R_j)$= covariance of asset *i* and asset *j*
6. Covariance $Cov(R_A, R_B) = \sigma_{AB} = \frac{\sum_{i=1}^{n}[R_{A,i} - E(R_A)[R_{B,j} - E(R_B)]}{n}$	σ_{AB}= covariance between security A and B $R_{A,i}$= A return securities of *i* $R_{B,j}$= B return securities of *j* $E(R_A)$= expected return of security A $E(R_B)$= expected return of security B n= total historical data observation for large sample (at least 30 observations) and for small sample (n-1)
7. Correlation Coefficient $\rho_{i,j} = \frac{Cov(r_i, r_j)}{\sigma_i \sigma_j}$	$\rho_{i,j}$= correlation coefficient between security i and *j* $Cov(r_i, r_j)$= covariance between security i and *j* σ_i= standard deviation security *i*

To establish an efficient portfolio, this research uses the Microsoft Excel spreadsheet application. The researcher uses a feature in Microsoft Excel named Solver that can be used to search for the most efficient combination of variables whose size is unknown, by determining limitation or certain constraints first. The limitation or constraints conducted in establishing an efficient portfolio are as follows:

a. Minimize portfolio risk.
b. Proportion size for each investment is more than or equal to zero.
c. The total weighted average for each type of financing is 100%.
d. Size of certain returns, starting from the type of investment that results in the smallest to largest return.

The population in this research is Islamic banks in Indonesia. According to the data collected by the Bank of Indonesia in 2015, there are currently 12 Islamic banks. This research uses purposive sampling as the sampling technique. Researchh Sample is presented in Table 3.

The criteria of this research selection samples are as follows:

i. Islamic banks which operated in Indonesia between 2011 and 2015.
ii. Banks with a financial report published between 2011 and 2015.
iii. Islamic banks with completed data based on the examined variables.

Table 3. Research Sample

Names of Islamic Banks	
Bank BNI Syariah	Bank Muamalat Indonesia
Bank Bukopin Syariah	Bank Jabar Syariah
Bank Panin Syariah	Bank Syariah Mandiri
Bank BCA Syariah	Bank Victoria Syariah
Bank BRI Syariah	Bank Mega Syariah

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4. Result and Discussion

4.1. Description of Research Results

4.1.1. Calculating of Average Return and Standart Deviation

The calculation of the average return and standard deviation of the finance activities of the *Mudharabah Musyarakah*, *Murabahah*, *Ijarah*, and *Istishna* banks of Muamalat, Indonesia is calculated using quarterly financial statements for the period of 2011-2015. The data that has been used is financing data and financing income. The results of the actual return expected return and standard deviation are shown in Table 4.

Table 4. Average Return and Standard Deviation

Bank	MEAN				St.Dev			
	Mudharabah-Musyarakah	Murabahah	Ijarah	Istishna	Mudharabah-Musyarakah	Murabahah	Ijarah	Istishna
BMI	0.09	0.99	0.12	0.11	0.18	0.02	0.16	0.06
BRIS	0.09	0.12	0.50	0.14	0.02	0.02	1.44	0.08
BSM	0.11	0.10	0.76	0.09	0.01	0.02	0.84	0.05
BJBS	0.11	0.11	0.29	0.13	0.02	0.03	0.28	0.39
BCAS	0.08	0.08	0.38	-	0.03	0.03	0.24	-
BNIS	0.09	0.11	0.15	-	0.01	0.02	0.14	-
BVS	0.07	0.10	0.67	-	0.07	0.05	0.82	-
BSB	0.10	0.10	0.09	-	0.04	0.01	0.05	-
BPS	0.09	0.10	-	-	0.02	0.05	-	-
BMS	0.12	0.18	-	-	0.10	0..04	-	-

Table 4 shows that the average return of financing at Islamic banks has various values. It also shows that *Ijarah* financing has the highest return compared to the other financing types. Whether a return rate is high or low is inseparable from the contained risk rate. It is shown that *Ijarah* financing produces the highest return however, it also has the highest risk. The supports the concept of high risk and high return.

4.1.2. Establishment of an Efficient Portfolio Composition

After obtaining the average value of returns, standard deviation, correlation, and the covariant of all types of finance options, an efficient portfolio combination can be established by using the Solver application. The result of that calculation are presented in Table 4. The results show that *Ijarah* financing has the smallest proportion compared to the other financing, although the return of *Ijarah* financing in Islamic banks is the highest. This is likely the result of using the Markowitz theory of efficient portfolio which focuses only on risk and return, whilst ignoring other factors.

The extreme fluctuation on returns experienced by *Ijarah* financing, ranging between the highest and lowest level, suggests that the higher the risk, the higher the average return will be compared to the other types of investments. In establishing an efficient portfolio, *Ijarah* financing must be reduced into the lowest proportion.

However, the highest proportion is found in *Murabahah* financing. *Murabahah* financing is able to minimize the risk involved by determining the margin in the beginning of the contract by the Islamic bank. This provides the Islamic bank with certainty of income. In addition, *Murabahah* financing does not require much effort and coordination when compared to *Mudharabah-Musyarakah* financing. Hence, the results of the Markowitz's portfolio theory assume that the risk is still low. This is also emphasized by the average return of *Murabahah*

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financing, which is relatively stable, and does not fluctuate a great deal. Hence, it is assumed that the deviation of reaching the expected return is small.

Table 5. Efficient Portfolio Composition of Each Islamic Banks

Bank	Std.Dev	E[r]	Mudharabah-Musyarakah	Murabahah	Ijarah	Istishna
BMI	1.48%	10.24%	34.41%	39.85%	6.85%	18.89%
BRIS	2.88%	12.32%	9.61%	83.57%	1.00%	5.83%
BSM	1.71%	11.72%	92.05%	1.00%	1.19%	5.76%
BJBS	2.14%	12.55%	67.83%	21.86%	7.54%	2.77%
BCAS	2.73%	10.27%	45.48%	48.95%	5.57%	-
BNIS	1.29%	10%	83.45%	11.08%	5.47%	-
BVS	4.27%	12.2%	14.08%	82.34%	3.58%	-
BSB	1.45%	10%	28.28%	38.69%	-	33.03%
BPS	2.47%	9.30%	98.88%	1.12%	-	-
BMS	4.43%	18.08%	12.16%	87.84%	-	-

4.2. Efficient Frontier Curve

After identifying the combination of portfolio proportions, that combination is plotted into the graph in which the X axis (horizontal) is the standard deviation and the Y axis (vertical) is the expected return on the portfolio. If the points which are the combination of the investment portfolio are linked, they will form a curve called an efficient frontier curve, as shown in Figure 1.

This study assumes that investors are rational and risk averse and hence will choose a portfolio with a higher return when compared to the risk involved. Therefore, a portfolio which is plotted under an efficient portfolio point in an efficient frontier curve of each bank is a non-efficient curve. Conversely, a portfolio which is laid above an efficient portfolio point in an efficient frontier curve of each bank is an efficient frontier.

As shown in the efficient frontier curve of the 10 Islamic banks, excluding Bank Mega Syariah, all of the banks share the same convex upward curve. This is consistent with Markowitz's theory that the higher the rate of return is expected to increase, then the higher the risk that the investors will be willing to take, i.e., high risk and high return. Compared to the other banks, the curve shape of the Bank BRI Syariah is more linear, while the curve shape of the Bank Syariah Bukopin is more convex. This is because the correlation of the return rate of the Bank BRI Syariah has a positive correlation, and the correlation of the return rate of the Bank Syariah Bukopin has a negative correlation. This is different from the Bank Mega Syariah, which has convex-to-the-bottom-right efficient frontier curve, as shown in Figure 1. This demonstrates that the portfolio status is not more efficient. This may be due to the number of bad debts reflected in the NPF ratio on the Bank Mega Syariah. This produces an efficient frontier curve for the Bank Mega Syariah, which is different from the other Islamic banks.

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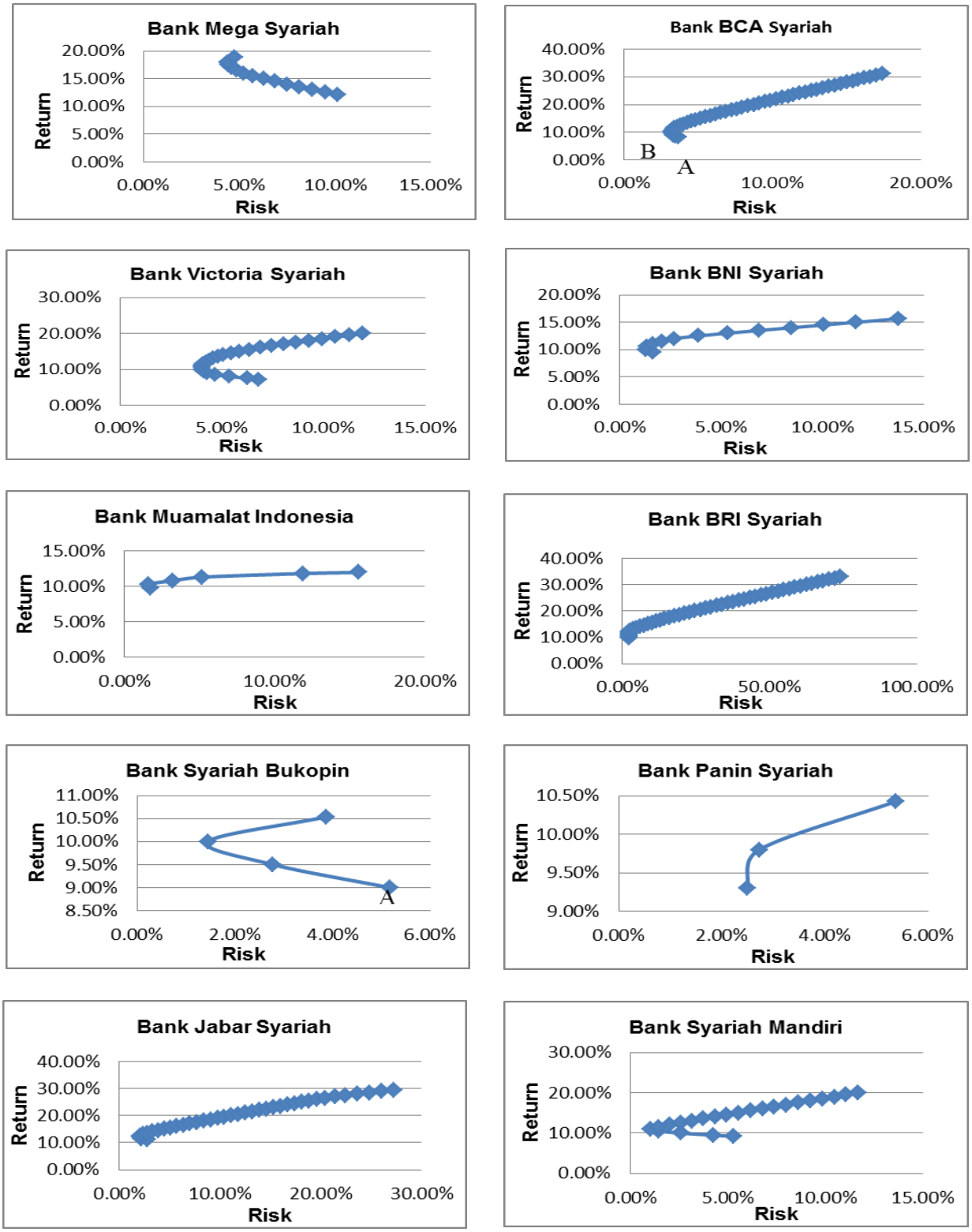

Figure.1. Frontier Efficient Curves of Islamic Banks

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5. Discussion

5.1. Efficient Portfolio Target

In essence, portfolio management consists of three main activities: (1) making a decision of asset allocation, (2) determining the portion of funds which will be invested in each asset class, and (3) choosing assets from each selected asset class. In Markowitz's portfolio model, portfolio selection consisting of individual assets is used. The individual assets used in this research are *Mudharabah-Musyarakah*, *Murabahah*, *Ijarah*, and *Istishna* financing, which exist in each Islamic bank.

The aim of making a portfolio is to diversify the risk within a portfolio, to achieve a portfolio with the lowest risk, or to obtain a combination of high returns with low risk. The creation of a portfolio in this research aims to achieve the lowest risk, which is chosen by the standard deviation, or the lowest variance. The portfolio with this lowest risk is called the minimum variance portfolio (MVP).

This section will describe the target of an efficient portfolio from an efficient set based on 10 Islamic banks as shown in Table 5. This demonstrates that the Bank Muamalat Indonesia will achieve an efficient portfolio with a risk rate of 1.48% and a return rate of 10.24%, which represents a proportion of 34.41% of *Mudharabah-Musyarakah* financing, 39.85% of *Murabahah* financing, 6.85% of *Ijarah* financing, and 18.89% of *Istishna* financing. The same thing occurs in the Bank Jabar Syariah, which will achieve an efficient portfolio if it employs 67.83% of *Mudharabah-Musyarakah* financing, 21.85% of *Murabahah* Financing, 7.54% of *Ijarah* financing and 2.77% of *Istishna* financing with a portfolio return of 12.55% and a portfolio risk of 2.14%.

From the results shown in Table 5, it can be seen that the average financing of *Mudharabah-Musyarakah* from each of the Islamic banks is 48.62%, *Murabahah* financing is 41.63%, *Ijarah* financing is 8.03%, and *Istishna* financing is 8.31%. This shows that *Mudharabah-Musyarakah* financing and *Murabahah* financing are more common than *Ijarah* financing and *Istishna* financing.

6. Conclusion

Based on the results of the analysis and discussion, it can be concluded that every kind of Islamic bank financing in Indonesia requires a different composition in order to provide finance options with minimum risk. However, the average financing of *Mudharabah-Musyarakah* is higher than the other types. Therefore, it is important for banks to pay more attention to the expansion of investments and consider using more *Mudharabah-Musyarakah*. In addition, risk mitigation is important to consider when dealing with high risk financing, particularly with respect to *Ijarah* financing. This can be achieved by monitoring the concentration of finance portfolios, focusing on the most interesting and rapidly developing industrial sectors in Indonesia and developing organizational structures that are providing the finance to these sectors.

This study calculates the composition of an efficient portfolio for each Islamic bank between 2011 and 2015. The results show that the average of *Mudharabah-Musyarakah* financing from each Islamic bank is 48.62%, *Murabahah* financing is 41.63%, *Ijarah* financing is 8.03 % and *Istsihna* financing is 8.31%.

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References

Acharya, V. V.; Saunders, A.; Iftekhar, H. 2002. *"Should Banks be Diversified?".* BIS Working Papers. http://dx.doi.org/10.2139/ssrn.293295

Ali, Salman Syed. 2005. "*Islamic Capital Market Products: Developments and Challenges"*. Islamic Research and Training Institute. Occasional Paper No. 9. ISBN 978-9960-32-179-0 https://www.isfin.net/sites/isfin.com/files/islamic_capital_market_products-_developments_and_challenges.pdf

Aktan B.; Turen S.; Tvaronaviciene M.; Celik S.; Alsadeh H.A. 2018. Corporate governance and performance of the financial firms in Bahrain, *Polish Journal of Management Studies* 17(1): 39–58. https://doi.org/10.17512/pjms.2018.17.1.04

Chen, J.; Yuan, M. 2016. Efficient Portfolio Selection in a Large Market, *Journal of Financial Econometrics* 14(3): 496–524. https://doi.org/10.1093/jjfinec/nbw003

Guerard, J. B., Markowitz, H, Xu, G. 2013. Global Stock Selection Modeling and Efficient Portfolio Construction and Management, *The Journal of Investing* 22(4): 121-128. https://doi.org/10.3905/joi.2013.22.4.121.

Horne, J. 2001. Fundamental of Financial Management: 12th Edition. ISBN 978-979-691-266-3. https://www.amazon.com/Fundamentals-Financial-Management-James-Horne/dp/8120338979

Ismal, R. 2008. *"The Potential of Liquidity Risk in Islamic Banking".* Academic Paper, Presented in Ustinov College Seminar of Finance, Durham University. http://etheses.dur.ac.uk/550/

Ismal, R. 2014. An Optimal Risk – Return Portfolio of Islamic Bank, *Humonomics*, 30(4): 286-303. https://doi.org/10.1108/H-08-2013-0055.

Ismal, R. 2010. *The Indonesian Islamic Banking (Theory and Practices)*. Bogor: Phd Gramata Publishing. ISBN 978-602-8986-20-6. http://malcat.uum.edu.my/kip/Record/ukm.vtls003587975

Jones, Ch. P, 2000. Investment: Analysis and Management, Tenth Edition. New York: John Willey and Sons.Inc. ISBN 0471-331-14-7. http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0471456667&itemTypeId=BKS&bcsId=1720

Karim, A. Adiwarman. 2007. Islamic Microeconomics. Second Edition. Jakarta: PT. Raja Grafindo Persada. ISBN 97-8979-697-38-9

Kunitsyna, N.; Britchenko, I.; Kunitsyn, I. 2018. Reputational risks, value of losses and financial sustainability of commercial banks, *Entrepreneurship and* Sustainability *Issues* 5(4): 943-955. http://doi.org/10.9770/jesi.2018.5.4(17)

Marcowitz, H.M. 1991. Foundations of Portfolio Theory, *Journal of Finance Teknik Perhitungan Bagi Hasil di Bank Syariah*. Yogyakarta: UII Press. ISBN 979-841-369-5.

Obaidullah, M. 2015. "*Islamic Financial Services".* Islamic Economics and Research Center, King Abdul Aziz, University Jeddah, Saudi Arabia. ISBN 978-9960-064-28-4.

Pirzada, K. 2017. Effects of Dividend Policy on Stock Price Volatility in the Financial Sector, *Journal of Finance and Banking Review* 2(2): 34-48. ISSN 0128-3103. http://gatrenterprise.com/GATRJournals/effects_of_dividend_policy_on_stock_price_volatility_in_the_financial_sector.html

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MULTIFACTOR ON MACROECONOMIC FUNDAMENTALS TO EXPLAIN THE BEHAVIOR OF SECTORAL INDICES IN THE INDONESIAN STOCK EXCHANGE

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Abstract. The purpose of this study is to investigate the impact of macro-fundamentals using factor approach on sectoral indices in the Indonesian Stock Exchange. This study uses monthly data on the returns of sectoral indices and uses Seemingly Unrelated Regression (SUR) analysis with a multifactor model. The results show that macro-economic variables can be classified into 2 common factors; Monetary Macro Factor (MMF) and Real Macro Factor (RMF). These factors have varying effects on different sectoral indices. Due to differences in the characteristics embodied in each sector, sectors then respond differently towards the change in macroeconomic conditions in Indonesia. The MMF is dominated by variables such as BI Rate, inflation, and exchange rates, while the MRF is influenced by other variables such as foreign exchange reserves, exports, and Indonesian crude oil prices. The MMF negatively affects indexes such as basic industry and chemical, consumer goods, infrastructure, manufacturing, mining, miscellaneous industries and property and trade, while the RMF has negative effect on the mining sector. By applying regression and Principal Components approaches, the model provides higher predictive power for the price behavior in each sector. This study found that the real sector is as important as the financial sector in influencing the capital market. This demonstrates a strong connection between the real and the financial. It also shows that the Indonesian capital market is dominantly controlled by investors rather than speculators. This is of particular importance for researchers who may be considering conducting a comparison of multifactor models and other methods such as CAPM and the Five Factor Model of Fama and French.

Keywords: macroeconomic; sectoral indices; macro-fundamental; factor approach; multifactor; model of Fama and French

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JEL Classifications: G11, E44

1. Introduction

Macro-economics has a complicated impact on capital market. Abundantly macro variables have both direct or indirect effects on the capital market any given country. This impact can be investigated in terms of the change in returns (Angelidis et al. 2015; Aissia 2016, Bouri et al. 2016; Masood et al. 2019). Changes in returns is one of the primary concern of investors. In the midst of uncertain economic conditions, investors are likely to seek to

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secure the potential of their assets, and consider how to take advantage of their assets in order to remain valuable for the long term (Hung et al. 2014, Bouri 2015, Couch and Wu 2016). One kind of investment is trading in the capital market. Capital markets have an important role in the economy such as being a source of funding for businesses and for investment. People can invest in available financial instruments such as stocks, bonds and mutual funds. This allows the public to put its own funds into corporations based on the benefits and risks of different instruments.

It is generally accepted that macroeconomic conditions and the performance of capital markets have a strong relationship. Capital markets can be used to describe macro-economic conditions as they have an effect on investment value. In 2008, during the global financial crisis, the Indonesian economy was weakened by high inflation rates at 11%, followed by the weakening of capital market conditions as described by JCI (Jakarta Composite Index) to a value of 1,355 points. In 2009, after the crisis, the economic conditions in Indonesia improved, followed by an increase in the JCI (Jakarta Composite Index). This phenomenon shows how macroeconomic conditions relate to capital markets.

In a Top-Down Portfolio approach in an investment decision, it is not only macroeconomic conditions, but the condition of sectors that is of concern. In a sectoral analysis, investors can compare the performance of various sectors, in order to know which sectors have good prospects for investment. There are 10 sectors in the Indonesian stock market that can be used for investment purposes: agriculture, mining, basic industry, miscellaneous industries, consumer goods, property, infrastructure, finance, trade and services, and manufacturing. After conducting an industry analysis, investors can use that information as a strategy to choose which sectors will be included in the portfolio to be formed. The macroeconomic condition and the condition of each sector inside are interlinked and interdependent on one another; both can affect the performance of a company. A company's performance can also affect the price of stocks and of various sectors.

Research on the effect of macroeconomic factors on sectoral indices has been investigated by Hasan et al. (2015) to determine the effect of macroeconomic factors such as GDP growth, the growth of money supply, inflation and interest rates of index return of 10 sectors in Bangladesh. The results of this research show that all of the macroeconomic variables investigated have an affect on the financial sector but not the real one. This means that macroeconomic variables do not have an affect on the investment sector, engineering sector, garment, paper and production, services, insurance and miscellaneous industries. Further, inflation and interest rates have an affect on the food sector and the sector of medicine and chemistry (Bekiros and Gupta 2015).

Abnormal returns often occur in the stock market and are very important for investment purposes. Abnormal returns occur due to the delivery of the information that causes market anomalies. Based on the random walk theory, stock prices move randomly and in an unpredictable manner. In an efficient market, the information disseminated by the market will respond quickly and rationally, so it is possible that the emergence of anomalies will result in abnormal returns. In an efficient market however, there is no “over information”, because the market price is formed based on all the information. In an efficient market, the seasonal pattern of returns that can be predicted by the investor should not occur; this is against the empirical theory of efficient markets. that states “no one can beat the market” (Tandelilin 2001: 111). The conditions that cannot be predicted with any paradigm or empirical theory in the stock market are known as market anomalies. In other words, a market anomaly is a symptom of irregularities or inconsistencies in the capital market hypothesis. This theory does not apply to the real sector. Therefore, it seems that the real and the financial sectors are very dissimilar (Apergis, N, 2015). This encourages research on how capital market price behavior is related to both sectors.

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2. Literature Review

Capital markets are a market for a variety of long-term financial instruments that can be traded, either in the form of debt or equity capital (Husnan, 2003: 3). Capital is an important element in the production process. It is the accumulation of net investment, while investment is a commitment to sacrifice current consumption to increase consumption in the future (Tandelilin, 2010). Investment can be associated with save funds on real assets such as land, gold, houses and other real assets. Alternatively, it can take the form of financial assets such as deposits, stocks, bonds, and other securities. Stock is one type of investment instrument in capital markets. Investment in stocks is more advantageous compared to other instruments. The Indonesian capital market is growing each year, supported heavily by foreign investors due to the long term prosperity outlook of the Indonesian market (Aissia, D. B., 2016).

Before investing in any stock market, investor must conduct an analysis of the stock to obtain much information that will be used for their investment. Technical and fundamental analyses are used in this process. Fundamental analysis involves various factors such as the performance of the company, and all related macroeconomic variables that arguably influence prices. It also covers very wide areas as well as small or micro areas, from international economic condition such as the global economic situation, regional or country perspectives or even sectoral perspectives, right up to the management of a firm and its business conditions as shown by various financial ratios. At this stage, investors see macroeconomic conditions and the condition of the capital market as a whole and apply it in a Top Down strategy for investment decisions when selecting country for investment. Investors also conduct thorough analysis to determine which sectors and firms provide the best investment options. According to Tandelilin (2001), a company's prospects are highly dependent on the economy as a whole, hence, in stock valuation analysis, investors should pay close attention to macro variables that may affect the company's ability to generate profits. Macroeconomics may also affect the daily activities of the company, and the impact of this will have an overall affect on the performance of each company. Similarly, the economic conditions of each sector may influence the performance of the firms within each sector. Overall, these factors influence the sectoral indices and the JCI.

Interest rates are an important macro-economic variable affecting capital markets. High interest rates may reduce the present value of future cash flows, ultimately decreasing the attractiveness of investment. Higher the interest rate, in this case BI rate as the benchmark of interest rates, may lead investors to move their funds to invest in savings accounts or deposits. An increase of the BI Rate level influences the bank interest rates, and in particular deposits may increase, which will influence investors to invest in banks rather than in the stock market.

Foreign exchange reserves may also affect the stock price index. Foreign exchange reserves is the measurement of a country's level of income. If a country's foreign exchange reserve is high, the income received by these countries is also high. Foreign exchange reserves are closely related to the balance of payments. When the balance of payment is in surplus, this will be a positive sentiment for investors. Investors are keen to invest in the capital market because the economic conditions of capital markets are typically stable. Exports of certain sectors in an economy may affect the stock price of that sector. Thus, the balance of trade as well as the balance of payment have an affect on the capital market. When there is a trade balance deficit, it becomes a negative signal for investors and vice versa. When the amount of exports increases, this will be positive sentiment for investors.

Indonesia's crude oil price, for instance, may affect the stock price index. Crude oil is one of the sub-sectors of the mining and mineral sector. When crude oil prices increase, the stock prices of the mining sector will increase. This will increase the stock prices in that sector and this will attract investors. Hence, the increase in crude oil prices is a positive sentiment for investors, in particular for mining stocks.

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In a fundamental approach, the inflation rate is of primary concern as this may negatively affect stock prices. Inflation is the result of investors becoming pessimistic about the ability of capital to generate profits in the future. Inflation will cause a decrease in the profitability of companies, which will also have a negative effect on stock demand, which necessarily causes a decline in stock price.

Exchange rates, theoretically, may also affect stock prices because the stronger or weaker a currency is, the greater effect it will have on investors' willingness to invest in that currency. The strengthening of Rupiah against US dollar, for example, is a positive signal for the Indonesian economy, and will likely lead to an increase in foreign investment in Indonesia. For developing countries such as Indonesia, when exchange rates continue to grow, this will reduce importation costs, particularly the cost of importing raw materials. This will cause a decrease in production costs and push profits up. This causes an increase in dividends.

Market anomalies are a technique or strategy that seems to contradict the phenomenon of efficient markets. Some examples of anomalies include: fundamental anomalies, calendar anomalies, momentum and overreaction anomalies and the anomaly of Initial Public Offerings (IPO anomalies). Calendar anomalies is one anomaly in the time series of anomalies because it creates abnormal returns in certain periods. Calendar anomalies include the weekend effect, the holiday effect, the monthly effect and others.

Pujiharjanto (2010) states that the monthly effect is one of the calendar anomalies that occurs due to the returns in one or several months being larger than in other months. The existence of a market anomaly in a stock market shows that the condition of stock markets are not completely efficient.

The theory of anomalies tends to be neglected in real or production sectors. With the exception of the agricultural sector, which mostly relies on climate, all others tend to be stable in production year long. It seems that the real sectors are more likely to be characterized by technical relationships, while financial capital markets are influenced by emotional and social relationships. Since each sector in an economy has different characteristics, their relationship with the real and financial sectors could be different. Some factors will be more aligned with the financial sectors while others will be more aligned to the real sector, or there may be a balance between the two.

3. Method

This research investigates the effect of macroeconomic factors to sectoral stock price indices in the Indonesian Stock Exchange, using monthly data from 2007 to 2017. The data type is secondary data obtained from the Indonesian Bank, Indonesian Stock Exchange, Indonesian Ministry of Trade, and Ministry of Energy and Human Resources. The variables in this research are the return of sectoral indices listed on the Indonesian Stock Exchange: agriculture, basic industry and chemical, consumer goods, finance, infrastructure, manufacturing, mining, miscellaneous industries, property, and trade as dependent variable. The independent variables of this study are the BI rate, foreign exchange reserves, exports, inflation, Indonesian crude oil prices, exchange rates, and dummy variable that describe month of the year as the independent variables.

The approach used in this study is a multifactor model which is a class of the APT theory. Thus, all variables should be classified into groups called factors, then an estimation is conducted on the dependent variables against the independent factors, and of the predetermined ones.

The methods and stages of analysis in this study, include: establishment of a factor with Principal Component Analysis (PCA), and Seemingly Unrelated Regression (SUR). Principal Component Analysis (PCA) is a technique used to make new variables, which is a linear combination of the original variables. This analysis is used to create a set of new variables, or variable components, or latent variables, or factors, replacing a number

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with the original variable. This research formed 6 independent variable (X) into 2 factors and 10 sectors into 1 factor (Y) to be used as independent variables.

Seemingly Unrelated Regression (SUR) is a regression that consists of multiple regression equation (regression equation system). The SUR method is used when there is a correlation between the regression equations. SUR can be used if the error or residual between the different equations are correlated, or in other words there is a contemporaneous correlation between the components. The SUR test is applied across a 12 month period to determine the month of the year effect. The t-test is used to determine the significance of an independent variable affecting the dependent variables. The coefficient of determination is to see the ability of the independent variables to explain the behavior of the dependent variable.

4. Result and Discussion

4.1 PCA and SUR

The formation of factors using the Principal Component Analysis (PCA) resulted in the X's Factor-1 which is referred to Monetary Macro Factors (MMF), consisting of the BI rate, inflation, and exchange rates. While belonging to X's factor-2 is Real Macro Factor (RMF) referred to real factor, consisting of foreign exchange reserves, export, and Indonesian crude oil prices. In addition to the establishment of the independent factors (MMF and RMF), this study also formed dependent factors (FY). Formation of the Y factor (FY) includes the return of 10 sectors' indices. FY is the formation of a new variable to describe the return of the 10 sectors. Note that PCA is used as a stepping stone only in this analysis, thus the estimation is not attached.

This study uses Seemingly Unrelated Regression (SUR) because there is a correlation between the residual errors showing that equations in the model are correlated, or in other words there is a contemporaneous correlation between sectors. The result are as follows:

$$R_{agri} = 1.70 - 1.58MMF_t - 2.60\ RMF_t - 3.77\ D1 + 5.94\ FY_{t-1} \qquad R^2 = 0.86626$$
$$(1.59)\ (\text{-}1.28) \quad (\text{-}1.36) \quad (\text{-}1.02) \quad (2{,}05)^{**}$$

$$R_{basic} = 1.39 - 2.52MMF_t - 0{,}44\ RMF_t + 4.17\ D1 + 1.43\ FY_{t-1} \qquad R^2 = 0.72336$$
$$(1.72)^{***}\ (-2.68)^{*}\ (-0.30) \quad (1.49) \quad (0{,}65)$$

$$R_{cons} = 1.77 - 2.18MMF_t + 0.48\ RMF_t + 2{,}41\ D1 + 1{,}45\ FY_{t-1} \qquad R^2 = 0.76231$$
$$(3{,}29)^{*}\ (-3{,}50)^{*} \quad (0{,}50) \quad (1.30) \quad (0{,}99)$$

$$R_{fin} = 1.12 - 1.62MMF_t - 0{,}18\ RMF_t + 6{,}22\ D1 + 0{,}92\ FY_{t-1} \qquad R^2 = 0.89626$$
$$(1.50)\ (-1.88)^{***}\ (-0{,}14) \quad (2{,}41)^{**} \quad (0{,}45)5$$

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$$R_{infrastr} = 0,24 - 1.43MMF_t + 0,09\ RMF_t + 5.72\ D1 + 0,79\ FY_{t-1} \qquad R^2 = 0.82622$$
$$(0,39)\ (-2,01)^{**}\ \ (0,08)\ \ (2,70)^{*}\ \ (0,47)$$

$$R_{Manuf} = 1.53 - 2.59MMF_t - 0,23\ RMF_t + 4,29\ D1 + 1,10\ FY_{t-1} \qquad R^2 = 0.89911$$
$$(2,38)^{**}\ (-3,47)^{**}\ (-0,20)\ \ (1.93)^{**}\ \ (0,63)$$

$$R_{mining} = 1.06 - 3,35MMF_t - 4,37\ RMF_t + 0,02\ D1 + 4,89\ FY_{t-1} \qquad R^2 = 0.74626$$
$$(0,95)\ (-2,58)^{*}\ \ (-2,20)^{**}\ \ (0,00)\ \ (1,61)$$

$$R_{Miscel} = 1.57 - 2,96MMF_t - 1,33\ RMF_t + 6,55\ D1 + 0.94\ FY_{t-1} \qquad R^2 = 0.67826$$
$$(1.73)^{***}\ (-2.81)^{*}\ (-0,82)\ \ (2,09)^{**}\ (0,38)$$

$$R_{property} = 1.52 - 2,22MMF_t + 1,23\ RMF_t + 4,99\ D1 + 1,68\ FY_{t-1} \qquad R^2 = 0.84536$$
$$(1.67)^{***}\ (-2,10)^{**}\ (0,76)\ \ (1.58)\ \ (0,68)$$

$$R_{trade} = 1.41 - 2,71MMF_t + 1,73\ RMF_t + 0.95\ D1 + 3,78\ FY_{t-1} \qquad R^2 = 0.87426$$
$$(1.91)^{***}\ (-3,17)^{*}\ \ (1,32)\ \ (0,37)\ \ (1,89)^{***}$$

Notes: figures in parenthesis is t statistics
*** is significant at 1% level, ** at 5% level, and * at 10% level.

The above results show that MMF (consisting of BI Rate, inflation and exchange rates) negatively affect basic industries and the chemical, consumer goods, infrastructure, manufacturing, mining, miscellaneous industries, property, and trade sectors. While RMF, which consists of foreign exchange reserves, exports and Indonesian crude oil prices, negatively affects the mining sector. The effect of each variable can be determined by multiplying the coefficient of the factor and the responding factor loading. After obtaining the factors (using Principal Component Analysis), the estimation of the Seemingly Unrelated Regression is conducted. The movement of the return of each sector in the previous period (FY_{t-1}) has a positive effect on the agricultural and trade sectors.

Sectors in the capital market that react significantly on the change in macro-monetary-factors (MMF) are the basic industry, consumption goods, financial, infrastructure, manufacture, mining, miscellaneous goods, property, and trade. The mining sector is the only sector to have a significant reaction to the change in the macro-real-factor (RMF).

Many sectors are affected auto-regressively such as agriculture and trade. These results show that the effect of autoregressive is all positive. This means that the change today is in line with what has occurred in previous periods. This represents the behavior of investors; if prices increased in the last period, investors are more likely to invest in the current period. Sectors that have seasonal behavior, which are represented by the variable D1 are the financial, infrastructure, manufacture, and miscellaneous goods sectors.

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Macroeconomic factors in terms of monetary (MMF) consisting of the BI Rate, inflation, exchange rates and more dominant sectoral indices. BI Rate, inflation and exchange rates have a negative effect on basic industry and the chemical, consumer goods, infrastructure, manufacturing, mining, miscellaneous industry, property and trade sectors. The higher the interest rate, the higher the inflation rate, and the weaker the currency, which all result in a fall in stock prices.

Macroeconomic factors in real terms (RMF) consists of foreign exchange reserves, exports and Indonesia's crude oil prices, and also has a negative affect on the mining sector. This supports the findings of Basci (2013), who states that export affects the stock price index. There are several reasons behind this; due to the different characteristics among different sectors, each sector will respond differently to variables in economic conditions. For the mining sector, the Indonesian Ministry of Energy and Resources has issued a regulation contained in Law No. 4 of 2009 on Mineral and Coal Mining Policy. This is one variable distorting the price of firms in the mining sector from the market trend. That regulation places a ban on the export of raw minerals or raw material mines abroad which creates a negative sentiment for investors. When Indonesian crude oil prices increase, this will decrease the index return in the mining sector as crude oil is a substitution for mineral and coal mines. Meanwhile, that policy also causes the price of mining and minerals to decrease, which causes a decline in stock prices of coal mineral subsectors and the mining sector.

5. Conclusion

Macro-economic conditions will affect the daily activities of a company which will affect stock prices and sectoral conditions in a capital market. The characteristics of each sector / industry are different and each sector will respond differently to varying economic conditions. Based on this research, the monetary macroeconomic factor (BI rate, inflation and exchange rates) negatively affects basic industry and chemical, consumer goods, infrastructure, manufacturing, mining, miscellaneous industry, property and trade sectors. The Real Macro Economic Factor (foreign exchange reserves, exports and Indonesian crude oil prices), on the other hand, have a negative effect on the mining sector. Monetary macroeconomic factor have a more dominant effect on sectoral indices, and monetary variables will a larger affect on the environment and the company's performance, which will have a profound affect the respective sectors.

Based on above results, the following suggestions should be considered: Investors must consider the results of macroeconomic analysis and sectoral analysis before investing in stock market. This can be used to determine which sectors present a viable investment option. This will also reduce or minimize the risk of loss in a given stock market. The government is expected to maintain macroeconomic conditions, particularly in terms of monetary factors, because this directly affects the company's performance and ability to remain stable in the capital market, which may also affect the performance of the capital market particularly with respect to sectoral indices. Governments must create policies to encourage the performance of the capital markets so that capital market conditions in Indonesia continue to grow.

References

Aissia, Dorsaf Ben. (2016). Home and foreign investor sentiment and the stock returns. The Quarterly Review of Economics and Finance, 59, 71-77. http://dx.doi.org/10.1016/j.qref.2015.06.009

Angelidis, Timotheos, Sakkas, Athanasios, & Tessaromatis, Nikolaos. (2015). Stock market dispersion, the business cycle and expected factor returns. Journal of Banking & Finance, 59, 265-279. http://dx.doi.org/10.1016/j.jbankfin.2015.04.025

Apergis, Nicholas. (2015). Policy risks, technological risks and stock returns: New evidence from the US stock market. Economic Modelling, 51, 359-365. http://dx.doi.org/10.1016/j.econmod.2015.08.021

Basci, Esref Savas. (2015). Yield Spreads on Government Benchmark Bonds: Cross Country Evidence. Procedia Economics and Finance, 30, 57-67. http://dx.doi.org/10.1016/S2212-5671(15)01255-1

Bekiros, Stelios, & Gupta, Rangan. (2015). Predicting stock returns and volatility using consumption-aggregate wealth ratios: A nonlinear approach. Economics Letters, 131, 83-85. http://dx.doi.org/10.1016/j.econlet.2015.03.019

Bouri, Elie, Awartani, Basel, & Maghyereh, Aktham. (2016). Crude oil prices and sectoral stock returns in Jordan around the Arab uprisings of 2010. Energy Economics, 56, 205-214. http://dx.doi.org/10.1016/j.eneco.2016.03.021

Bouri, Elie. (2015). Return and volatility linkages between oil prices and the Lebanese stock market in crisis periods. Energy, 89, 365-371. http://dx.doi.org/10.1016/j.energy.2015.05.121

Couch, Robert, & Wu, Wei. (2016). The fair value option for liabilities and stock returns during the financial crisis. The Quarterly Review of Economics and Finance, 59, 83-98. http://dx.doi.org/10.1016/j.qref.2015.06.002

Hasan, Mostafa Monzur, Hossain, Mahmud, Cheung, Adrian, & Habib, Ahsan. (2015). Corporate life cycle and cost of equity capital. Journal of Contemporary Accounting & Economics, 11(1), 46-60. http://dx.doi.org/10.1016/j.jcae.2014.12.002

Heriqbaldi, Unggul, Ismail, Munawar, Kaluge, David, & Santoso, Dwi Budi. (2014). A Regime Switching Analysis Of Indonesia's Exchange Market Pressure. The Singapore Economic Review, 59(02), 1450013. http://dx.doi.org/10.1142/s0217590814500131

Hung, Chi-Hsiou D., Azad, A. S. M. Sohel, & Fang, Victor. (2014). Determinants of stock returns: Factors or systematic co-moments? Crisis versus non-crisis periods. Journal of International Financial Markets, Institutions and Money, 31, 14-29.: http://dx.doi.org/10.1016/j.intfin.2014.03.005

Kaluge, David, & Puspita, Wilujeng. (2015). Asymmetric Reaction towards Financial Shocks in ASEAN Countries. Procedia - Social and Behavioral Sciences, 211, 519-527. http://dx.doi.org/10.1016/j.sbspro.2015.11.069

Masood, O., Tvaronavičienė, M., Javaria, K. 2019. Impact of oil prices on stock return: evidence from G7 countries, *Insights into Regional Development* 1(2): 129-137. https://doi.org/10.9770/ird.2019.1.2(4)

Pujiharjanto, C.A. (2013). Efek Kalender Bulanan di Bursa Efek Indonesia: Bukti Empiris dan Implikasi. Buletin Ekonomi Moneter dan Perbankan, 8(3), 98.

Tandelilin, E. (2001). Analisis Investasi dan Manajemen Portofolio. Yogyakarta: BPFE.

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POLITICAL CONNECTION, BLOCKHOLDER OWNERSHIP AND PERFORMANCE*

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Abstract. This paper aims to examine the effect of blockholder of political connected firm on the performance of conglomerates. The sample of this paper is all 66 conglomerates listed on the Indonesia Stock Exchange from 2006 to 2014. Regression panel data with General Least Square was used for this analysis. It was found that Family and state blockholder have positive and significant effect on firm value at all cut off (10%-50%), political connections in the family, state, and public blockholder have significant positive effect on firm value. The result of this paper indicates that the structure of companies' ownership has contribution to determine the political connections in the conglomerates. The concentration of ownership in the company and family as controlling highest conglomerate in Indonesia as well as their involvement in politics implies that Indonesia has fallen into oligarchy state, in which the rules are held by a group of wealthy political elites.

Keywords: firm value; political connection; blockholder; Indonesia

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JEL Classifications: M40. M41. M49

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1. Introduction

In developing countries, conglomerates have strong position due to the concentration of economic power in the hands of a small group of large conglomerates (Claessens et al., 1999). Likewise, the conditions that occur in Indonesia is similar, where the company contributes huge portion to GDP Indonesian conglomerate. With a small number (only 0.01%) of the total companies in Indonesia, they contribute enormously to the GDP of Indonesia at 44.4% (BPS, 2009). In fact, of the total 510 companies listed on the Indonesia Stock Exchange in 2014, there were 116 conglomerate's companies in the Indonesia Stock Exchange which control more than 70% of the total market capitalization of the Stock Exchange (Wati et al., 2016a). In the period of 2006 – 2014, they dominate the market capitalization which consecutively account for 76.25%, 77.62%, 76.10%, 78.88%, 75.24%, 68.46%, 74.45%, 72.35% and 71.61%.

In 2009, the capitalization of conglomerate increased by 94.46%. Likewise, in 2014 alone, their capitalization increased by 22.66% from the previous year and the highest value for the whole year of observations. Increased conglomerate's capitalization in 2009 was attributed to significant increase and improvements in economic conditions after the global crisis which was predicted by the legislative and presidential elections in Indonesia. This phenomenon is amplified by the increasing market value of companies in the enterprise political connections with the winner of the election party and the president, especially in large companies and state-owned enterprises. The condition shows that the entrepreneurs and corporate leaders in developing countries such as Indonesia where the level of corruption is still high, are believed to have political connections that provide benefits to achieve the companies' objectives. Hence, they strive to foster political connections in order to achieve the growth of the company since they realize that the political connections are a valuable resource (Fisman, 2001; Li et al., 2012).
In the countries with weak legal system and the high level of corruption, political connections are very valuable to the company; even these aspects are not inseparable in the country which has a strong legal system such as in the USA (Goldman et al., 2009). in their study, they found that political connections have a broad effect on the value of the firm in the United States Presidential Election in 2000 and a parliament member who won by Republican Party. Likewise, Faccio (2006) supported the findings of Goldman et al. (2009), using a sample of 47 countries, he documented that political connections are very common in countries with high levels of perceived corruption, even samples of first ranked companies in Indonesia have the largest political connections with members of parliament (DPR), ministers, president, and relations relatives.This condition is underpinned by the structure of corporate ownership in Indonesia which are concentrated and controlled by the family. These conditions are inseparable from companies' conglomerate. La Porta et al., 1999; Claessens et al., 2000; Lukviarman, 2004; Kim, 2006; and Siregar, 2006, proved that companies in Indonesia have concentrated ownership structure in the family.
There are various researches on conglomerates in some countries encouraging writer's interest in investigating the conglomerates in Indonesia, as well as many businessmen who get involved in politics. To the author's best knowledge; there are few researchers who conducted extensive study on the conglomerate in Indonesia. The results of this present research shows that the political connection on family controlling and state block holder have a positive and significant effect on firm value (Tobin's Q and Return on Assets).

The rest of this paper is structured as follows: After the introduction, Section 2 discusses important literature on this topic an examination of relevant theories as well as hyphoteses development, while section 3 elaborates on research methodology. Section 4 discusses major findings of the study and finally in section 5, paper is summarised and concluded.

2. Literature Review

According to Dicko (2017) the basic presupposition of agency theory is the separation of management and ownership. In the classic economic model, capitalist companies are supposed to be owned by several shareholders scattered across the market, each of whom hold a small share. The shareholders then hire a professional manager

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who, in return for a substantial payment, is supposed to ensure that shareholders get a return on their investment. Given the opportunistic nature of human beings, manager can act in their own interest at the expense of shareholders to maximize their own personal utility – hence the potential conflicts of interest between shareholders and management and the resulting cost.

Claessens et al. (2000) mentioned that the block holder in Indonesia is controlled by the family, the state and financial institutions. Furthermore, Siregar (2006) supported the findings of Claessens et al. (2000), in which it is stated the cut-off 10% - 50% concentration of ownership in Indonesia is 99.09%, 95.36%, 89.95%, 79.83%, and 68.04%, respectively. Family as a block holder is not only found in developing countries, but it is also common in developed countries even though there are still many companies that are controlled by the family (Faccio et al., 2001). Arifin (2003) and Siregar (2006) also proved that the block holder of a public company is mostly controlled by the family of Indonesia. Arifin (2003) stated that the family is a primary owner of a public company in Indonesia. These findings are consistent with the study results of La Porta et al. (1999), and Claessens et al. (2000) which stated that the family dominates ownership of public companies.

Based on the literature review and previous researches regarding the block holder, especially in Indonesia, Hypothesis 1 is formulated as follows:
H_{1a} : The family block holders have positive effect to the conglomerate performance.
H_{1b}: The institutions block holders have positive effect to the conglomerate performance.
H_{1c} : The state block holders have positive effect to the conglomerate performance.
H_{1d}: The public firm block holders have positive effect to the conglomerate performance.

The ownership structure of the company has a contribution in determining the political connections (Wati et al., 2015). This is evidenced by Boubakri et al. (2008), resulting that political connections in the company are positively related to the rest of government ownership, and are negatively related to foreign ownership. On the other hand, Tian and Cheung (2013) documented the different results, where political connections in China can increase the value of firms controlled by the family, but the political connections do not significantly affect the value of firms controlled by the government. Political connections of the company controlled by the family have better access to bank loans, tax rebates and subsidies granted by the government compared to those controlled by the government (Tian and Cheung, 2013). When the block holder is a family which has political connection, it is likely to dominate the board of directors so that they can make a deal with government officials and enjoy exclusive privileges among them (Chen et al., 2011).

The company has political connection if one of the shareholders or the top management of the company is a member of parliament, ministers or heads of state, or who have a close relationship with political party officials (Faccio, 2006: 370).

Political connections would be more effective in the conditions of high levels of corruption and weak regulation, for both small companies and large companies (Faccio, 2006; Do et al., 2013). Wong (2010) proved that the company experienced an increase in ROE and MBV ratio after joining the Selection Committee. This means that political connections are able to improve the company's performance as measured by ROE and MBV Ratio. In addition, Do et al. (2013) supported research Wong (2010), stating that political connections are able to increase the value of the company at the state level.

Although various profits can be gained by corporate politically connected, political connections had a negative impact on the company, namely high leverage followed by overinvestment (Wu et al., 2012), the decline in stock prices and stock returns (Fisman, 2001; Fan et al., 2007), the decline in performance of the company (Leuz and Gee, 2006; Xu and Zhou, 2008; Li and Xia, 2013), the poor quality of financial report (Chaney et al., 2011).

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Deng et al. (2012) examined the effect of diversification in the companies which have political connection and its influence on companies in China. They found that political connections have a positive and significant impact on the performance of the company. The influence of political connections on conglomerate (unrelated diversification) is stronger than the related diversification. However, politically connected conglomerate (unrelated diversification) will have a negative impact on the performance of the company in the future (long-term) which can harm the company. The company which has a market value of political connection tend to diversify in unrelated field (unrelated diversification).

Supporting the findings of Deng et al. (2012), Ang et al. (2013) examined the companies politically connected in Singapore. They found that within three years after the IPO, most of companies which were previously independent from political connections, but, after the sample was broken down into several categories of industry, it was found the director of the company had political connection and positive and significant impact on the value of the firm.

Based on the systematic review of previous researches, it is found that, positive influence of political connections on firm value (Johnson and Mitton, 2003; Faccio, 2006; Goldman et al .; 2006; Boubakri et al., 2008; Wong, 2010; Cooper et al ., 2010; Ang et al., 2013; Do et al., 2013). It is supported by the study results of Li et al. (2012) which showed a strong positive correlation between political connections and the company diversification. Political connections can be more impactful for the company diversified in unrelated fields (conglomerate). Deng et al. (2012) supported the findings of Li et al. (2012), confirming that the performance of conglomerate (unrelated diversification) which has political connection is better than that of the company which has political connection with related diversification. Wati et al (2016b) and Wati (2017) showed positive effect between political connections on conglomerate performance (accounting and market performance). These results indicate that political connections to the conglomerate are more valuable than non-conglomerate.

According to Pirzada et al. (2015) the role of the block holder in a strong political connection already stated above, according to the author's best knowledge, there still lack of research which examines and focuses on the role of block holder (family, institution, state and public firm) and the influence of political connections on the performance or value of conglomerate. Based on the empirical explanation mentioned above and examining the phenomenon of the ownership structure in Indonesia, Hypothesis 2 is formulated as follows:

H_{2a} : Political connections at the family blockholder have a positive effect on the conglomerate performance;
H_{2b} : Political connections at the institution blockholder have a positive effect on the conglomerate performance;
H_{2c} : Political connections at the state blockholder have a positive effect on the conglomerate performance;
H_{2d} : Political connections at the company controlled by public firm have a positive effect on the conglomerate performance.

3. Research Methodology

The present study used secondary data from the period of 2006 – 2014 based on published annual report. The research sample is all conglomerates listed on the Indonesia Stock Exchange since 2006 which publish annual financial reports and never delisting from the capital market. Based on these criteria, the total of conglomerate accounted for 72 companies, from which it can be processed as many as 66 companies (2006 – 2014), so that the total samples observed in this study were 594.

The variables used in this research were conglomerate performance, political connection, and block holder. Conglomerates performance in this paper used a market-based approach (market performance) and profit-based approach (accounting performance) (Niessen & Ruenzi, 2007; Deng et al., 2012). Market performance indicators used the proxy of Tobin's Q and profit-based approach (accounting performance) used the proxy of Return on Assets (Niessen & Ruenzi, 2007; Deng et al., 2012).

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Meanwhile, the political connection used a number of criteria according to Fisman, 2001; Leuz dan Gee, 2006; Faccio, 2006. In regard with the criteria, it is defined if one of the shareholders or top management of the companies is a member of parliament, ministers or heads of state, or who have a close relationship with them from political party officials, the army and police officials. The member of parliament, ministers, or former heads

To ensure that the model used to test the hypotheses as mentioned in the previous paragraph applies to all conglomerates, the variable of firm size, age and growth as a control variable were used. The following table (Table 1) explains the operationalization of variables.

Table 1. Description of Variables

Variables	**Description**
Performance Measure:	
Return on Assets	Ratio of profit after tax to total assets
Tobin's Q	Ratio of the market capitalization plus debt divided the total assets
Independent Variable:	Dummy Variable:
Political Connection	1 = political connected; 0 = nonpolitical connected
Ownership Variables:	Dummy Variable
Family	1=if the firm has family Blockholder, 0 = otherwise
Institutional (finance)	1=if the firm has institutional Blockholder, 0 = otherwise
State	1=if the firm has state blocholder, 0 = otherwise
Public firm	1=if the firm has public firm blocholder, 0 = otherwise
Blockholder of cut off 10%	1=if the blocholder owns (10-20%) of the shares, 0 = otherwise
Blockholder of cut off 20%	1=if the blocholder owns (20-30%) of the shares, 0 = otherwise
Blockholder of cut off 30%	1=if the blocholder owns (30-40%) of the shares, 0 = otherwise
Blockholder of cut off 40%	1=if the blocholder owns (40-50%) of the shares, 0 = otherwise
Blockholder of cut off 50%	1=if the blocholder owns (>50%) of the shares, 0 = otherwise
Control Variables:	
Firm Size	Log of Total Assets
Growth	Ratio of ΔTotal Sales to total sales
Firm Age	Number of years since incorporation

In this study, a block holder is defined according to La Porta et al (1999), Claessens et al (2000), Faccio and Lang (2002), Arifin (20030, Siregar (2006), as families, financial institutions, state enterprises, and public company owned by people at the level of control rights which are 10% - 50% (cut off).
To test the hypotheses in the study, regression model with General Least Square was used as follows:
Hypotheses1 testing used Model 1

$$Tobin'sQ_{it} = \alpha 1 + \beta 1 Fam_{it} + \beta 2 Inst_{it} + \beta 3 State_{it} + \beta 4 Tbk_{it} + \beta 5 Size_{it} + \beta 6 Growth_{it} + \beta 7 Age_{it} + \varepsilon 1 ...(1)$$

$$ROA_{it} = \alpha 2 + \beta 8 Fam_{it} + \beta 9 Inst_{it} + \beta 10 State_{it} + \beta 11 Tbk_{it} + \beta 12 Size_{it} + \beta 13 Growth_{it} + \beta 14 Age_{it} + \varepsilon 2 ...(2)$$

Hypotheses 2 testing used Model 2

$$Tobin'sQ_{it} = \alpha 1 + \beta 1 Pol^{*} Fam_{it} + \beta 2 Pol^{*} Inst_{it} + \beta 3 Pol^{*} State_{it} + \beta 4 Pol^{*} Tbk_{it} + \beta 5 Size_{it} + \beta 6 Growth_{it} + \beta 7 Age_{it} + \varepsilon 3 ...(3)$$

$$ROA_{it} = \alpha 2 + \beta 8 Pol^{*} Fam_{it} + \beta 9 Pol^{*} Inst_{it} + \beta 10 Pol^{*} State_{it} + \beta 11 Pol^{*} Tbk_{it} + \beta 12 Size_{it} + \beta 13 Growth_{it} + \beta 14 Age_{it} + \varepsilon 4 ...(4)$$

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4. Results

4.1. Descriptive Statistics Analysis

An overview of research data in 2006 - 2014 shown in Table 2 is presented as follows.

Table 2.
Blockholder Ownership

Cut Off	Year	Blockholder Ownership				Total
		Family	Institution	State	Public Firm	
10%	2006	54	21	9	11	95
	2007	54	21	10	10	95
	2008	53	24	10	13	100
	2009	53	19	10	13	95
	2010	52	20	10	11	93
	2011	53	27	10	11	101
	2012	52	23	10	10	95
	2013	54	20	10	10	94
	2014	53	20	10	9	92
	Conglomerate	478	195	89	98	860
	Percentage	55,58%	22,67%	10,35%	11,40%	100%
20%	2006	54	14	8	9	85
	2007	51	14	9	9	83
	2008	52	13	9	10	84
	2009	51	15	9	10	85
	2010	50	11	9	9	79
	2011	49	12	9	9	79
	2012	48	13	9	9	79
	2013	49	9	9	9	74
	2014	49	8	9	9	74
	Conglomerate	453	109	80	82	724
	Percentage	62,57%	15,06%	11,05%	11,33%	100%
30%	2006	46	7	8	6	67
	2007	43	6	9	6	64
	2008	47	6	9	6	68
	2009	48	9	9	6	72
	2010	46	9	9	6	70
	2011	45	10	9	6	70
	2012	45	11	9	7	72
	2013	46	8	9	7	70
	2014	47	7	9	6	69
	Conglomerate	413	73	80	56	622
	Percentage	66,04%	11,74%	12,86%	9%	100%
40%	2006	44	4	8	5	61
	2007	43	5	9	5	62
	2008	42	4	9	5	60
	2009	40	6	9	5	60
	2010	39	6	9	5	59
	2011	36	7	9	5	57
	2012	38	7	9	6	60
	2013	40	6	9	5	60
	2014	41	5	9	5	60
	Conglomerate	363	50	80	46	539
	Percentage	67,35%	9,28	14,84%	8,53%	100%
50%	2006	36	2	8	4	85
	2007	38	3	9	4	83

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	2008	37	4	9	4	84
	2009	35	4	9	4	85
	2010	35	5	9	4	79
	2011	31	3	9	5	79
	2012	33	3	9	6	79
	2013	34	2	9	5	76
	2014	37	1	9	5	74
	Conglomerate	316	27	80	41	464
	Percentage	68,10%	5,82%	17,24	8,84%	100%

Based on table 2, the data of the conglomerates indicate that family is the main block holder, which accounts for 55.58%, 62.56%, 66.40%, 67.84%, and 68.10% at cut off 10%, 20%, 30%, 40%, and 50% respectively. The higher the value of cut off is, the greater the percentage of family ownership will be. It indicates that the family is the main controller in the conglomerate. The results of this study are not much different from the findings of Claessens et al. (2000) who found that 54% of public companies are controlled by the family at the cut off control rights 10%. Moreover, they found that the highest percentage of the companies controlled by families is in Indonesia, which accounts for 69%. At the cut off 20%, the number of family companies is 53% and the number of family-controlled companies is mostly in Indonesia, which accounts for 72%. The study results are also supported by the findings of Siregar (2006), who found that the family is the main block holder, which accounts for 55.61%55.55%, 55.67%, 55.29%, and 53.80% at the cut off 10%, 20%, 30%, 40%, and 50% respectively. These results indicate that the majority of conglomerate in Indonesia is controlled by the family. This finding is also consistent with those of La Porta et al. (1999), Faccio and Lang (2001), Arifin (2003), and Siregar (2006) which stated that the family dominates the ownership of public companies.

In addition, based on Table 2 above, at cut off 10% - 50%, the percentage of the financial institutions which control the companies is 22.67%, 15.05%, 11.74%, 9.35%, and 5.83% respectively. Meanwhile, the state controls public companies by 10.35%, 11.05%, 12.86%, 14.95%, and 17.24% respectively. This result is not much different with the findings of Claessens et al. (2000) which stated that the government controls public companies primarily in Singapore and Indonesia by 24% and 10% respectively. Likewise, La Porta et al. (1999) found that at the cut off control rights 20%, the average public company controlled by the government is 18%.

A public company is categorized as that controlled by another public company if its largest block holder is a public company owned by the community with the certain level of control rights. Based on Table 2 above, at the cut off 10% - 50%, the number of public company which is controlled by other public companies accounts for 11.40%, 11.33%, 9%, 8.60% and 8.84% respectively. In fact, the results of this study are not much different from that of Claessens et al. (2000) which found that at the cut off of control rights at 10%, 17%, Asian public companies which are controlled by other public companies with extensive holdings are especially in Philippines (36%) and Hong Kong (24%). In Indonesia, there are 17% of public companies which are controlled by other public companies with extensive holdings. But for the right to control cut off 20%, there are 13% of public companies which are controlled by other public companies with extensive holdings, especially in Philippines (27%) and Hong Kong (20%). On the other hand, in Indonesia, there are 13% public companies controlled by another public company with extensive holdings.

The greater cut off used, the greater decrease the number of the block holder in the conglomerate will have. However, although the cut off value increases by 20%, 30%, 40% and 50%, the concentration of conglomerate ownership in Indonesia still remains high, especially in the controlling family. These results are supported by the finding that the ten family companies in Indonesia during the year of observation dominated the average market capitalization by 30% out of the total number of public companies in Indonesia. In 2006, with a small number of companies controlled only by 10 families, they dominated the market capitalization accounted for 25.45% of the

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total companies of 344. In the year of 2007, they further dominated the market capitalization of 25.76% of 383 total companies. Furthermore, in 2008, the market capitalization they dominated was 25. 73% out of 396 total companies. In 2009, the portion increased to 30.44% of 398 total companies. A year later, the market capitalization they dominated slightly decreased to 29.22% of 420 companies compared with that of the previous year. In 2011, their domination of market capitalization was at 26.35% of 440 total companies, while in 2012, they dominated market capitalization by 33.77% of 462 total companies. In the following year, they dominated the market capitalization by 32.73% out of 483 companies, and in 2014, their domination on market capitalization was 31.73% of 510 companies (IDX processed data, 2016).

These findings on that market capitalization is held by ten families is also in agreement with that of Claessens et al., (2000) in which they revealed that the market capitalization in Indonesia is controlled by one family by 16.6%, and a half of the market capitalization in the country is dominated by the ten largest family..The massive accumulation of ownership supports the previous findings revealing that there is a shift of main conflict within the company from a conflict between shareholders and management (Jensen and Meckling, 1976) to a conflict between block holders and minority shareholders in Indonesia (La Porta et al., 1999; Claessens et al. 2000; Lukviarman, 2004; Siregar, 2006).

Table 3 below describes the Tobin's Q, Return on Assets, company size, company growth and firm age in politically connected conglomerate and that which is non-politically connected.

Table 3.
Description of Firm Value and Control Variabel

Variable	Panel A				Panel B			
	Political Connected N=349				Non Political Connected N=237			
	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev
Tobins Q	0,11	17,94	1,994	2,279	0,07	11,13	1,7	1,599
ROA (%)	-17	82	8,93	11,72	-29	46	6	11,9
Size (Log)	5,18	8,93	7,082	0,712	4,33	7,80	6,546	0,695
Growth (%)	-94	1071	32,75	101,48	-92	21.514	119,79	13.986
Age	3	32	15,79	5,56	1	64	16,41	10,08

Based on Table 3, the average value of Tobin's Q on politically connected companies are larger than those which do not have political connection (1.994> 1.7). Likewise, the average value of Return on Assets in the politically connected companies is higher than those which do not have political connection (8.93%> 6%). The average value of the size of the firm which has political connection is also higher than those which do not have political connection (7.082> 6.546). Meanwhile, the average value of the company's growth which is proxied by sales growth in the politically connected companies is lower than those which do not have political connection (32.75 <119.79). Furthermore, the average age of the firms which have political connection is found to be younger than those which do not have political connection (15.79 <16.41). The higher value of Tobins'Q and Return on Assets of the conglomerate which has political connection that that which does not have political connection in Indonesia indicate that the existence of political connections provide benefit to the company.

4.2. Hypothesis testing and Discussion

Based on the result of first hypothesis model testing in Table 4 and 5, it shows that the families blockholder have positive effect on the value of the firm both on Tobin's Q and Return on Assets only in the cut off 20%, 40% and 50% at the significance level of 5%. Meanwhile, the block holders of financial institutions have negative effect on the value of the firm both on Tobin's Q and Return on Assets at the all cut off ranging from 10% to 50%.

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State block holder has significantly positive effect on Tobin's Q and Return on Assets on all cut off 10%, 20%, 30%, 40% and 50% at significance level of 1%. Meanwhile, the block holder of public company has positive effect only on Return on Assets at cut off 20% - 50%. Based on the research result by standardized regression analysis (in appendix), state controlling has stronger effect on the value of the firm both in Tobinn's Q and the Return on Assets in all cut off 10% to 50% compared to other controllers (family, financial institutions, and public company). The test result is consistent with the result of robustness test, the result of which shows that the second model is robust.

The result of research on the block holder is in line with Wiwattanakantang (2001); Isik and Soykan (2013); stating that the presence of large shareholder has positive effect on firm value. It means that large shareholder in the company encourages to conduct better monitoring of the manager. This research also proves that large shareholder at the higher ownership level has positive effect on firm value. This finding is in line with the statement of Shleifer and Vishney (1997) which said that company with some of the large shareholders can enable shareholders to monitor each other and also to collaborate to put common interests above their own private interests.

Concentrated ownership can serve as a corporate governance mechanism to perform better monitoring and effective management so that it would reduce agency conflict (Shleiver and Vishny, 1986; Anderson and Reeb, 2003; Konijn et al., 2011). Thus, the block holder of the company will have positive impact on the firm value. This result indicates that large shareholders do not always generate private benefits (self-oriented) on the cost paid by the minority shareholders. Hence, the result of this research also proves that the agency problem in the conglomerate will be reduced by the existence of block holders.

The existence of block holder, especially the family and the state in the conglomerate, will give positive effect on the firm value both on market performance and financial performance. This breaks the perception of some people where monitoring is less effective in affiliated group company or conglomerate.

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Table 4.
Testing Results of Model 1.1

$$Tobin'sQ = \alpha 1 + \beta 1 Fam_{it} + \beta 2 Inst_{it} + \beta 3 State_{it} + \beta 4 Tbk_{it} + \beta 5 Size_{it} + \beta 6 Growth_{it} + \beta 7 Age_{it} + \varepsilon 1 ...(1)$$

	Prediction	Panel A. Research Model Tobin's Q				
		Cut Off				
		10%	**20%**	**30%**	**40%**	**50%**
Constant		1,22***	0,554***	0,556**	0,743***	0,427*
Fam	β+	-0,119	0,143**	0,078	0,143**	0,254***
Inst	β+	-0,243***	-0,065	-0,098	-0,157**	-0,224***
State	β+	0,378***	0,637***	0,6***	0,659***	0,655***
Tbk	β+	-0,134*	0,048	0,06	0,036	0,06
Size	β+	-0,01	0,05	0,054	0,013	0,061*
Growth	β+	0,001	0,001	0,001	0,001	0,002
Age	β+	0,031***	0,027***	0,029***	0,035***	0,03***
F_{stat}		11,94***	26,941***	11,96***	13,67***	20,84***
Adjusted R^2		11,46	11,11%	11,47%	13,04%	19 %
		Panel B. Robust Test Tobin's Q				
		Cut Off				
		10%	**20%**	**30%**	**40%**	**50%**
Constant		1,615***	1,29***	1,335***	1,368***	1,342***
Fam	β+	-0,089	0,227**	0,189***	0,178***	0,244***
Inst	β+	-0,24***	-0,075	-0,051	-0,145**	-0,214***
State	β+	0,348***	0,679***	0,65***	0,618***	0,644***
Tbk	β+	-0,151*	0,001	0,057	-0,022	0,005
Size	β+	-	-	-	-	-
Growth	β+	-	-	-	-	-
Age	β+	-	-	-	-	-
F_{stat}		10,58***	15,17***	13,07***	16,57***	20,79***
Adjusted R^2		6,1%	8,72%	7,53%	9,52%	11,78 %

*** Significance 1%, ** Significance 5%, * Significance 10%.

The table above summarizes the results of testing the effect of controlling shareholders consisting of family, financial institutions, state and public company to firm value are proxied by Tobin's Q and Return on Assets, and robust test without using control variables, namely size, growth and age. Controlling shareholder tested on a cut-off of 10% -50% which is the ownership control. Tobin's Q calculated from the market value of the shares plus the book value of debt divided by the book value of assets. Return on Assets is calculated from the company's net profit divided by the book value of assets. The controlling shareholder of using dummy, "1" if the company is controlled by

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a controller (family, institutions, countries and companies tbk); and "0" otherwise. Size is the logarithm of total assets, growth is the growth of the company sales Δsales / sales, and age is calculated from the first time the company go public.

Table 5.
Testing Results of Model 1.2

$$ROA = \alpha 2 + \beta 8 Fam_{it} + \beta 9 Inst_{it} + \beta 10 State_{it} + \beta 11 Tbk_{it} + \beta 12 Size_{it} + \beta 13 Growth_{it} + \beta 14 Age_{it} + \varepsilon 2 ...(2)$$

	Predict	Panel A. *Research Model ROA*				
		Cut Off				
		10%	**20%**	**30%**	**40%**	**50%**
Constant		0,013	-0,022	-0,008	-0,011	-0,03*
Fam	β+	0,008	0,018***	0,008*	0,015***	0,024***
Inst	β+	-0,027***	-0,013**	-0,02***	-0,016***	-0,02*
State	β+	0,077***	0,099***	0,09***	0,1***	0,09***
Tbk	β+	0,006	0,013**	0,02***	0,036***	0,025***
Size	β+	-0,002	0,0007	0,0003	-0,0002	0,002
Growth	β+	-0,0003	-0,0004	-0,0004	-0,0004	-0,0005
Age	β+	0,004***	0,004***	0,004***	0,004***	0,004***
F_{stat}		37,22***	42,24***	47,14***	48,27***	50,03
Adjusted		29,99%	32,78%	35,3%	35,89%	36,7%
		Panel B. *Robust Test ROA*				
		***Cut Off* (*Cut Off*)**				
		10%	20%	30%	40%	50%
Constant		0,067***	0,047***	0,047***	0,048***	0,044***
Fam	β+	-0,001	0,013**	0,011**	0,011**	0,027***
Inst	β+	-0,033***	-0,017***	-0,015***	-0,015**	-0,02
State	β+	0,056***	0,086***	0,08***	0,082***	0,086***
Tbk	β+	0,003	0,013**	0,022***	0,033***	0,026***
Size	β+	-	-	-	-	-
Growth	β+	-	-	-	-	-
Age	β+	-	-	-	-	-
F_{stat}		29,83***	31,88***	39,11***	36,8***	34***
Adjusted		16,28%	17,24%	20,45%	19,48%	18,21 %

Source: Data processed, 2016
*** Significance 1%, ** Significance 5%, * Significance 10%.

From four block holders, it is only financial institution that has negative effect on Tobin's Q and Return on Assets at all cut off. This result is consistent with the research result of Khanna and Palepu (1999) arguing that the financial institutions in domestic companies have negative effect on the firm value. The existence of institutional shareholders is not able to monitor conglomerate, instead, it is supposed due to the presence of family block holders and the state which is large in the conglomerate. The result of descriptive analysis supports the result of

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hypothesis testing where the greater cut off, then the smaller the percentage of controlling financial institutions and public companies will be. Yet, the opposite happens to the family block holder and the state, where the higher cut off, the greater percentage of controller is. The expropriation is carried out by the block holder in large companies in Indonesia, particularly by conglomerate to gain private benefits and controls to maximize their own welfare. Although the practice is commonly carried out by large companies through distributing wealth from other parties, it will undermine their reputation. Yet, the practice is proven not to be common for conglomerate in Indonesia.

Table 6.
Testing Results of Model 2.1

$$Tobin'sQ_{it} = \alpha 1 + \beta_1 Pol*Fam_{it} + \beta_2 Pol*Inst_{it} + \beta_3 Pol*State_{it} + \beta_4 Pol*Tbk_{it} + \beta_5 Size_{it} + \beta_6 Growth_{it} + \beta_7 Age_{it} + \varepsilon 3 ...(3)$$

		Panel A. Research Model (Tobins Q)				
		Cut Off				
	Prediction	**10%**	**20%**	**30%**	**40%**	**50%**
Constant		0,575**	0,575**	0,709***	0,798***	0,628**
Pol*Fam	β+	0,098*	0,16***	0,167***	0,263***	0,36***
Pol*Inst	β+	-0,129*	-0,058	-0,134	-0,232**	-0,236
Pol*State	β+	0,484***	0,589***	0,607***	0,627***	0,624***
Pol*Tbk	β+	-0,049	-0,157	-0,022	-0,03	-0,016
Size	β+	0,056***	0,06	0,036	0,016	0,04
Growth	β+	0,0006	0,0006	0,0006	0,0006	0,0009
Age	β+	0,028***	0,024***	0,027***	0,03***	0,029***
Fstat		10,346***	10,65***	11,854***	12,92***	14,72***
Adjusted R^2		9,95%	10,24%	11,37%	12,37%	13,96%
		Panel B. Robust Test (Tobins Q)				
		Cut Off				
		10%	**20%**	**30%**	**40%**	**50%**
Constant		1,365***	1,333***	1,341***	1,352***	1,342***
Pol*Fam	β+	0,2***	0,274***	0,285***	0,347***	0,429***
Pol*Inst	β+	-0,098	-0,038	-0,084	-0,153*	-0,213
Pol*State	β+	0,522***	0,631***	0,654***	0,643***	0,652***
Pol*Tbk	β+	-0,08	-0,152	-0,005	0,017	0,026
Size	β+	-	-	-	-	-
Growth	β+	-	-	-	-	-
Age	β+	-	-	-	-	-
Fstat		9,51***	15,11***	16,93***	18,47***	19,6***
Adjusted R^2		5,43%	8,69%	9,71%	10,56%	11,15%

Source: Data processed, 2016
*** Significance 1%, ** Significance 5%, * Significance 10%.
The table above summarizes the results of testing the effect of political connections in various controlling shareholders consisting of family, financial institutions, state and public company to firm value are proxied by Tobin's Q and Return on Assets, and robust test without using control variables, namely size, growth and age. Controlling shareholder tested on cut-off of 10% -50%, the control of ownership. Political connections using a dummy, "1" if the conglomerates have political connections; and "0" otherwise. Interaction

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political connection is made to all the variables controlling shareholder (family, institutions, countries and public companies). Return on Assets is calculated from the company's net profit divided by the book value of assets. Size is the logarithm of total assets, growth is the growth of the company sales Δsales / sales, and age is calculated from the first time the company go public.

Table 7.
Testing Results of Model 2.2

$$ROA_{it} = \alpha_2 + \beta_8 Pol * Fam_{it} + \beta_9 Pol * Inst_{it} + \beta_{10} Pol * State_{it} + \beta_{11} Pol * Tbk_{it} + \beta_{12} Size_{it} + \beta_{13} Growth_{it} + \beta_{14} Age_{it} + \varepsilon_4 ...(4)$$

		Panel A. Research Model (Return on Assets)				
		Cut Off				
	Prediction	**10%**	**20%**	**30%**	**40%**	**50%**
Constant		-0,009	-0,011	-0,013	-0,02	-0,02
Pol*Fam	β+	0,01**	0,016***	0,015***	0,023***	0,028***
Pol*Inst	β+	-0,021***	-0,022***	-0,023***	-0,02***	-0,019*
Pol*State	β+	0,075***	0,09***	0,088***	0,089***	0,09***
Pol*Tbk	β+	-0,001	-0,0007	0,007	0,018**	0,013*
Size	β+	0,0006	0,0003	0,001	0,002	0,001
Growth	β+	-0,0007	-0,0006	-0,0007	-0,0007	-0,0007
Age	β+	0,004***	0,004***	0,004***	0,004***	0,0037***
Fstat		31,34***	44,29***	46,65***	51,2***	51,57***
Adjusted R^2		26,4%	33,86%	35,06%	37,29%	37,42%
		Panel B. Robust Test (Return on Assets)				
		Cut Off				
		10%	20%	30%	40%	50%
Constant		0,051***	0,047***	0,047***	0,046***	0,047***
Pol*Fam	β+	0,011**	0,018***	0,021***	0,03***	0,036***
Pol*Inst	β+	-0,015**	-0,013**	-0,01*	-0,01	-0,017*
Pol*State	β+	0,065***	0,086***	0,084***	0,085***	0,084***
Pol*Tbk	β+	0,003	-0,003	0,01	0,024***	0,016**
Size	β+	-	-	-	-	-
Growth	β+	-	-	-	-	-
Age	β+	-	-		-	-
Fstat		15,35***	31,47***	33,9***	37,61***	39,81***
Adjusted R^2		8,83%	17,05%	18,16%	19,83%	20,75%

Source: Data processed, 2016
*** Significance 1%, ** Significance 5%, * Significance 10%.

Based on the result test of second hypotheses model testing presented in Table 6 and 7, it shows that political connection in the state and family-controlled companies have significant positive effect on Tobin's Q and Return on Assets at all cut off from 10% to 50%, while the political connections in the companies controlled by institutions have negative affect on Tobin's Q and Return on Assets at all cut off from 10% to 50%. Political connections in the companies controlled by the public company have positive effect only on Return on Assets at the cut off 40% and 50% only. Based on the results of standardized regression analysis (in appendix), the effect of political connections on companies controlled by the state have greater effect on the firm value both in Tobinn's Q

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and Return on Assets in all cut off from 10% to 50% compared to other controllers (family, institutional or public company). The result of of third model testing is consistent with robustness test which indicates that that the third research model is robust or sturdy.

This result is consistent with the finding of Boubakri et al. (2008) in which they found that political connection in the company is positively related to government ownership. Likewise, Tian and Cheung (2013) found that political connection can increase the firm value which is controlled by family. Political connection proves to be able to obtain government protection, such as greater amount of bank loans, long-term credit, lower real effective tax rate as well as greater government subsidies.

The result of this research indicates that the structure of companies ownership have contribution to determine the political connections in the conglomerate. The family block holder and the state in the company with political connection, tend to dominate the board of commissioners so that they can make a deal with government officer to obtain the exclusive benefit from them (Chen et al., 2011).

The test result of political connections on the companies which are controlled by the public ownership do not have effect on Tobin's Q at all cut off from 10% to 50%. Neither do it have effect on the ROA at cut off from 10% to 30%. But, at the cut off 40% and 50%, political connections with the control of public company have positive effect on Return on Assets. It shows that political connection in the public company has positive effect on firm value only at major ownerships (majority shareholder) so that it has a greater control on the decisions making. Meanwhile, political connections in the companies controlled by financial institutions have negative effect on both the Tobins'Q and ROA at the all cut off from 10% to 50%. This results show that financial institutions in the conglomerate are not able to control the company, so that political connections cannot affect the firm value.
The results of present study revealed that political connection on the controlling family, state, and public companies has positive effect on the firm value in conglomerate in Indonesia. These results support the finding of Tian and Cheung (2013), where they only found positive effect of political connection on the controlling family. Given that the third hypothesis about the influence of political connections on companies controlled by the family, the State and public companies is clearly evidenced. As such, it implies that the controlling company can easily control the other parties and determine policies which provide benefit for them. They are also free to determine who may eventually occupy board of commissioners, an independent commissioner or chairman of commissioner who can provide benefits for their interests and companies. Thus, it is not surprising that the position of commissioners which has very vital function for a company is occupied by retired generals, high officials of state, both active and non-active government officials who lack of competence in their field. This finding is in line with the statement of Winters (2014), arguing that Indonesia is already falling into oligarchy, where the government is occupied by a group of wealthy political elites.

Oligarchy in Indonesia adjusts quickly to the new regime. When the old regime ("orde lama or old order") collapsed, the oligarchs in Indonesia adjusted quickly to the new regime (so-called "new order"). Through the process of transition and adaptation, Indonesia oligarchy held the power and had a good luck for more than 30 years under Suharto's administration. The greatest change in oligarchies during the new orde was that networks had become very rich elite and therefore its power resources also increased sharply. When the "new order" fell, oligarchs adapted itself to this era of reform for several weeks in 1998 and quickly turned into the time of restoration for the oligarchy. Oligarchy (elite network) in Indonesia persisted and had a high ability to adapt whenever there were changes in the shape, structure, or other government agencies (Winters, 2004).

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5. Conclusions

The results study on the effect of family block holder, the state and public companies on firm value (Tobin's Q & ROA), showed that the presence of large shareholders in the company motivates them to perform better monitoring of the management. The study also proved that a large shareholder at a rate higher ownership has a positive effect on firm value. Accumulated or concentrated ownership can serve as a corporate governance mechanism to better and more effectively monitor the management that would reduce conflicts of agency (Shleiver and Vishny, 1986; Anderson and Reeb, 2003; Konijn et al., 2013). Hence, the block holder of the company will have a positive impact on firm value.

The presence of political connection at the state and family-controlled company has positive effect on the firm value (Tobin's Q & ROA) at all cut off. It indicates that the ownership structure of companies has contribution to determine the political connections in the conglomerate. The family block holder and the state which have political connection, tend to dominate the board of commissioners so that they can make a deal with government officer and obtain the privileges from them (Chen et al., 2011).

The concentration of ownership in the company and family as controlling highest conglomerate in Indonesia as well as their involvement in politics implies that Indonesia has fallen into oligarchy state, in which the rules are held by a group of wealthy political elites. Various cases of bribery are widespread among the businessmen and the authorities in many cases. It leads to high-cost in economy, inefficiency and misallocation of the nation's resources, unfair competition, and disharmony in the social life which may reduce public confidence in the country and worsen the image of Indonesia in the international communities.

References

Ang, J.S., Ding, D.K. and Thong, T.Y. 2013. Political Connection and Firm Value. *Asian Development Review*, Vol. 30 (2), pp. 131–166. http://hdl.handle.net/11540/1620

Arifin, Zaenal. 2003. *Agency Problems and Mechanism of Company Control with Concentrated Ownership Structure Controlled Families: Evidence from a Public Company in Indonesia*, Dissertation, Graduate Program, University of Indonesia: Depok. Retrieved from Library of University Indonesia. http://lib.ui.ac.id/

Anderson, R.C. and Reeb, D.M. 2003. Founding-family ownership and firm performance: evidence from the S&P 500. *The Journal of Finance*, 58(3), pp.1301-1328. https://doi.org/10.1111/1540-6261.00567

Boubakri, N., Cosset, J.C. and Saffar, W. 2008. Political connections of newly privatized firms. *Journal of Corporate Finance*, 14(5), pp.654-673. https://doi.org/10.1016/j.jcorpfin.2008.08.003

Chaney, P.K., Faccio, M. and Parsley, D. 2011. The quality of accounting information in politically connected firms. *Journal of Accounting and Economics*, 51(1-2), pp.58-76. https://doi.org/10.1016/j.jacceco.2010.07.003

Chen, C.J., Li, Z., Su, X. and Sun, Z. 2011. Rent-seeking incentives, corporate political connections, and the control structure of private firms: Chinese evidence. *Journal of Corporate Finance*, 17(2), pp.229-243. https://doi.org/10.1016/j.jcorpfin.2010.09.009

Claessens, S., Djankov, S. and Lang, L.H. 2000. The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, 58(1-2), pp.81-112. https://doi.org/10.1016/S0304-405X(00)00067-2

Cooper, M.J., Gulen, H. and Ovtchinnikov, A.V. 2010. Corporate political contributions and stock returns. *The Journal of Finance*, 65(2), pp.687-724. https://doi.org/10.1111/j.1540-6261.2009.01548.x

Deng, X., Tian, Z., Li, J. and Abrar, M. 2012. The diversification effects of a firm's political connection and its performance implications: Evidence from China. *Chinese Management Studies*, 6(3), pp.462-487. https://doi.org/10.1108/17506141211259140

Dicko, S. 2017. Political connections, ownership structure and quality of governance. *International Journal of Managerial Finance*, *13*(4), pp.358-377. https://doi.org/10.1108/IJMF-01-2017-0010

Do, Q.A., Lee, Y.T. and Nguyen, B.D. 2015. *Political connections and firm value: Evidence from the regression discontinuity design of close gubernatorial elections*. http://dx.doi.org/10.2139/ssrn.2023191

Faccio, M., Lang, L.H. and Young, L. 2001. Dividends and expropriation. *American Economic Review*, 91(1), pp.54-78. http://dx.doi.org/10.1257/aer.91.1.54

Faccio, M. 2006. Politically connected firms. *American Economic Review*, 96(1), pp.369-386. http://dx.doi.org/10.1257/000282806776157704

Fan, J. P., Wong, T. J., & Zhang, T. 2007. Politically Connected CEOs, Corporate Governance, and Post-IPO Performance of China's Newly Partially Privatized Firms. *Journal of Financial Economics*, *84*(2), pp. 330-357. https://doi.org/10.1016/j.jfineco.2006.03.008

Fisman, R., 2001. Estimating the value of political connections. *American Economic Review*, 91(4), pp.1095-1102. http://dx.doi.org/10.1257/aer.91.4.1095

Goldman, Eitan, Jorg Rocholl, dan Jongil So. 2009. Do Politically Connected Boards Affect Firm Value? *Review of Financial Studies* 22, pp. 2331-2360. https://doi.org/10.1093/rfs/hhn088

Isik, O. and Soykan, M.E. 2013. Large shareholders and firm performance: Evidence from Turkey. *European Scientific Journal*, ESJ, 9(25). Pp. 23-37. http://dx.doi.org/10.19044/esj.2013.v9n25p%25p

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), pp. 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Johnson, S. and Mitton, T. 2003. Cronyism and capital controls: evidence from Malaysia. *Journal of financial Economics*, 67(2), pp.351-382. https://doi.org/10.1016/S0304-405X(02)00255-6

Khanna, Tarun and Krishna Palepu. 1999. Emerging Market Business Groups, Foreign Investors, and Corporate Governance, *National Bureau of Economic Research Working Paper*, Retrieved from http://www.nber.org/papers/w6955.

Kim, Sung Suk. 2006. *Simultaneous Relationship between Ownership Structure, Corporate Governance, and Firm Values from the Jakarta Stock Exchange*. Dissertation, Graduate Program, University of Indonesia: Depok. Retrieved from Library of University Indonesia. https://doi/org/10.21002/seam.v2i1.5572

Konijn, S.J., Kräussl, R. and Lucas, A. 2011. Blockholder dispersion and firm value. *Journal of Corporate Finance*, 17(5), pp.1330-1339. https://doi.org/10.1016/j.jcorpfin.2011.06.005

La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. 1999. Corporate ownership around the world. *The Journal of Finance*, 54(2), pp.471-517. https://doi.org/10.1111/0022-1082.00115

Leuz, C. and Oberholzer-Gee, F. 2006. Political relationships, global financing, and corporate transparency: Evidence from Indonesia. *Journal of Financial Economics*, 81(2), pp.411-439. https://doi.org/10.1016/j.jfineco.2005.06.006

Li, W., He, A., Lan, H. and Yiu, D. 2012. Political connections and corporate diversification in emerging economies: Evidence from China. *Asia Pacific Journal of Management*, 29(3), pp.799-818. https://link.springer.com/article/10.1007/s10490-011-9265-5

Li, A., dan Xia, X. 2013. Political connections, financial crisis and firm's value: Evidence from Chinese Listed Firms. *International Journal of Business and Management*, 8(18), pp. 63. https://doi.org/10.5539/ijbm.v8n18p63

Lukviarman, N., 2004. *Ownership structure and firm performance*: the case of Indonesia. Doctoral dissertation. Curtin University. Retrieved from https://espace.curtin.edu.au/handle/20.500.11937/1268

Niessen, A. and Ruenzi, S. 2010. Political connectedness and firm performance: Evidence from Germany. *German Economic Review*, 11(4), pp.441-464. https://doi.org/10.1111/j.1468-0475.2009.00482.x

Pirzada, K. 2016. Providers and Users' Perception Of Voluntary Need Of Human Resource Disclosure: A Content Analysis. *Polish Journal of Management Studies*, *14*(2), pp.232-242. https://doi.org/10.17512/pjms.2016.14.2.22

Pirzada, K., Mustapha, M.Z.B. and Wickramasinghe, D. 2015. Firm Performance, Institutional Ownership and Capital Structure: A Case of Malaysia. *Procedia-Social and Behavioral Sciences*, *211*, pp.170-176. https://doi.org/10.1016/j.sbspro.2015.11.025

Siregar, B., 2008. Expropriation of minority shareholders in the ultimate ownership structure. *Jurnal Riset Akuntansi Indonesia*, 11(3), pp.237-263.

Shleifer, A. and Vishny, R.W. 1986. Large shareholders and corporate control. *Journal of Political Economy*, 94(3, Part 1), pp.461-488. https://www.journals.uchicago.edu/doi/abs/10.1086/261385

Shleifer, A. and Vishny, R.W. 1997. A survey of corporate governance. *The Journal of Finance*, 52(2), pp.737-783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

Tian, L. and Cheung, W. 2013. Political Connections, Controlling Shareholders and Post-IPO Performance of China's Listed Companies. Institute of Finance and Development. Nankai University. Retrieved from https://web.iss.u-tokyo.ac.jp/kyoten/activities/paper_April24th.pdf

Wati, M. L. N., Primiana, I., & Sudarsono, R. 2015. Political connections and controlling shareholder on Indonesia conglomerates. *Proceedings of International Conference on Advanced Research Business and Social Sciences (ICARBSS) 2015 Kuala Lumpur, Malaysia*, pp 133-142. http://www.academia.edu/download/41317352/PROCEEDINGS_ICARBSS-2015.pdf#page=133

Wati, L.N., Rachmat Sudarsono, S.E., Si, M. and Erie Febrian, S.E. 2016. Corporate governance on conglomerates pollitically connected. *International Journal of Business, Economics and Law*, 10(1), pp.23-31.

Wati, L.N., Primiana, I. and Sudarsono, R. 2016. Political connections of conglomerates: evidence form Indonesia Stock Exchange. *Actual Problems of Economics*, (12), pp.110-119. http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_meta&C21COM=S&2_S21P03=FILA=&2_S21STR=ape_2016_12_14

Wati, L. N. 2017. Board of commissioner's effectiveness on politically connected conglomerates: Evidence from Indonesia. *Pertanika Journal Social Sciences & Humanities*, 25(S), pp. 255-270. http://www.pertanika.upm.edu.my/view_archives.php?journal=JSSH-25-S-11

Winters, A., Jeffrey. 2004. *Orba jatuh, Orba bertahan?* Indonesia. Djambatan Publisher. https://www.scholars.northwestern.edu/en/publications/orba-jatuh-orba-bertahan-indonesias-new-order-falls-endures-an-an

Winters, A., Jeffrey. 2014. *Democracy under Clutches Oligarchy.* Edisi Vol.33 No. 1. Indonesia. Majalah Prisma.

Wiwattanakantang, Y., 2001. Controlling shareholders and corporate value: Evidence from Thailand. *Pacific-Basin Finance Journal*, 9(4), pp.323-362. https://doi.org/10.1016/S0927-538X(01)00022-1

Wong, S.H.W. 2010. Political connections and firm performance: The case of Hong Kong. *Journal of East Asian Studies*, 10(2), pp.275-314. https://doi.org/10.1017/S1598240800003465

Wu, W., Wu, C., Zhou, C. and Wu, J. 2012. Political connections, tax benefits and firm performance: Evidence from China. *Journal of Accounting and Public Policy*, 31(3), pp.277-300. https://doi.org/10.1016/j.jaccpubpol.2011.10.005

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FINANCIAL ANALYSIS OF INNOVATIVE FORMS OF MONEY*

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Abstract. The identification and financial analysis of property suspected to constitute proceeds of crime is a difficult activity that must be carried out before such assets can be frozen, seized or confiscated. The lawful seizure of assets as the enforcement of a sentence or a protective measure, or for satisfaction of a claim for damages, requires that the assets be secured in a way that prevents them being placed outside the public authorities' control and limits the potential for the laundering of funds and their use in further crimes. Effective identification and analysis depends on the active and effective detection and documentation of both the direct proceeds and indirect benefits of crime, their location, character, status and value, the prevention of changes in the persons who have ownership or disposal rights to the assets as well as determination of the total assets of the accused (suspect). The aim of the present paper is to focus attention on the financial analysis of selected assets related to financial markets and new forms of money. It should be emphasised that as technology evolves, it is mirrored by innovation in financial markets and equal development of financial analysis focusing on innovative forms of money. The basic indicator with the greatest significance for financial analysis is regulation and especially whether it covers the relevant forms of money. If they are subject to regulation (in this case by the central bank), they are easier to identify and secure. Things are different if they are not directly regulated by legislation or if they not subject to supervision.

Keywords: financial analysis; property; seizure; confiscation; freezing; financial market; innovative forms of money

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1. Introduction

Finding out the extent of the assets of suspects and accused persons, including those in innovative forms, is one of the basic preconditions for successful organized crime suppression. Organized crime as phenomenon affects significantly security of society and is among threats to sustainable development processes (e.g. Luzgina, 2017; Kuril 2018; Čentéš et al. 2018; Jurkevičius, Pokhodun 2018; Osipov et al. 2018; Mikhaylov et al. 2018; Tvaronavičienė 2018; Finogentova et al. 2018).

The assets of an accused person (suspect) can vary in their character, form, location, origin etc. Every identification procedure is unique and depends on the individual facts of the case (crime), the person of the accused (suspect) and so on. The approach to identification is pragmatic because its purpose is to facilitate steps for the freezing, seizure and confiscation of assets as security in case of a sentence or a protective measure or for their enforcement, or to pay compensation for damages (Čentéš et al. 2013). Measures to identify the origin of assets also investigation its links to the perpetrated crime.

An important tool in this regard is the property profile, which is a set of information on tangible and intangible assets owned by a given natural person or legal entity. The property profile is one of the outputs of financial analysis. The procedure for determining the property profile follows the logical procedure presented by regulatory conditions and the available evidence. This means that checks focus on all available record systems from which it possible to identify any right to property. The main general types of assets are recorded in the following systems:

1. real estate – registered by the cadastral authorities, specifically the Geodesy, Cartography and Cadastre Authority of the Slovak Republic and the district offices (Sections 2, 68 and 69 of Act No. 162/1995 on the real estate cadastre and on registration of ownership and other rights over real estate (the Cadastral Act), as amended),
2. relations under financial law and the law of commercial obligations
    - with banks based in the Slovak Republic, with branches of foreign banks, with building savings banks – registered in the banking system, subject to regulation - current accounts, payment cards, loans, safe deposit boxes, bank contracts etc. (Sections 38a(4), 91(4)(g) and (b) of Act No. 486/2001 on banks and amending certain acts, as amended, Act No. 310/1992 on building savings, as amended),
    - insurance relationships – registered by insurance companies: life insurance – investment life insurance, extraordinary life insurance deposits, single instalment life insurance, non-life insurance (Sections 72(3), 166 of Act No. 39/2015 on insurance and amending certain acts, as amended),
    - with leasing companies,
    - within the context of collective investments managed by fund management companies: mutual fund administration, mutual funds – open, closed, special (Section 162(3) of Act No. 203/2011 on collective investment, as amended),
    - dealing in securities and ownership of securities: registered securities, order securities, bearer securities etc. – the Central Securities Depository, a member and a dealer in securities (Sections 110(1), 134(3) of Act No. 566/2001 on securities and investment services and amending certain acts, as amended, section 17(3) of Act No. 429/2002 on the stock exchange, as amended),
3. ownership relations
    - ownership share in commercial companies and cooperatives – companies register,
    - motor vehicles, boats and aeroplanes – vehicle register
    - firearms – firearms register
    - items of historical, archaeological, collectible and artistic significance,
    - precious metals, precious stones,
    - other movable assets,
    - assets involving intellectual property rights,
    - receivables,
4. income and fulfilment of tax and levy obligations,

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5. cash and the like.

Detailed information is obtained on the given ownership rights. For example, a financial institution could provide the precise identification of a financial instrument, the type of financial institution, its identification data, the number of the instrument, the relationship of the suspect (owner, co-owner, co-signer), the status and value of the asset.

The investigation must differentiate between assets acquired legally (e.g. income from employment, inheritance etc.) and assets that are proceeds of crime.

Financial analysis of assets does not consider only the aforementioned financial identification but also acquires and documents information on the circumstances and lifestyle of the natural person (family relationships, place of residence etc.) and information on whether their assets are proceeds of crime or whether they are related to money laundering (Section 2 of Act No 297/2008 on prevention of the legalisation of proceeds of crime and protection against terrorist financing, and amending certain acts, as amended). This primary activity is especially important and makes a substantial contribution to the decisions on further actions of law enforcement authorities and the courts in criminal proceedings. Financial analysis can therefore be understood as the process of tracing and documenting all assets and all proceeds of crime for the preparation of a property profile of a natural person or legal entity using the available databases, information systems, open sources and the operational activities of public authorities. Common indicators include crime reports, information from media and internet monitoring and information acquired based on personal and local knowledge.

2. Financial analysis in the context of European Union legislation

A fundamental issue for the subject-matter of the present paper is cross-border organised crime for financial gain. This financial gain is a stimulus for committing further crime for additional profit. Law enforcement services must have the necessary skills and information for the documentation of such crimes if they are to be successfully traced and investigated. To combat organised crime effectively, information that can lead to the tracing, identification and seizure of proceeds from crime and other property belonging to criminals has to be exchanged between the Member States of the European Union with no delay. These trends towards cooperation are part of the gradual harmonisation of both procedural and substantive criminal law of EU member states, which is one of the basic objectives laid down by the founding treaty (Streinz et al., 2018) - under Article 82(2) of the Treaty on the Functioning of the European Union, directives establish minimum rules to facilitate mutual recognition of judgments and judicial decisions and police and judicial cooperation in criminal matters having a cross-border dimension.

The development of the legislative framework also built upon the Hague Programme (Ten priorities for the next five years) of 2004, in which the Commission advocated strengthening the tools for addressing financial aspects of organised crime, including support for the establishment of criminal asset intelligence units in EU Member States.

Financial analysis has a transnational dimension. Council Decision 2007/845/JHA concerning cooperation between Asset Recovery Offices of the Member States in the field of tracing and identification of proceeds from, or other property related to, crime provided for the establishment of Asset Recovery Offices on the national level. Every Member State would set up or designate a national entity to act as an Asset Recovery Office (ARO) for the purposes of the facilitation of the tracing and identification of proceeds of crime and other crime related property which may become the object of a freezing, seizure or confiscation order made by a competent judicial authority in the course of criminal proceedings. The office would exchange information not only on request but could also do so spontaneously. Alongside the basic purpose of the AROs, a secondary purpose is to use the platform to exchange best practices concerning ways to improve the effectiveness of Member States' efforts in tracing and

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identifying proceeds from, and other property related to, crime in specific cases. Cooperation between the offices in EU Member States in tracing such proceeds and property can also be supported by the amendment of national legislation.

The ARO is the executive (operational) unit for functions resulting from Council Decision 2007/845/JHA in accordance with the procedures and time limits provided for in Council Framework Decision 2006/960/JHA, which lays down rules for the execution and provision of documentation and information for the needs of the members of the international network of agencies concerned with the cross-border identification, freezing, seizure and confiscation of the proceeds of crime and other crime related property. Implementation of this framework decision is one of the means of compensating for the absence of controls on persons at the internal borders between Member States (see the Opinion of the Advocate General Ján Mazák of 07 June 2010 in Melki and Abdeli, C 188/10 and C 189/10, ECLI:EU:C:2010:319, point 38). It has a broader scope however: it contributes to the investigation of any crime with a cross-border element for which standard physical border checks would not be applicable.

The basic functions performed by the asset analysis department in accordance with the procedures laid down in Council Framework Decision 2006/960/JHA include cooperation and exchange of information and intelligence with partner AROs in other EU Member States. The provision of information is limited to what is deemed relevant and necessary for the successful detection, prevention or investigation of the crime or criminal activity in question.

A prior request for information or intelligence (Articles 3, 4 and 5 of Council Framework Decision 2006/960/JHA of 18 December 2006 on simplifying the exchange of information and intelligence between law enforcement authorities of the Member States of the European Union) is not always needed for the exchange of information, and information may be provided spontaneously via existing communication channels for international cooperation. Spontaneous provision of information and intelligence from a competent body in one EU Member State to a competent body in another EU Member State without a prior request shall be restricted to cases where there are factual reasons to believe that the information and intelligence could assist in the detection, prevention or investigation of offences referred to in Article 2(2) of Framework Decision 2002/584/JHA. For the purposes of criminal proceedings, if information is exchanged based on a request, the requesting EU Member State must request the information through legal assistance channels (in the Slovak Republic, this means via the Prosecutor General of the Slovak Republic)

Information exchange and cooperation with third countries is conducted via the Camden Assets Recovery Inter-Agency Network (CARIN) established at The Hague on 22-23 September 2004 by Austria, Belgium, Germany, Ireland, Netherlands and the United Kingdom. CARIN is a global network of practitioners and experts with the intention of enhancing mutual knowledge on methods and techniques in the area of cross-border identification, freezing, seizure and confiscation of the proceeds from, and other property related to, crime.

The ARO uses the initiative under the Framework Decision for the rapid and effective exchange of information and intelligence that can be used as evidence in criminal proceedings though only with the consent of the competent authority in the state that provided it. Otherwise, it must be treated only as intelligence and used only for intelligence purposes. Such consent is not required if the requested Member State has already given its consent for the use of information / intelligence as evidence at the time of sending.

Information and intelligence include:
- any type of information or data which is held by law enforcement authorities and
- any type of information or data which is held by public authorities or by private entities and which is available to law enforcement authorities without the taking of coercive measures (Article 2(d) of Council Framework

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Decision 2006/960/JHA of 18 December 2006 on simplifying the exchange of information and intelligence between law enforcement authorities of the Member States of the European Union).

The ARO, as part of the property analysis department provides for and implements service tasks for the financial police and criminal police. Its main function in the context set out above is to search and collect information for law enforcement authorities, other parts of the Police Force and foreign partner units, primarily in the economic and financial areas important for the identification of the proceeds of a given crime. This information is as a rule exclusively of an intelligence nature and used in further proceedings for the confiscation of property, or in an order issued by a competent judicial authority for the freezing, seizure or confiscation of the property during criminal proceedings. International cooperation and exchange of information between national AROs is carried out in accordance with the Council Framework Decision on simplifying the exchange of information and intelligence between law enforcement authorities of the Member States of the European Union (Council Framework Decision 2006/960/JHA).

The Commission implementation reports on Framework Decisions 2003/577/JHA, 2005/212/JHA and 2006/783/JHA show that existing regimes for extended confiscation and for the mutual recognition of freezing and confiscation orders are not fully effective. Negative aspects in practical application in the past gave rise to difference in the national law of EU Member States. The problem of deficiencies in proceedings against money laundering (especially inadequacies in the confiscation of assets during criminal proceedings, inadequate application of procedural aspects) was also negatively perceived in the wider context of OECD countries (Gray et al. 2014). In response, the European Union adopted Directive 2014/42/EU of the European Parliament and of the Council of 3 April 2014 on the freezing and confiscation of instrumentalities and proceeds of crime in the European Union (hereinafter, Directive 2014/42/EU). This directive was transposed by providing for the mutual execution of decisions on property in criminal proceedings in EU Member States (Act No. 316/2016 on the recognition and execution in the European Union of decisions on property and amending certain acts).

The proceeds of crime include not only direct proceeds but also any indirect benefits, including subsequent reinvestment or transformation of direct proceeds. Thus, proceeds can include any property including that which has been transformed or converted, fully or in part, into other property, and that which has been intermingled with property acquired from legitimate sources. The directive in question extends the understanding of property that may be subject to seizure or confiscation. Confiscation can take standard and extended forms and confiscation may also apply to property that has already been transferred to a third party or directly acquired by a third party who could ascertain that it is a proceed of crime.

For the topic of the present paper, a key provision is Article 5 of Directive 2014/42/EU, which regulates the use of extended confiscation of property, and which states that to fight effectively against organised crime it is sometimes appropriate that a person convicted of a criminal offence should be deprived not only of the property associated with the crime in question but also of other property that probably constitutes the proceeds of other crimes. Directive 2014/42/EU builds on the earlier Council Framework Decision 2006/783/JHA of 06 October 2006 on the application of the principle of mutual recognition to confiscation orders, whose text it supplements and clarifies based on the experience of Member States in applying this framework decision, and strengthens the harmonisation of national arrangements to eliminate obstacles to effective international cooperation.

Article 5 of Directive 2014/42/EU establishes an obligation for EU Member States to adopt the necessary measures to enable the confiscation, either in whole or in part, of property belonging to a person convicted of a criminal offence which is liable to give rise, directly or indirectly, to economic benefit, where a court, on the basis of the circumstances of the case, including the specific facts and available evidence, such as that the value of the property is disproportionate to the lawful income of the convicted person, is satisfied that the property in question is derived from criminal conduct. Extended confiscation could be imposed in cases where, on the basis of all the

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facts of the case in question, the court is satisfied that the property or a part thereof constitutes the proceeds of an undetected crime.

The confiscation of such a part of the property is necessary to protect society from further crime. In this sense, extended confiscation has a preventive and protective character. This follows from the fact that the state is entitled to confiscate any property that has been acquired through crime to protect against recidivism of the offenders while also deterring potential offenders.

Member States are obliged to implement extended confiscation for crimes involving corruption (This means active and passive corruption in the private sector, as provided for in Article 2 of Framework Decision 2003/568/JHA, as well as active and passive corruption involving officials of institutions of the Union or of the Member States, as provided for in Articles 2 and 3 respectively of the Convention on the fight against corruption involving officials), participation in a criminal organisation (Offences relating to participation in a criminal organisation, as provided for in Article 2 of Framework Decision 2008/841/JHA, at least in cases where the offence has led to economic benefit), crimes related to child pornography (Causing or recruiting a child to participate in pornographic performances, or profiting from or otherwise exploiting a child for such purposes if the child is over the age of sexual consent, as provided for in Article 4(2) of Directive 2011/93/EU; distribution, dissemination or transmission of child pornography, as provided for in Article 5(4) of that Directive; offering, supplying or making available child pornography, as provided for in Article 5(5) of that Directive; production of child pornography, as provided for in Article 5(6) of that Directive), computer crimes (Illegal system interference and illegal data interference, as provided for in Articles 4 and 5 respectively of Directive 2013/40/EU, where a significant number of information systems have been affected through the use of a tool, as provided for in Article 7 of that Directive, designed or adapted primarily for that purpose; the intentional production, sale, procurement for use, import, distribution or otherwise making available of tools used for committing offences, at least for cases which are not minor, as provided for in Article 7 of that Directive) and criminal offences punishable in accordance with Article 3 of Directive 2014/42/EU or, if the instrument in question does not contain a penalty threshold, in accordance with the relevant national law, by a custodial sentence of a maximum of at least four years.

These offences constitute the minimum scope in which extended confiscation can be applied when complying with the legal basis on the European Union level and EU Member States are encouraged to consider adopting wider application.

It is noteworthy that EU Member States have incorporated the provisions of Article 5 of Directive 2014/42/EU into their legal systems in various ways. Most EU Member States have incorporated the extended confiscation of property into the Criminal Code and the Code of Criminal Procedure (e.g. Sweden, the Netherlands, Hungary, Lithuania, Austria, Romania, Denmark, Estonia), or into the Criminal Code and related tax regulations (Poland) so that a court decides on its application when passing sentence, e.g. imposing a sentence of forfeiture of property or a penal measure, or in a subsequent decision issued in criminal proceedings. In this type of arrangement, conviction of the accused for a criminal offence is a necessary condition for the imposition of extended confiscation. In this sense, it is impossible to separate its imposition from the criminal proceedings on guilt and punishment.

A smaller number of EU Member States has implemented extended confiscation in non-criminal (civil) law authorising the confiscation of property probably derived from illegal activity (including the Slovak Republic). This means that confiscation is no longer dependent on a conviction if the property is probably derived from illegitimate sources and there are indications of illegal activity such as criminal conduct or tax violations.

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Another significant provision of Directive 2014/42/EU is Article 2(2), which defines "property" as any property of any description, whether corporeal or incorporeal, movable or immovable, and legal documents or instruments evidencing title or interest in such property. Directive 2014/42/EU thus understands property to include legal documents and instruments demonstrating ownership or other rights in relation to, for example, financial instruments, or other documents that that may give rise to creditor claims and are normally found in the possession of the person affected by the relevant procedures. This influences the issue of ownership of so-called financial innovations.

Another important legal document is Directive (EU) 2015/849 of the European Parliament and of the Council on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing (Directive 2015/849/EU). This directive is known as the fourth directive and addresses the threat of money laundering. The directive has been transposed into Act No 297/2008 on prevention of the legalisation of proceeds of crime and protection against terrorist financing, and amending certain acts, as amended.

In the context of financial analysis, the important factors are the stability of the financial system, the level of the financial sector and the security of the European Union's internal market. The primary aim of the directive is to prevent the misuse of the financial system to channel money to illegal activity or money derived from illegal activities. Despite the directive's limitation to the area of money laundering and terrorist financing, the document itself highlights its potential impact on tax crimes. It is necessary to allow the greatest possible extent of the exchange of information or provision of assistance between EU Financial Intelligence Units (FIUs).

A benefit of the directive is the highlighting of other types of financial operations that have a suspicious or unusual character, to which it could be argued that several innovative forms of money should be assigned from a practical point of view. It is not unusual for some of them to be linked to money laundering, terrorist financing or other illegal criminal activity.

In the context of this directive, it is worth highlighting Section 29a of Act No. 171/1993 on the Police Force, as amended, under which a police officer serving in the financial police or the criminal investigation police is entitled to send a written request to banks or branches of foreign banks for a report on a client of the bank or branch of a foreign bank including information subject to bank secrecy, although only in an exhaustively defined set of conditions (Section 91(4)(g) of Act No 483/2001 on banks and amending certain acts, as amended) indicating that such a report is necessary for the investigation of tax evasion, illegal financial operations or money laundering and related crimes and their perpetrators under Section 2(1)(b) and (c) of the Act on the Police Force. In pre-trial proceedings such information can also be requested by a prosecutor or a police office, subject to the prosecutor's consent, and during judicial proceedings it can be requested by the presiding judge based on Section 3(5) of Act No. 301/2005, the Code of Criminal Procedure, as amended (Čentéš et al. 2016).

A deficiency of this system is that although Directive 2015/849/EU lays down an obligation to set up a central register of accounts, no such central register of bank accounts exists in the Slovak Republic and the current procedure for obtaining information subject to bank secrecy is inefficient and time-consuming because written requests must be sent to every bank and branch of a foreign bank. It should be noted that the delay in the delivery of such information does not facilitate the immediate seizure of the proceeds of crime. Furthermore, there is no way to monitor movements on accounts in banks and branches of foreign banks online. The current system is bureaucratic and costly, wastes human resources by requiring staff involvement and imposes similar burdens on the banks. For completeness, it should be noted that Article 67 of Directive 2015/849/EU gives Member States until 26 July 2017 to bring into force the laws, regulations and administrative provisions necessary to comply with the Directive.

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The staff of the ARO make written requests for information to institutions outside the competence of the Ministry of Interior of the Slovak Republic including financial institutions such as banks, insurance companies and fund management companies. If these institutions do not comply with the deadlines for providing information, staff can, in addition to sending reminders by letter or e-mail, impose a penalty in the form of a civil fine.

In the legal systems of other countries, this issue is usually dealt with by the FIU and in the Slovak Republic such activities are primarily carried out by the Financial Intelligence Unit, whose achievements have been publicised and reported in the media (e. g. Final report on the National Risk Assessment for Money Laundering and Terrorist Financing, 2017). It is also the national body for tracing the proceeds of crime and other crime related property that could be subject to a freezing or confiscation order. Timely access to accurate and up-to-date information and intelligence is vital for the successful detection, financial analysis, prevention and investigation of crimes.

3. Innovative forms of money and their financial analysis

Turning to the financial analysis of financial market instruments (Kohajda, 2015) or innovative forms of money (Babčák 2012), one feature that stands out is the high level of sophistication involved. The basic principle for the detection is whether they are subject to regulation and therefore whether they are directly or indirectly recorded. If evidence is obtained in the form of records of the acquisition of title to such assets, the analytical activity of the competent authorities will adapt to it. The significance and purpose of financial analysis nevertheless also requires the acquisition of information on so-called unsupervised financial innovations which, as their name suggests, are outside the scope of regulation. In this case, it is essential to identify and locate them, to determine their value and, if possible, to determine if they are the proceeds of legal, illegal or borderline legal activity. Subjects naturally try to make them appear legal and it can therefore be difficult to detect their legal method of acquisition and/or their connection to other activities. It is a difficult challenge for the financial analysis of innovative forms of money and instruments to trace such assets in the global system of financial operations and financial markets.

The implementation of digitalisation and innovative technologies in the financial market to provide new services and instruments is referred to as fintech, which is short for financial technologies. This new industry has created many innovative methods for providing financial services, mainly via the internet, which can be described as financial innovations or innovative forms of money. Logically not all of them exist only in online form. This area of interest includes not only new instruments but also payment systems such as mobile cash payment systems. Two phenomena that authorities are still getting to grips with are crowdfunding (Pichler and Tezza 2016) and the use of cryptocurrencies. Čunderlík (2017) defines crowdfunding as the deliberate collection of funds via online platforms from a large number of usually non-expert investors and subdivides the phenomenon into the following known sub-types:

- Reward-based crowdfunding,
- Gift-based crowdfunding,
- Ownership-based crowdfunding,
- Debt crowdfunding
- Debt crowdfunding with profit sharing,
- Peer-to-peer debt crowdfunding.

The use of the financial technologies mentioned above is also associated with a new type of database called a blockchain (which is being considered for use in other sectors), with virtual “currencies” and payment systems such as bitcoin and other cryptocurrencies. It must be emphasised that not all activities can automatically be considered suspicious and when creating a property profile, all the above factors must be considered. An example is the IronX virtual exchange, which is licensed by the Estonian FIU and is the first institution of its type to gain such a licence and the full confidence of a regulator.

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On the other hand, there is a significant factor that links some forms of financial technology to crime: their ability to increase anonymity. This factor is augmented by certain networks that negate the ability to link an IP address and cryptocurrency transactions. It is not unusual to use third parties to open accounts so that criminal organisations can misuse a cryptocurrency. These techniques can be used to launder illegally acquired money (E.g. the investigation of a money laundering operation in Moldova that laundered around 22 billion USD), do business on the darknet, buy drugs and so on. For example, the Estonian Supreme Court handed down a judgement stipulating that bitcoin brokerages must be subject to anti-money-laundering supervision by the FIU.

For completeness, another connection that should be mentioned has been noted by the monitoring authority in Canada, which has begun an investigation of a crowdfunding platform with a link to terrorists and it highlights the need to verify and identify such transactions because the obligatory reports that financial institutions submit do not provide relevant information about this operation type. Their volume is below the statutory limit for the transfer of information (and could thus be said to "fly below the radar"), and they thus create a higher level of risk.
There is often a lack of regulatory oversight for financial innovations, which means that they often lack a mechanism for the clear measurement of risk in their operations, for the detection of links to specific criminal activity, for the financial analysis of such property and so on. As undesirable activities increase, the financial systems are undermined and there are greater flows on the illegal level. In the present context, new online platforms are emerging that can contribute to a loss of clarity in financial analysis and the preparation of property profiles. It must be emphasised that the FIU is undoubtedly paying attention to financial innovations and modifications can be made to platform procedures to allow make these innovations more legible. These suspicious financial operations are usually considered when there are links to serious crimes, with priority being given to money laundering and terrorist financing.

4. Conclusion

The stability of credit and financial institutions could be put at risk, with dangerous consequences for confidence in the financial system, by the efforts of criminals to conceal the source of the proceeds of crime and other crime related property to prevent its detection and their consequent freezing, seizure and confiscation by public authorities. The authorities' actions are intended to deter crime and to prevent further laundering of the proceeds of crime, the commission of further crime and the use of proceeds of crime for terrorist financing. The severity of such crimes is highlighted by the fact that the perpetrators are misusing the free movement of capital and the free provision of financial services, which are pillars of the European Union's single financial market. The harmonisation of procedural criminal law in EU Member States is intended to suppress such criminal activity. To maintain balance, it is necessary to obtain more information on unsupervised financial innovations while providing a regulatory environment that permits companies to develop their own businesses without disproportionate compliance costs in the given area.

The effective prosecution of criminals who have profited from crime requires that EU Member States fully transpose the relevant EU directives into national law. A current issue is the transposition of Article 5 of Directive 2014/42/EU on extended confiscation of property that allows a convicted person to be deprived not only of the property acquired through the crime in question but also of other property that probably derives from criminal activity. Such provisions are needed in law and practice to prevent additional crimes from being committed.

It is also necessary to increase the attention paid to the identification of financial innovations – the innovative forms of financing now appearing in financial markets – many of which fall outside the remit of standard forms of regulation and are therefore de jure and de facto impossible for traditional procedures to identify, detect and, most importantly, link to their owners. The space created by the absence of regulatory instruments for detection can be used to commit further illegal and unlawful activities that will be difficult to investigate because of the lack of

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clear connections. The innovative forms of money and operations that we consider most relevant are cryptocurrencies and crowdfunding, along with other fintech instruments. Digitalisation is an incredibly dynamic process in financial markets and actors exploit not only the absence of control mechanisms but also the existence of loopholes in legislation. In many cases, as set out above, partial identification depends on European and international police platforms that are incomplete and not available to all relevant actors. For this reason, the FIU is currently dedicating more resources to the identification of financial innovations, procedures for exchanging information and the detection of suspicious financial operations. An important step for the future, also with reference to the MONEYVAL evaluation, is to focus attention on the detection and identification of innovative forms of money that are open to misuse in sophisticated criminal activity.

References:

Act No 171/1993 on the police Force, as amended.

Act No 297/2008 on prevention of the legalisation of proceeds of crime and protection against terrorist financing, and amending certain acts, as amended.

Act No 483/2001 on banks and amending certain acts, as amended.

Act No. 300/2005, the Criminal Code, as amended.

Act No. 301/2005, the Criminal Procedure Code, as amended.

Babčák, V. et al. 2013. Finančné právo na Slovensku a v Európskej únii. [Financial law in Slovakia and the European Union] Bratislava: Eurokódex, s.r.o. 2012, 832 p.

Čentéš, J. et al. 2013. Trestný zákon – Veľký Komentár. [Criminal Code - Great Commentary] Žilina: Eurokódex, 1008 p.

Čentéš, J.; Mrva, M.; Krajčovič, M. 2018. The process of individualisation of punishment in insolvency crimes, *Entrepreneurship and Sustainability Issues* 6(2): 603-619. http://doi.org/10.9770/jesi.2018.6.2(10)

Čentéš, Jozef a kol. 2016. Trestné právo procesné. [Criminal procedural law] Heuréka, 496 p.

Council Framework Decision 2006/960/JHA of 18 December 2006 on simplifying the exchange of information and intelligence between law enforcement authorities of the Member States of the European Union

Čunderlík, Ľ. et al. 2017. Právo finančného trhu. [Financial market law] Bratislava: Wolters Kluwer, 260 p.

Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC (OJ L 141, 05/06/2015).

Directive 2014/42/EU of the European Parliament and of the Council of 3 April 2014 on the freezing and confiscation of instrumentalities and proceeds of crime in the European Union (OJ L 127. 29/04/2014).

Final report on the National Risk Assessment for Money Laundering and Terrorist Financing issued in 2017. Available at: https://www.minv.sk/swift_data/source/policia/fsj/SNV.pdf accessed on: 10 May 2019

Finogentova, O.; Tokarev, V.; Petrenko, M.; Primak, T. 2018. Acceptance criterion of state coercion in contemporary society, *Entrepreneurship and Sustainability Issues* 6(2): 820-829. http://doi.org/10.9770/jesi.2018.6.2(23)

Grey, L.; Hansen, K.; Recica-Kirkbride, P.; Mills, L. 2014. Few and Far. The Hard Facts on Stolen Asset Recovery. International Bank for Reconstruction and Development / The World Bank and the OECD http://documents.worldbank.org/curated/en/379871468146375164/Few-and-far-the-hard-facts-on-stolen-asset-recovery accessed on 10 May 2019

Hard to identify crowdfunding platforms financing terrorism, https://www.thestar.com/business/2017/05/18/hard-to-identify-crowdfunding-platforms-financing-terrorism.html , accessed on 10 May 2019

Jurkevičius, V.; Pokhodun, Y. 2018. The doctrine of apparent authority as a precondition for sustainable business, *Entrepreneurship and Sustainability Issues* 6(2): 649-661. http://doi.org/10.9770/jesi.2018.6.2(13)

Kohajda, M. 2015. Finanční trh a postavení klienta v rámci finančních služeb. Vybrané instituty finančního práva v roce 2014. [Financial market and client position in financial services. Selected Financial Law Institutes in 2014] Olomouc: Iuridicium Olomoucense

Luzgina, A. 2017. Problems of corruption and tax evasion in construction sector in Belarus, *Entrepreneurship and Sustainability Issues* 5(2): 263-282. https://doi.org/10.9770/jesi.2017.5.2(8)

Mikhaylov, A.S.; Mikhaylova A. A.; Savchina, O.V. 2018. Innovation security of cross-border innovative milieus, *Entrepreneurship and Sustainability Issues* 6(2): 754-766. http://doi.org/10.9770/jesi.2018.6.2(19)

Pichler, F., Tezza, I. 2016, Crowdfunding as a New Phenomenon: Origins, Features and Literature Review. Crowdfunding for SMEs. A European Perspective. Palgrave Macmillan Studies in Banking and Financial Institutions, 235 p.

Streinz Rudolf a kol. 2018 Vertrag über die Europäische Union, Vertrag über die Arbeitsweise der Europäischen Union, Charta der Grundrechte. München: C. H. Beck, 2873 p.

Tvaronavičienė, M. 2018. Toward efficient policy making: forecasts of vulnerability to external global threats, *Journal of Security and Sustainability Issues* 7(3): 591-600. https://doi.org/10.9770/jssi.2018.7.3(18)

World Drug report, https://www.unodc.org/wdr2016/ accessed on: 10 May 2019.

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PRODUCTION NETWORKS UNDER THE ASEAN PLUS SIX. A GOOD DEAL OR A THREAT?*

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Abstract. This study breaks up the gross trade of ASEAN countries into the different components of Value-added trade to analyze the integration of ASEAN into the Global Value Chain (GVC). The study employs a global input-output database using data by the years1997, 2004, and 2012. The research considers the possible effects of expanding ASEAN into an ASEAN Plus Six agreement from the Vertical Specialization point of view. Gross trade is further broken down into nine components of value-added trade which creates a series of indicators of value creation, participation-position in GVC, among others. The study found that ASEAN has made significant gains in enlarging total trade (235%), and thus undergoing a particularly faster growth in production sharing structures. Over the time, ASEAN has assumed a notable function across the GVC as a provider of value-added through parts and components (33%) than as a producer of final goods (30%). Vertical trade accounts for more than 43% of ASEAN gross exports, but it depends on foreign intermediate goods (35%) to produce its exports, most of them are supplied from Asia. ASEAN single production region has gained a little while it has grown with Asian partners and lost market share with NAFTA and Europe. The ASEAN Plus six leads to a broad range of integration and might translate to larger gains than Intra-ASEAN trade. While ASEAN is expanding faster regionally than globally, both in supplies and in demand, the ASEAN internal market might not be large enough to drive growth. Meanwhile the dynamics of ASEAN appear as being part of a strong GVC through Asia.

Keywords: vertical specialization; production networks; value-added trade; global input-output; ASEAN Six

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1. Introduction

The Association of Southeast Asian Nations (ASEAN) has actively promoted both regional and global liberalization and integration in the most recent years. Included in the main goals of the ASEAN are the free movement of services and goods, and investment across the region, the creation of a single production base able to compete globally, and its integration into the global economy (among others). Internally, ASEAN has achieved a large removal of tariffs and non-tariff barriers, engaged in trade facilitation programs, and worked in coordination, rules of origin, among other initiatives. However, Intra-ASEAN patterns of trade, while expanding fast, have remained similar to 2000 levels. The region seems to be supporting the extra-ASEAN integration more than building the Intra-ASEAN production base project.

At the same time, Asia is heading towards a more integrated region with the peculiarity of having a fragmented manufacturing structure under the pattern of vertical specialization, portrayed by a large and rapid expansion on back-and-forth operations in intermediate parts and components (henceforth, IPC) in the form of intra-industry trade. ASEAN has gained important competitiveness in fragmented structures and has re-oriented its trade flows from NAFTA and EU to Asian markets. All the six largest ASEAN members gained in immersion in vertical trade from the year 1997 to 2012, turning ASEAN into a region with the largest share of trade under vertical specialization equivalent to 55% (Esquivias Padilla, Sari, & Handoyo, 2017). However, ASEAN has a large dependency towards foreign IPC as inputs to their exports, particularly with East Asia being the largest supplier of IPC. ASEAN has turned towards Asia. By the year 2012, 78% of total IPC and 50% of total final good exported by ASEAN were to Asian countries. While the single production project region does not seem to be the engine of a more integrated ASEAN—or at least it is not changing the pattern of regional integration—it seems to be helping the ASEAN to a better integration into the Global Value Chain (henceforth GVC).

This study analyses the impact of the extension of the ASEAN single production base region to a wider scope of ASEAN Plus Six (China, S. Korea, Japan, India, Australia, and New Zeeland) not often explored previously under vertical trade. The issue of an increasingly dependent ASEAN has been raised (e.g. Haddad, 2007; Urata, 2008), however, this paper gives more recent data, includes more ASEAN countries, and it provides more detailed data on the sources of dependence as it splits exports into different components and it traces Value-added exports (rather than gross exports) from the origin to end. By doing that, this study offers links of the drastic development in regional trade with Vertical Specialization, particularly evaluating changes in patterns over the period of 15 years. This study looks into the following research questions: How does the pattern of Vertical Specialization change by including the six partners proposed by ASEAN Plus Six?, and How does the role of ASEAN within GVC change when the ASEAN is extended to Plus Six? Such questions aim to measure the trade under Vertical Specialization and the change in the role played by ASEAN when the region strengthens connects with booming Asian region, which is a strong driver of trade and growth. This study through production networks approach intents to reveal they dynamics of growth and the importance are played by these structures in the rapid expansion of trade in the ASEAN region.

2. Literature Review

This paper falls into Value-added (henceforth VA) measurement and Vertical Specialization. This paper uses the methodology of (Koopman, Powers, Wang, & Wei, 2010; Koopman, Wang, & Wei, 2012) in which they incorporate the linear combinations of earlier indicators on value-added exports and Vertical Specilization (henceforth VS) such as those developed by (Daudin, Schweisguth, & Rifflart, 2011; Hummels, Ishii, & Yi, 2001; Johnson & Noguera, 2012). Whereas the above experiential methodologies rightly broke down Value-added derived from direct and some indirect degrees, some neglected shares of value-added embedded in other countries' IPC that cross multiple borders (Wang, Wei, & Zhu, 2013). A particular role of this study is the

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aggregation of different value-added indicators, over a long period of time, analysing trade across and within main trading communities.

Empirical studies on vertical trade report a large expansion over the last decades. Los et al. (2015) referred to a global increase in foreign Value-added by nearly 20% from the year 1995 to 2011, claiming that global fragmentation is taking stronger importance over regionalization. Other studies as in Baldwin and Lopez-Gonzalez (2015) claimed that Asia, American and European blocs had created regional factories rather than expanding globally. Other studies claimed rather mix results for Asia (ADB, 2007; Athukorala & Nasir, 2012; Cheewatrakoolpong, Sabhasri, & Bunditwattanawong, 2013). Esquivias Padilla et al. (2017) noted a regional expansion in supply (Asian) and global expansion in demand, rebalancing towards Asia. This study aims to fill up the gap in literature by clarifying regionalization and globalization effects under the ASEAN Plus Six by employing Vertical Specialization and Value-added trade approach and tracing changes (gains and losses through time).

ASEAN Plus Six countries are probably experiencing the most dynamic changes in integration under production networks, both the intra-region and World. This paper offers the perspective of two regions in process of a more integrated trade regime, evaluation the gains under the perspective of regional targets, and unveiling the possible existence of spillovers and contagious effects towards the ASEAN by being more integrated with East Asia and India.

Versus other studies, this paper employs indicators on Vertical Specialization as a proxy to measure and evaluate the integration of regional communities in a period highly relevant as it covers important milestones towards the full implementation of the agreement. While literature on the region might try to explain trade expansion through CGE models (Urata, 2008), gravity models, and other approaches (ADB, 2007; Ando, 2008; Baldwin & Lopez-Gonzalez, 2015; Cheewatrakoolpong et al., 2013), the focus of the studies is seldom placed on measuring and evaluating the development of production networks under the ambitious ASEAN Plus Six agreement.

3. Research Methodology

This study employs Value-added trade scrutiny derived from Vertical Specialization through a global Input-Output stand. It measures Value-added trade for ASEAN Plus Six countries, and looks at two larger trading blocs NAFTA and EU as a reference. This method is an expansion of Koopman et al., (2010, 2012) with the additional element of integrating regions and finding changes on regional VA trade across 15 years, a special period of the implementation of the ASEAN Free Trade Area (AFTA). Including the Plus Six partners also give an important contribution to literature in the field, as the ASEAN Plus Six is seldom address under this structures.

The common outline of this research entails subset the country's gross exports into domestic Value-added exports, foreign Value-added, Value-added exports returning home, and some added double counted terms. From the nine main Value-added terms, additional indicators are measured: vertical specialization, GVC participation, GVC position, indirect specialization, among others. By breaking down export flows based on origin and destination, and by integrating data based on the ASEAN Plus Six region, it is possible to trace the complete value chain and to dash global effects rather than looking only at direct destinations as it is often found. This methodology completely broke down gross exports according to sources of VA formation and VA inclusion, which allow tracking connections in the Global Value Chain.

This study includes different indicators of vertical specialization developed by other authors. This paper employs the YNU-GIO Inter-Country Input-Output dataset developed by the CESSA, (Sato & Shrestha, 2014). This study is the first one employing the YNU-GIO table under this approach, offering the advantage of including more

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Asian countries (i.e. WIOD, AIO) and longer periods of time than most Input-Output datasets. It comprises 29 endogenous countries, 59 exogenous ones and 35 economic sectors by the years 1997, 2004, and 2012.

The overall gross exports are divided into nine provisions consisting in a main derived equation, an additional breakdown of Leontief input-output. First, data are set as an ICIO Matrix. It is presumed that each G-country generates goods in N distinguished tradable sectors. Goods can be consumed at home as final goods or employed as IPC. Goods can also be exported as final goods or IPC.

$$X_s = \sum_{r}^{G} (A_{Sr} X_r + Y_{sr}), r, s \ldots . . G \qquad [1]$$

X_s is the Nx1 gross output vector of country s, Y_{sr} is the NxN final demand vector and A_{sr} is the NxN IO coefficient matrix (Koopman et al. 2012). The G-country, N-sector production and trade system in Equation (1) is written as an Inter-Country Input-Output matrix notation:

$$\begin{bmatrix} X_{11} & X_{12} & \ldots & X_{1G} \\ X_{21} & X_{22} & \ldots & X_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ X_{G1} & X_{G2} & \ldots & X_{GG} \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} & \ldots & B_{1G} \\ B_{21} & B_{22} & \ldots & B_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ B_{G1} & B_{G2} & \ldots & B_{GG} \end{bmatrix} \begin{bmatrix} Y_{11} & Y_{12} & \ldots & Y_{1G} \\ Y_{21} & Y_{22} & \ldots & Y_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ Y_{G1} & Y_{G2} & \ldots & Y_{GG} \end{bmatrix} \qquad [2$$

B_{sr} denotes the total requirement matrix (Leontief inverse). Next, the VA share matrix by source is built. Vs correspond to the 1×N direct VA coefficient vector. Multiplying these direct VA shares with the matrix B (Leontief inverse) generates the G×GN Value-added share (VB). However, to get domestic Value-added in a country's gross output, an additional Value-added coefficient matrix is introduce ($\hat{V}_s$), with a GN-by-GN dimension with the direct VA coefficients along the diagonal and exports of VA in the off-diagonal columns. This GNxGN matrix is multiplied by BY to obtain $\hat{V}BY$ matrix.

$$BY = \begin{bmatrix} \hat{V}_1 & 0 & \ldots & 0 \\ 0 & \hat{V}_2 & \ldots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \ldots & \hat{V}_G \end{bmatrix} \begin{bmatrix} X_{11} & X_{12} & \ldots & X_{1G} \\ X_{21} & X_{22} & \ldots & X_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ X_{G1} & X_{G2} & \ldots & X_{GG} \end{bmatrix} = \begin{bmatrix} V_1 \sum_{r}^{G} B_{1r} Y_{r1} & V_1 \sum_{r}^{G} B_{1r} Y_{r2} & \ldots & V_1 \sum_{r}^{G} B_{1r} Y_{rG} \\ V_2 \sum_{r}^{G} B_{2r} Y_{r1} & V_2 \sum_{r}^{G} B_{2r} Y_{r2} & \ldots & V_2 \sum_{r}^{G} B_{2r} Y_{rG} \\ \vdots & \vdots & \ddots & \vdots \\ V_G \sum_{r}^{G} B_{Gr} Y_{r1} & V_G \sum_{r}^{G} B_{Gr} Y_{r2} & \ldots & V_G \sum_{r}^{G} B_{Gr} Y_{rG} \end{bmatrix} \qquad [3]$$

Next gross exports are decomposed. A country's total VA exports, denoted by $VT_{s*} = \sum_{r \neq s}^{G} VX_{sr} = V_s \sum_{r \neq s}^{G} \sum_{a=1}^{G} B_{sa} Y_{ar}$ are rewritten according to where and how the VA is absorbed.

$$VT_{s*} = V_s \sum_{r \neq s}^{G} B_{ss} Y_{sr} + V_s \sum_{r \neq s}^{G} B_{sr} Y_{rr} + V_s \sum_{r \neq s}^{G} \sum_{t \neq s,r}^{G} B_{sr} Y_{rt} \qquad [4]$$

Equation (4) is the VA export equation, including Value-added in a country's *s* final goods exports to *r*; 2nd Value-added in IPC exports; 3rd VA in re-exports to *t* countries. Gross exports from country s are defined:

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$$E_{s*} = \sum_{r \neq s}^{G} E_{sr} = \sum_{r \neq s}^{G} A_{sr} X_r + Y_{sr} \quad [5]$$

Equation (5) is further broken down according to where the IPC and final goods are taken in.

$$uE_{s^*} = V_s B_{SS} E_{s^*} + \sum_{r \neq s}^{G} V_r B_{rs} E_{s^*}$$

$$= VT_{s^*} + \left\{ V_s \sum_{r \neq s}^{G} B_{sr} Y_{rs} + V_s \sum_{r \neq s}^{G} B_{sr} A_{rs} X_s \right\} + \left\{ \sum_{t \neq s}^{G} \sum_{r \neq s}^{G} V_t B_{ts} Y_{sr} + \sum_{t \neq s}^{G} \sum_{r \neq s}^{G} V_t B_{ts} A_{sr} X_r \right\} \quad [6]$$

VT_{s*} in equation (6) specifies the Value-added exports in final goods, and four different flows of the country's VA exports. Based on each country's gross output identity, $X_s = (I - A_{ss})^{-1} Y_{ss} + (I - A_{ss})^{-1} E_{s*}$ and $X_r = (I - A_{rr})^{-1} Y_{rr} + (I - A_{rr})^{-1} E_{r*}$ and substituting into equation (6):

$$\begin{aligned} uE_{s*} = & \left\{ V_s \sum_{r \neq s}^{G} B_{ss} Y_{sr} + V_s \sum_{r \neq s}^{G} B_{sr} Y_{rr} + V_s \sum_{r \neq s}^{G} \sum_{t \neq s,r}^{G} B_{sr} Y_{rt} \right\} + \left\{ V_s \sum_{r \neq s}^{G} B_{sr} Y_{rs} + V_s \sum_{r \neq s}^{G} B_{sr} A_{rs} (I - A_{ss})^{-1} Y_{ss} \right\} \\ & + V_s \sum_{r \neq s}^{G} B_{sr} A_{rs} (I - A_{ss})^{-1} E_{s*} + \left\{ \sum_{t \neq s}^{G} \sum_{r \neq s}^{G} V_t B_{ts} Y_{sr} + \sum_{t \neq s}^{G} \sum_{r \neq s}^{G} V_t B_{ts} A_{sr} (I - A_{rr})^{-1} Y_{rr} \right\} \\ & + \sum_{t \neq s}^{G} V_t B_{ts} A_{sr} \sum_{r \neq s}^{G} (I - A_{rr})^{-1} E_{r*} \quad [7] \end{aligned}$$

Equation (7) contains nine special terms derived from the sources of formation and destination. The first three terms stand for the VA in exports; the fourth and fifth comprise VA firstly being exported but ultimately returning home. The seventh and eighth terms comprise foreign VA in the home's country exports. The sixth and ninth terms are two times counted terms.

From the nine main terms the following indicators are proposed (the number indicate the terms in equation 7): GDP in exports composed by adding 1 to 5. Domestic Value-added (DVA) is a country's exports equals sum of 1 to 6. Value-added exports (VT) sum 1 to 3. Foreign Value-added (FV or VS ratio) is in gross exports sum 7 to 9. Double counted home country's intermediate exports 6 and 9. Multiple back-and-forth trade sums from 3 through 9. One-way trade equals 1 + 2. Vertical Specialization (VS1 Share) Share measure measures the Domestic Value-added embedded in the exports of foreign countries. GVC position equals Share of VS ratio to VS1 share. Share of Vertical Trade equals VS ratio + VS1 share.

4. Results and Discussion

This study distinguishes trade flows from gross terms and Value-added terms. It also considers the gains in the expansion of the free trade agreement with the ASEAN to the six strategic partners (South Korea, China, India, New Zealand and Australia). ASEAN exports to six partners grew 328% from the year 1997 to 2012, which is larger than any other region. IPC reaches a 369% growth rate while growth in final goods with East Asia alone produced 277% (Table 1). In gross terms, 64% of ASEAN exports are absorbed within the ASEAN Plus 6. The total of 78% of the IPC and 50% of the final goods are exported within the ASEAN Plus 6. In Value-added export terms, East Asia takes up a third of ASEAN Value-added exports, which represents about 8% more than the year

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1997, while VA to NAFTA and EU shrank as a share of total ASEAN VA exports. The Plus Six strategic members experience the largest growth rates in both gross exports (total, parts and components and final goods) and Value-added terms. It also represents the region which ASEAN experience the largest changes, both in exports and imports of gross and Value-added terms. Gains with Plus Six are larger in almost all VA components than the Intra-ASEAN gains due to better integration.

ASEAN has a quite little contribution in the GVC as an exporter of VA embedded in final goods (30.5%) and is shifting into a strong position as a supplier of IPC equal to 50% of the total ASEAN VA trade (column 2 and 3 Table 2). ASEAN exports contain a high share of Foreign Value-Added (FVA) in exports (US$ 0.35 per each US$ 1.00 exported), largest share among all regions, showing dependency to foreign supplies, and high participation in vertical trade.
This research finds that ASEAN is highly integrated with the ASEAN Plus 6. As an example, it absorbs 65% of the total ASEAN VA exports; together, they absorb 75% of the total ASEAN VA exports of IPC, indicating a strong regional (Asian) orientation in production networks. Two-thirds of foreign VA employs in ASEAN exports originate from Asia. A total of 75% of ASEAN's re-exports and 95% of its back-and-forth trade remained within the ASEAN Six.

Table1. Gross Exports IPC, Final Goods and Total 1997 and 2012 ASEAN Plus Six

	IPCs		**Final Goods**		**Total**	
From / To	**ASEAN+6**	**Other**	**ASEAN+6**	**Other**	**ASEAN+6**	**Other**
1997	**Share from IPC's**		**Share from Final Goods**		**Share from Total Exports**	
PLUS SIX countries	56%	44%	30%	70%	41%	59%
ASEAN	65%	35%	39%	61%	50%	50%
2012	Share from IPC's		Share from Final Goods		Share from Total Exports	
PLUS SIX countries	68%	32%	30%	70%	46%	54%
ASEAN	78%	22%	50%	50%	64%	36%
TOTAL Growth 1997 - 2012						
PLUS SIX countries	416%	204%	380%	364%	401%	313%
ASEAN	369%	152%	277%	137%	328%	141%
Share from Global exports	**1997**	**2012**	**1997**	**2012**	**1997**	**2012**
Global Exports (US$ Billion)	2 577.43	8 240.75	3 908.44	1 0767.56	6 485.88	19 008.32
ASEAN Plus Six (US$ Billion)	620	2 567	836	3 462	1 456,93	6 029.30
ASEAN Plus Six Global Share	24%	31%	21%	32%	22%	32%

Notes: ASEAN Plus 6 (Indonesia, Singapore, Malaysia, Thailand, the Philippines, Vietnam, China, South Korea, Japan, Australia, India, New Zeeland)

This study finds that it is a vital to further integrate with plus Six as East Asian countries alone absorb more Value-added (35%) than Intra-ASEAN partners (20%), and the growth of trade with Plus Six partners is larger than Intra-ASEAN trade. Most of the growth in ASEAN exports from 1997 to 2012 was under fragmented structures which happened to be oriented towards Asia.

Table 2. Gross Exports Decomposition ASEAN, East Asia, NAFTA, and EU 1997 and 2012 (Share of Total Gross Exports)

	Region	Exports US$ Billion	Value-added exports (VT)			DV return Home (VS1*)			Foreign Value-added (FV)		
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1997	ASEAN	$449	37.5%	21.9%	5.6%	0.2%	0.1%	0.2%	19.8%	8.3%	4.3%
	EAST ASIA	$961	53.1%	28.5%	5.9%	0.4%	0.4%	0.1%	7.1%	3.5%	1.3%
2012	ASEAN	$1 504	30.5%	24.5%	7.1%	0.2%	0.1%	0.2%	18.9%	9.4%	5.7%
	EAST ASIA	$4 109	55.4%	21.7%	5.5%	0.5%	0.5%	0.1%	10.6%	4.1%	2.0%
	NAFTA	$3 130	50.6%	30.7%	6.0%	1.4%	1.2%	0.2%	5.3%	3.3%	1.2%

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	EU	$6 132	46.8%	18.2%	5.9%	0.4%	0.2%	0.2%	18.2%	5.8%	3.7%

Note: (1) Domestic Value-added (DV) in direct final goods, (2) DV in IPC exports absorbed by direct importer, (3) DV in IPC re-exported to third countries, (VS1) DV in IPC exports that return home, (4) DV in IPC that return via final goods, (5) DV in IPC that return via IPCs, (6) Double counted IPC exports, (VS or FV) Foreign Content, (7) FV in final goods exports, (8) FV in IPC goods exports, (9) Double counted IPC exports produced abroad.*

East Asia's regional value chains have expanded to neighboring countries, creating a strong regional supply chain but it remains globally oriented for final demand. By contrast, the ASEAN keeps a similar structure in domestic VA exports and shares in global trade under vertical trade. ASEAN also decreases its share with NAFTA and EU, and re-oriented exports to East Asia. It is highly probable that ASEAN lost foreign markets to East Asia.

The ASEAN Plus 6 region has substantially developed for the last 15 years. Today it accounts for almost one-third of total global trade, about becoming the largest free trade area in the World. It also changes its patterns of trade with almost all regions of the World, either by replacing foreign VA with domestic content, increasing its share of VA in other countries exports (indirect VA), increasing participation in all markets, or re-orienting its role within the value chain (largest producer of IPC). East Asia is now more oriented to final goods while ASEAN has become a strong supplier of IPC's. The dynamics of East Asia shifts the role of ASEAN countries in the GVC: Indonesia as a supplier of IPC, Thailand and Vietnam increase East Asian content in their exports. Total East Asian content in ASEAN exports account for 10% (3% higher than 1997). ASEAN Plus 6 structures highly matter for ASEAN.

Table 3. Vertical Share VS1, Total VS, VS Share, GVC participation, and GVC Position Regions

	VS1 (16)	TOTAL VS	VS Share FV (14)	VS1 Share (16)	TOTAL VS (GVC Participation)	GVC Position
	Gross Exports ($US million)		Share (%) Gross Exports			
1997						
East Asia	108 712	223 707	12%	11%	23%	-0.006
ASEAN	72 697	218 424	33%	17%	50%	-0.133
NAFTA	192 434	290 019	7%	15%	22%	0.065
EU	340 601	891 896	22%	14%	36%	-0.072
2004						
East Asia	230 558	505 150	16%	13%	29%	-0.022
ASEAN	120 256	366 694	38%	19%	57%	-0.153
2012						
East Asia	606 631	1 276 718	16%	15%	31%	-0.013
ASEAN	283 212	794 885	35%	20%	55%	-0.124
NAFTA	583 331	874 683	9%	19%	28%	0.082
EU	1 087 695	2 746 422	27%	18%	45%	-0.077

Notes: (VS) Value-added Foreign Content, (VS1) Domestic Value-added embedded in foreign exports, (Total VS) Vertical Specialization or GVC Participation, and (GVC) Global Value Chain Position

In 2012, ASEAN Plus Six accounted for 32% of global trade, up from 22% in 1997. IPC's increased from 24% of total IPC trade in 1997 to 31% in 2012, and final goods from 21% to 32%. At this speed of growth rate, soon ASEAN Plus Six might become the largest free trade area in the World.

The rapid growth of the Six strategic partners offers great possibilities to expand (both for local demand and to complement their exports) but also presents the challenges of increasing competition as the area is more aggressive than the Intra-ASEAN. While East Asia offers a noticeably larger market and also offers a channel of indirect exports to the World, it also places pressure on ASEAN as the dependency in the supply of intermediate inputs was previously noted by (Athukorala and Yamashita, 2006; Haddad, 2007; Urata, 2008; and Kimura and

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Obashi, 2016). This study offers more recent data, and brakes down exports into components of Value-added, identifiyng stages of dependency, both as a source of supply of intermediate goods as well as the destination of exports.

A more integrated ASEAN Plus Six might also intensify competition, and open the door of potential negative spillover effects upon slow down in East Asian exports. Additional findings: 1) Leadership under vertical trade in the region shifts from Japan to China (now three times larger than Japan). 2) Trade of ASEAN with emerging countries (India, China, ASEAN) grew faster than with advanced ones. 3) Asia is more diverse than NAFTA and EU in network creation (regional in production, global in final demand). 4) Asia is changing the gravitational center of Production Networks (40% of total vertical trade in 2012). ASEAN reports downstream orientation in the GVC (larger shares of IPC in their exports) together East Asia and EU. NAFTA remains as an upstream player (large exports of IPC). ASEAN slightly shifts in its position towards upstream, as the region experienced firm grow due to high global demand for commodities. All other blocks strengthen their roles in the GVC.

Table 4. Value-Added Exports Indicators ASEAN + Six 2012

	Value-added (VT) exports (11) US$ Billion		Share of Domestic Value-added (VT) in Gross Exports		Share of Foreign content (VS) on Gross exports		Destination of Value-added exports VT (%)		Share of Origin of Foreign content VS in exports (%)	
	Intra ASEAN SIX 6	Extra ASEAN SIX 6	Intra ASEAN SIX 6	Extra ASEAN SIX 6	Intra ASEAN SIX 6	Extra ASEAN SIX 6	Intra ASEAN SIX 6	Extra ASEAN SIX 6	Intra ASEAN SIX 6	Extra ASEAN SIX 6
East Asia	4 021	815	36%	46%	8%	9%	44%	56%	45%	55%
ASEAN	933	519	39%	23%	21%	14%	63%	37%	60%	40%
NAFTA	2 731	307	26%	61%	2%	7%	30%	70%	24%	76%
EU	4 347	1 903	12%	59%	4%	27%	17%	83%	14%	86%

East Asia appears as a more dynamic region than ASEAN as it grew 5.3 times in back-and-forth trade. East Asia shifted from high dependency from NAFTA, from 24% of intermediate goods in 1997 to only 19% in 2012, while increasing intra-East Asia Foreign Value-added from 20% to 23%. East Asia is the region with the largest domestic Value-added in final goods (55.4%), successfully substituting foreign Value-added with local content.

Even though ASEAN has expanded its trade with East Asia more than with any other region, some re-exports through East Asia appears rather small (2.5% of gross exports) to conclude that East Asia is a significant driver of re-exports for ASEAN. In fact, intra-ASEAN re-exports are larger than re-exports through East Asia channel (2.8%). However, it is true that re-exports of ASEAN through East Asia grew from 1.07% (share of ASEAN gross exports) in 1997 to 2.5% in 2012, while those of ASEAN fell from 2.97% to 2.8%. Interestingly, by integrating ASEAN Plus Six, a network of re-exports of almost 6% of total Value-added in intermediate goods is created.

The Plus Six countries are larger and more developed than ASEAN. In 1997 Plus Six accounted for 31% of global share in internal consumption of parts and components (IPC) while 27% in final goods. On the other hand, ASEAN accounted for only 4% of share in global consumption of IPC and 3% in final goods. By 2012 Plus Six accounted for 45% of IPC global consumption and 34% of final good, while ASEAN accounted for 4% and 3% respectively. ASEAN market lack size (market volume) and by instance, the region has to go extra-ASEAN to find additional growth in the exports. The expansion of vertical trade in ASEAN is then related to the dynamism (and size) of its partners rather than by a more integrated ASEAN. Plus Six regions have grown faster than ASEAN in global shares while ASEAN has only expanded maximum 1% share of either global exports, production and consumption share.

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While this study does not look at determinants of GVC participation, the findings might be in line with those structural factors found by (Kowalski, Gonzalez, Ragoussis, & Ugarte, 2015) with ASEAN probably benefiting from 1) geographic location with booming East Asia and India; 2) expanding GVC as ASEAN for further develop, improves trade-investment regimes, logistics, and infrastructure; 3) though not largely benefiting from market volume as it is slowly gains in size and links. The ASEAN appears highly integrated with neighboring Asian partners, more dependent in regional trade for parts and components, but still oriented to extra-ASEAN for final demand and key supplies of parts and components. Looking at particular components of Value-added trade rather than gross exports allows understanding while the ASEAN is exporting more; it is highly connected to regional – global value chains, playing important roles at particular segments in the GVC but remaining dependent on foreign players.

Conclusion

ASEAN is growing its trade flows in East Asia, keeping its Intra-ASEAN rates of vertical integration, and losing steam with EU and NAFTA. The largest changes in patterns of vertical trade for ASEAN arise as it increases participation by joining the GVC, rather than by creating new sources of trade, or diversifying efforts. The single production project of ASEAN region does not seem to be the engine of a more integrated ASEAN, or at least it is not changing the pattern of regional integration. The dynamics in ASEAN growth appear not so much because of the inner strength as a single region but as being a part of the dynamic Asian network, meaning a larger scope of integration might help the region to expand. East Asia and India are changing their pattern of trade towards larger shares of final goods and less IPC exports, opening opportunities for ASEAN to complement them by supplying IPC and re-locate IPC production.

ASEAN's large and fast growing share in vertical trade (41% of total growth trade, equivalent to 251% of growth in vertical trade) denotes competitiveness developed in these structures with some factors (production, service links, trade, competitiveness, location advantages) possibly supporting the expansion of fragmented structures.

Further integration with ASEAN Plus Six also represents a challenge for the ASEAN. 1) East Asia relies in low foreign VA 18% for their exports, 2) Re-exports from Plus Six are not as large though, 3) Plus Six members had more productive capability, technical innovation, and larger global networks than ASEAN, which might result in larger completion, 4) ASEAN comprises a negative trade balance with all trading associates when considering trade under Value-added, while overall positive under gross terms. The last point indicates that while ASEAN might export more in gross terms, over the time, the impact gets lower in Value-added.

References

ADB. (2007). Is Intra-Asian Trade Growth Driven by Independent Regional Demand. Asian Development Outlook 2007. Retrieved from https://www.adb.org/sites/default/files/publication/27709/ado2007.pdf

Ando, M. (2008). Economic Effects of an ASEAN + 6 Free Trade Agreement : A CGE Model Simulation Analysis. Asia Research Report 2007. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.493.4647&rep=rep1&type=pdf

Athukorala, P.-C., & Nasir, S. (2012). Global production sharing and south-south trade. Indian Growth and Development Review, 5(2), 173–202. https://doi.org/10.1108/17538251211268080

Athukorala, P.-C., & Yamashita, N. (2006). Production fragmentation and trade integration: East Asia in a global context. The North American Journal of Economics and Finance, 17(3), 233–256. https://doi.org/10.1016/j.najef.2006.07.002

Baldwin, R., & Lopez-Gonzalez, J. (2015). Supply-chain Trade: A Portrait of Global Patterns and Several Testable Hypotheses. The World Economy, 38(11), 1682–1721. https://doi.org/10.1111/twec.12189

Cheewatrakoolpong, K., Sabhasri, C., & Bunditwattanawong, N. (2013). Impact of the ASEAN Economic Community on ASEAN Production Networks. http://dx.doi.org/10.2139/ssrn.2222459

Daudin, G., Schweisguth, D., & Rifflart, C. (2011). Who produces for whom in the world economy? The Canadian Journal of Economics, 44(4), 1403–1437. https://doi.org/10.1111/j.1540-5982.2011.01679.x

Esquivias Padilla, M. A., Sari, D. W., & Handoyo, R. D. (2017). Formation of production networks in ASEAN: Measuring the real value-added and identifying the role of ASEAN countries in the world supply chains. Business and Economic Horizons, 13(2), 237–255. http://dx.doi.org/10.15208/beh.2017.18

Haddad, M. (2007). Trade Integration in East Asia: The Role of China and Production Networks (SSRN Scholarly Paper No. ID 969237). Retrieved from Social Science Research Network website: http://papers.ssrn.com/abstract=969237

Hummels, D., Ishii, J., & Yi, K.-M. (2001). The nature and growth of vertical specialization in world trade. Journal of International Economics, 54(1), 75–96. https://doi.org/10.1016/S0022-1996(00)00093-3

Johnson, R. C., & Noguera, G. (2012). Accounting for intermediates: Production sharing and trade in value added. Journal of International Economics, 86(2), 224–236. https://doi.org/10.1016/j.jinteco.2011.10.003

Kimura, F., & Obashi, A. (2011). Production networks in East Asia: What we know so far. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1957947

Koopman, R., Powers, W., Wang, Z., & Wei, S.-J. (2010). Give credit where credit is due: Tracing value added in global production chains. Retrieved from National Bureau of Economic Research website: https://doi.org/10.3386%2Fw16426

Koopman, R., Wang, Z., & Wei, S.-J. (2012). Tracing Value-Added and Double Counting in Gross Exports. American Economic Review, 104(2), 459–494. https://doi.org/10.1257/aer.104.2.459

Kowalski, P., Gonzalez, J. L., Ragoussis, A., & Ugarte, C. (2015). Participation of Developing Countries in Global Value Chains. Retrieved from http://www.oecd-ilibrary.org/trade/participation-of-developing-countries-in-global-value-chains_5js33lfw0xxn-en

Los, B., Timmer, M. P., & J de Vries, G. J. (2015). How Global Are Global Value Chains? A New Approach to Measure International Fragmentation. Journal of Regional Science, 55(1), 66–92. https://doi.org/10.1111/jors.12121

Sato, K., & Shrestha, N. (2014). Global and Regional Shock Transmission -An Asian Perspective-. Center for Economic and Social Studies in Asia (CESSA) WP, 04. Retrieved from http://www.econ.ynu.ac.jp/cessa/publication/pdf/CESSA%20WP%202014-04.pdf

Urata, S. (2008). An ASEAN+ 6 economic partnership: Significance and tasks. Retrieved from Asia Research Report 2007. Tokyo: Japan Center for Economic Research website: https://www.jcer.or.jp/eng/pdf/asia07.pdf

Wang, Z., Wei, S.-J., & Zhu, K. (2013). Quantifying International Production Sharing at the Bilateral and Sector Levels (Working Paper No. 19677). Retrieved from National Bureau of Economic Research website: https://doi.org/10.3386%2Fw19677

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IMPROVING THE EFFICIENCY OF THE NEGOTIATION PROCESS IN THE SOCIAL PARTNERSHIP SYSTEM

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Abstract. The article deals with the issues of increasing the efficiency of the negotiation process in the system of social partnership by optimizing a single negotiating company at the local level of social partnership. The developed methodology relies on a system of methods, the main of which are an online survey, content analysis and a focus group using the Likert method. The article for the first time summarized the experience on the implementation of a unified transnational campaign in the subsections of the Russian Federation (RF), evaluated the existing mechanisms used in social protection interests of workers. The analysis of the subjective and objective factors allowed the authors to reveal that the increase in the efficiency of the unified translational complex is impeded the desire for independence and independence of a number of trade union leaders. In the negative sector was the implementation of agreements (regional and sectoral). It requires the development of awareness of trade union functionaries. In the interests of increasing the efficiency of the negotiation process, it was proposed to improve the information system for providing trade union leaders; social protection issues should be addressed at their own levels. The main advantage of the article is that it points to the substantial dependence of the negotiation process on the subjective factor - trade union leaders. It is important to encourage them to conduct comprehensive work in the framework of the implementation of the basic principles of the negotiation campaign, focusing on the increase in wages, the subsistence minimum and the need to strengthen control, both from trade unions and from government bodies. The development of trade union leaders should focus on gaining knowledge and practical experience in negotiating, studying the regulatory framework. At the same time, they need to learn how to enlist the support of the team from the higher authorities. The harmonious development of all elements of the negotiation process will serve as a guarantee of increasing the efficiency and effectiveness of social partnership.

Keywords: efficiency, negotiations, trade union, leaders, social sphere, social partnership, social dialogue

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1. Introduction

In the context of the global economic crisis, business faces the problem of increasing competitiveness. Its resolution depends on many factors, the most important of which is company employees. Owners and managers of organizations need to find the keys to improving staff efficiency, loyalty, and commitment to corporate values (Buley at al., 2016). In this system, the state also has an obligation to take care of citizens, provide them with

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suitable work, create favorable working conditions and livelihoods. The socio-economic situation makes it difficult for the government and business to fulfill their obligations (Buley, Bondaletov at al., 2016; Androniceanu, 2019a). The workers themselves are often on the verge of survival and do not want to put up with a demeaning situation, disregard for their problems.

The struggle for their rights by workers is multifaceted. One of the issues is the fight against unfair treatment of employees by management in the system of motivation and stimulation of labor activity (Belle & Cantarelli, 2015; Liu & Perry, 2016; Vinichenko et al., 2018; Lorincová et al., 2019; Ciobanu et al., 2019), creating favorable, safe working conditions (Baxter et. Al, 2016; Rogach et al., 2016; Vinichenko et al., 2016; Bernardi, 2019), career advancement (Kataeva et al., 2015; Mysnik & Marchelya, 2014; Demeneva, 2007; Chulanova & Korosteleva, 2017), gender discrimination (Blossfeld & Huinink, 1991), social ethnic conflicts (Oseev et al., 2018; Vasile & Androniceanu, 2018).

A special place in the protection of their rights is occupied by young employees, the attitude towards which does not always correspond to the declared values (Demchenko et al., 2018; Vinichenko et al., 2017; Androniceanu, 2019b).

Practice shows that protests of workers only become effective when they are united by a center of resistance. They often become trade unions. It should be realized that the antagonistic struggle usually does not lead to the desired result. We need to compromise. The solution to a complex tangle of problems lies in the plane of social partnership (Frolova et al., 2016). All parties to a social partnership should strive to jointly address emerging issues through civilized negotiations.

One of the technologies for effective interaction within the framework of social partnership is the Unified Negotiating Company (hereinafter referred to as UNC). It is based on the observance of three basic ideas: uniform actions, uniform terms, uniform requirements. Their observance allows the primary trade union organizations to most effectively realize the potential of solidarity, take advantage of legal, consulting support of territorial and sectoral trade unions. It is important to gain trust from all parties involved in the negotiation process (Rogach, Frolova & Ryabova, 2018).

The developed approaches make it possible to streamline the negotiation process in Russia, to consolidate the efforts of trade unions to achieve greater effect in the negotiation process. At the same time, the most important conditions for the formation of a truly partnership are goodwill, free expression of one's own opinion and the practice of collective decision-making (Rogach, et al., 2018). Employees covered by traditional forms of labor relations, as noted in the studies, are more protected in the labor market (Precarious Employment in Europe, 2016). Data from the International Labor Organization show that traditional labor relations cover no more than one-quarter of workers (World Employment and Social Outlook, 2015), which adversely affects daily and work life (Rodgers, 1989), the formalization of relationships between people (Mühlberger, 2009; Borisov et al., 2018). Many researchers describe negative manifestations of precarious work (Fudge, 2011), which can affect any employees (Sciarra, 2004; Schmidt, 2002).

An important aspect of improving the effectiveness of the negotiation process in the system of social partnership is the level of education, preparedness, personal, leadership qualities of the trade union leader. The most important condition for the success of a trade union leader is its continuous development (Kirillov et al., 2017; Bondaletova et al., 2018), the use of modern self-improvement technologies and the development of leadership qualities (Bronkhorst et al., 2015).

Thus, an analysis of the available literature has shown that certain aspects of this problem have been disclosed, but there is no generalizing work. The high need to improve the efficiency of the negotiation process in the

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system of social partnership at the local level and the lack of ready-made recommendations for its optimization has caused the need for this study.

2. Methodology

The purpose of the study is to increase the efficiency of the negotiation process in the system of social partnership by improving the single negotiation campaign at the local level of social partnership - the level of the primary trade union organization.

The main tasks are based on the analysis of trade union reporting documents, the survey of trade union leaders and professional workers:

1. To summarize the experience of maintaining a single negotiation campaign in the constituent entities of the Russian Federation.

2. Assess to what extent the existing UNC mechanisms are actually applied in the social protection of the interests of the workers.

3. Analyze the subjective and objective factors hindering the effective conduct of the UNC.

4. Assess the degree of implementation of the principles of a single negotiation campaign at the level of the primary trade union organization.

The study was conducted in two stages: the first - December 2015 - December 2017, by employees of the Department of Sociology of the Department of Public Administration of the Moscow State University named after M.V. Lomonosov; the second - January 2018 - January 2019 - focus group of experts.

Hypothesis of the study - the success of a single negotiation campaign essentially depends on the local implementation of concrete actions by the parties to the social partnership for the social protection of the interests of the workers. At the same time, the creation of a more socially and effectively managed system of social protection is promoted by the formation of a social mechanism that protects equally the interests of social partners, which is possible through the negotiation process at various levels of social partnership.

The study used directional quota sampling using a comprehensive method of selecting respondents. As a result, 540 people took part in the study. Quotas were set by sex, age, status of professional workers. The respondents included: chairmen of trade union committees of enterprises, their deputies, trade union activists, as well as heads of territorial organizations of united trade unions and employees of the Central Committee of the trade union. The choice of these target groups was dictated by the need for a more complete analysis of the implementation of the EPC mechanisms. The criterion for selection of respondents was knowledge of the object of study, participation in the negotiation process.

The geographical coverage of the study extended to 19 Russian cities: Moscow, Ivanovo, Arkhangelsk, Izhevsk, Ufa, Tula, Chelyabinsk, Perm, St. Petersburg, Kirov, Kemerovo, Reutov, Nizhny Novgorod, Tyumen, Orel, Samara, Orenburg, Petrozavodsk, Saratov.

The main research methods were the questionnaire, the analysis of trade union reporting documents, the focus group. In determining the volume of the sample, the principles of design of the average sample were used, as well as expert analysis. The method of active continuous monitoring on the basis of trade union organizations in various constituent entities of the Russian Federation was used to collect and process information. The collection

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of primary information was carried out by the method of standardized questionnaires at the place of work and study of the respondents. The questionnaire survey was conducted anonymously by the method of self-filling the questionnaire. The choice of this method was dictated by the minimum influence of the interviewer on the respondents and the necessary control over the formation of the group of respondents.

Empirical data were processed using Excel and IBM SPSS Statistics 22, followed by a meaningful analysis. The results of the study are presented in the form of tables and figures, which contain the results of the analysis and statistical processing of the data obtained. At the final stage of the study, the focus group, using a comparative analysis using the Likert method, compared the data obtained with the actual state of affairs on the research problem at the beginning of 2019.

The focus group consisted of 10 experts from among domestic and foreign scientists, faculty members, and representatives of business structures. The focus of the group was the equipment that allowed the experts to exchange views with colleagues who were far away from each other and receive the necessary data from the Internet.

3. Results

In the course of a sociological study, it was possible to establish that a collective agreement is in a certain interaction with industry and regional agreements (Table 1).

Table 1. The relationship of the collective agreement with industry and regional agreements, %

Estimated Items	Industry agreement				Regional agreement			
	January-March	May-June	August-September	2016	January-March	May-June	August-September	2016
Collective agreement: Fully repeat content	3,5	4,4	2,7	3,3	1,5	3,9	0,6	0,5
Repeats some clauses	28,4	27,7	38,9	31,2	**33,6**	**24,9**	**28,2**	27,4
Complements and specifies its content.	**47,5**	**41,3**	**45,4**	**48,8**	21,9	20,0	25,4	**31,7**
Imposes restrictions on the agreement.	1,4	2,9	2,7	1,7	1,5	0,5	1,7	1,5
Not affiliated	5,7	6,3	4,3	3,6	15,3	9,8	22,7	16,1
Difficult to answer	13,5	17,5	5,9	11,4	26,3	41,0	21,5	22,9

Source: Compiled by authors

During the study period, the collective agreement basically supplemented and concretized the content of sectoral and regional agreements (48.8% and 31.7%, respectively), and also repeated some of their provisions (31.2% and 27.4%, respectively).

The degree of awareness was determined using a survey (Figure 1). As a result, it was established that the awareness of trade union leaders about the UNC technology is generally high: “informed” - 27.9% and “more likely informed” - 22.6%. At the same time, it was difficult to answer 4.8%.

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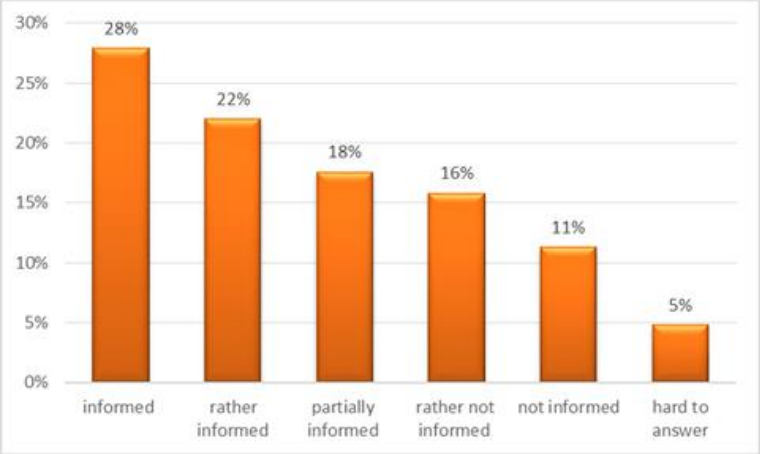

Fig.1. Awareness of trade union personnel on the EPC technology

Source: Compiled by authors

The nature of the influence of the main factors on the successful actions of the trade union leader during the negotiation process was revealed as a result of the respondents answering the question: "Indicate what, in your opinion, the trade union worker lacks to a greater extent for a single negotiation campaign?" (Table 2).

Table 2. The structure of the factors that determine the success of the trade union leader at the negotiations, %

№	Estimated Items	January-March	a plase	May-June	a place	August-September	a place	2017 г.	a place
1.	Practical experience	**19,1%**	**1**	**24,2%**	**1**	**18,6%**	**1**	**20,4%**	**1**
2.	Skills	14,9%	2	10,7%	5	11,4%	5	11,4%	6
3.	Regulatory framework	14,3%	3	13,2%	3	18,0%	2	17,7%	2
4.	Team support	14,0%	4	14,5%	2	17,6%	3	14,2%	4
5.	Knowledge	12,8%	5	12,3%	4	15,3%	4	17,0%	3
6.	Support from higher authorities	12,2%	6	10,7%	6	9,5%	6	12,5%	5
7.	Personal qualities and properties	5,4%	7	8,5%	7	6,4%	7	5,7%	7
8.	Difficult to answer	3,9%	8	4,0%	8	1,7%	8	-	-
9.	General culture	2,7%	9	0,9%	9	1,5%	9	1,1%	8
10.	Other	0,6%	10	0,9%	10	0,0%	10	0,1%	-

Source: Compiled by authors

An analysis of the data in Table 2 showed that among the most important factors that exceeded 10% of the bar and significantly affecting the preparation and conduct of negotiations by the trade union leader in the social partnership system are: practical experience (20.4%), regulatory framework (17.7 %), knowledge (17%), support for the team (14.2%), support from higher authorities (12.5), skills and abilities (11.4%).

The focus group discussion brought the results of a sociological survey, content analysis, discussed the degree of development of the principles of a single negotiation campaign by trade union leaders. During the discussion of the results of the survey by experts, on the basis of a comparative analysis with the current state of affairs in 2019, opinions were expressed on the nature of changes in the conduct of the negotiation process by trade union leaders in the system of social partnership. There were no significant changes in the collective bargaining system — a branch agreement — a regional agreement did not occur. The collective agreement also basically complements

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and specifies the content of sectoral and regional agreements. The awareness of trade union leaders increased slightly (31%), with a simultaneous increase in the number of those who were not fully informed (19%) and those who found it difficult to answer (8%). Practical experience (23%), knowledge of the regulatory framework (19%) and professional knowledge (17%) remained among the main factors that significantly influenced the course of the negotiating company.

4. Discussion

The ratio and interrelation of different levels of the negotiation process. A single negotiation campaign is built on an integrated system of links between different levels and elements of social partnership. At the same time, labor relations are traditionally viewed through the prism of a systems approach. This goes back to the works of Dunlop J.T. (1958), Moerel H. (1994) and Salamon M.W. (1987).

However, given the influence of the state on the formation of the Russian model of social partnership, as well as the existing international specifics of the labor market - precarious employment (Cranford, Vosko & Zukewich, 2003), incomplete, seasonal (Policies and Regulations to Combat Precarious Employment, 2011), social and labor relations local, regional (state) level (Duval & Furceri, 2018), trace the influence and interconnection of different levels of social partnership.

Industry Agreements. Distribution of answers according to the position “Industry Agreement” shows that about half of the respondents chose the option “Complements and specifies its content”. Slightly fewer respondents believe that the collective agreement repeats some provisions of the industry agreement. It is interesting to note that those who found it difficult to assess the interrelationship of the collective agreement with sectoral agreements turned out to be 11% less than under regional agreements. The structural reorganization of a number of industries and the reorganization of production under the influence of digital technologies lead to the disappearance of traditional management schemes, diversification of management decisions, expanding administrative and production boundaries of industries and enterprises (Veretekhina et al., 2018). In particular, in the countries of the European Union, according to the European Commission for March 2017, there are more than 30 projects on digitizing industry (Coordination of European, national & regional initiatives, 2017).

All this imposes serious typos on the existing system of partnerships. Expansion of partnership forms of trade union participation in sectoral management requires strengthening the federal level of social partnership, streamlining the system of responsibility and sanctions. At the same time, we must not forget that the subject of agreement of the parties at the sectoral level should be as wide a range of issues as possible than those fixed by the relevant legislative norms. Only in this case will industry-specific agreements acquire the status of self-sufficient legal acts.

Regional agreements. Compared to sectoral agreements, regional agreements cover the problems of social sphere regulation at the level of a constituent entity of the Russian Federation much more, taking into account the emerging regional specifics. Distribution of answers shows that, in the opinion of approximately every third respondent, this legal act “Complements and specifies the content of the collective agreement”. In general, there is an increase in the number of respondents who choose this answer. Alarmingly, a rather large percentage of respondents (16.1%), who indicated that the collective agreement "is not related to a regional agreement". It is interesting to note that a rather large percentage of respondents (33%) representing this group, in assessing the degree of interaction with higher trade union organizations, indicated the position “Situational Contacts”. 24% of their number indicated that they have no contacts “Permanent contacts” - 18%.

As can be seen from the distribution presented throughout the study period, there is a steady trend towards an insufficiently high degree of implementation of agreements at various levels. In the general structure of the

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answers according to the number of agreements mentioned, the "not implemented" group prevails (rating - 3 points), this includes: regional agreement, branch agreement, territorial agreement.

According to the "Collective Agreement" position, the answers were distributed as follows. Among those who took part in the survey, 97% of respondents answered unequivocally yes that they had a collective agreement.

The majority of respondents (67.5%) believe that this legal act is being implemented. 1.9% found it difficult to answer the question. Obviously, in the light of the problem being investigated, the implementation of collective agreements is largely determined by the presence of specific mechanisms for the local regulation of social and labor relations. These mechanisms are much more dynamic than centralized regulation. They are promptly tested and applied in the same place where they are used and are the most reliable and real collective means of protection by workers of their rights. Sometimes they carry out anticipatory regulation. This is not the case with higher level agreements.

The practice of implementing agreements (regional and sectoral) shows that the trade union side here faces serious difficulties. Exactly with the theoretical provisions of A. Kalleberg (2014), the obligations to reduce wage arrears and economic growth remain unfulfilled.

Considering the place of a regional agreement in the hierarchy of normative acts, its legal nature can be noted that in a number of agreements the problem of their implementation and the responsibility of the parties are not fully resolved. R. Hyman notes the dependence of the collective representation of workers on sectors and professions (Hyman, 1995).

It is also impossible to exclude the reasons caused by the imperfection of the regulatory framework governing the negotiation process. The agreement, in fact, loses its normative component, which makes them the most vulnerable legal acts.

In general, the collective agreement basically supplemented and concretized the content of the sectoral and regional agreements (48.8% and 31.7%, respectively), and also repeated some of their provisions (31.2% and 27.4%, respectively), which positively affected on the organization and conduct of the negotiation process.

Awareness of trade union personnel on UNC technology. Successful holding of the negotiation process is largely predetermined by information work at various levels of social partnership. The extent to which trade union leaders are informed about the main legal acts depends on their position in the negotiations, their ability to defend the interests of workers.

It is obvious that the knowledge of professional leaders about the main legal documents predetermines their thoroughness in work, reduces the risk of making wrong management decisions. The greater the degree of awareness of the trade union leader, the greater is his ability to coordinate his actions and chances for success in the negotiation process.

In the course of the study, it was established that the number of people informed about the UNC technology remains at about the same level. At the same time, the share of those who are not informed about UNC technology is decreasing. The study showed that representatives of large metropolitan cities more often than the average in the sample are informed about the UNC mechanisms. Representatives of regional and district centers, as well as cities with a population of less than 300 thousand people turn out to be the least informed than the average for the sample. A significant correlation is observed between the knowledge of the trade union leader and his status as a professional worker, as well as his position. With an increase in the length of service of trade union work, the number of those who are informed about the UNC mechanisms increases. However, among the

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"uninformed" there is a reverse trend. With the increase in length of service, the number of those respondents who unequivocally answer “No” increases. Obviously, the age of the respondents, their conservatism in acquiring new information, have a great influence. Thus, the respondents of the older age group (from 50 years and above), more often indicated that they do not have information on the UNC mechanisms.

The structure of the factors determining the success of the trade union leader in the negotiations. An analysis of a group of factors that significantly influence the preparation and conduct of negotiations by the trade union leader in the system of social partnership showed that they were almost proportionally distributed between the subjective and objective character with a shift in focus on the objective ones. Despite this, it was the subjective factor “practical experience” (20.4%) that was put in the first place. Also, the subjective factor “knowledge” ranked third (17%). This suggests the need for continuous development of trade union leaders, the passage of advanced training courses, the use of various, including distance learning, online and offline training (Moore & Pearson, 2017.). The most important factor was the support of the team (14.2%). Undoubtedly, an active, cohesive team can provide the trade union leader with real help and support in defending their rights. An additional argument in achieving the desired results during the negotiation process will be the support of higher authorities (12.5%).

In the course of the focus group's work, the extent to which trade union leaders adopted the principles of a single negotiation campaign to protect the interests of workers was discussed and emphasis was placed on the need to constantly bring the UNC system in line with the new Russian social and economic realities. To this end, obstacles to the conduct of the negotiation process were identified, and the main ways were formulated that contribute to the development of the system of protection of the organization’s employees (the region).

There were no significant differences in the answers of respondents in the sphere of professional activity by experts. Solving issues related to the regulation of wages, of course, prevails. After all, workers and employers have different bargaining power; in the search and matching model (Diamond, 1982), wages are determined during the bargaining process between the parties to the negotiation process. Among the priorities were the increase in the subsistence minimum, the increase in the average salary and the need to strengthen control, both from the trade unions and from the state bodies. It was revealed that in the general mass of the respondents the point of view prevails that social protection issues should be solved, first of all, independently - each at his own level.

In general, a certain imbalance developed in the studied subsamples. The reason for this imbalance is largely predetermined by the peculiarities of the negotiation process in the sectoral and territorial context. Not the last place in the influence on the distribution of answers has the execution of laws regulating the socio-economic situation of workers.

The overall assessment of the weaknesses in the negotiation process makes it possible to identify the main areas of development of the UNC principles in protecting the interests of workers: social responsibility of employers and the state (rising unemployment leads to increased state budget expenditures) (Dudin, Lyasnikov & Horikov, 2013; Androniceanu et al., 2019), on the labor market, the heterogeneity of agents causes friction leading to the simultaneous coexistence of vacancies and unemployment (Romer, 2006); stabilization and expansion of the protective functions of trade unions; improved regulatory framework; informational support of the negotiation process.

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Conclusions

Improving the efficiency of the negotiation process in the system of social partnership is the main direction of the realization of the legitimate rights of workers to uphold their interests. In the course of the study, the hypothesis was confirmed: the success of a unified transient campaign is completely dependent on the local implementation of concrete actions by the parties to social partnership on social protection of the interests of workers. The most important condition is the creation of a harmonious system that takes into account the interests of all parties to the negotiation process at various levels of social partnership.

UNC implementation today remains one of the main strategic directions of the development of the social partnership system. In the course of the study, it was found that the demand for UNC in a regional context is still limited. Due to the fact that the interests of many trade union leaders on the ground are not yet connected with the organization of comprehensive work within the framework of the implementation of the basic principles of the negotiation campaign. The deterrent factors here are, of course, the desire for independence and independence of a number of trade union leaders.

Among the characteristics of the work of trade union leaders in mastering the principles of the UNC in protecting the interests of workers, a special place belongs to the level of information support of the union work in the field, as well as the degree of professionalism of trade union personnel. Among the main indicators that determine the level and quality of information work in the field, the degree of awareness of the chairmen of trade union committees on the implementation of agreements at various levels was considered.

It is important to note that there is a significant discrepancy between the degree of awareness of respondents about the content of the agreement and its implementation. Weak awareness in the Russian trade unions reduces the effectiveness of the implementation of a single negotiating company, which in turn negatively affects the system of the formation of social partnership.

The practice of implementing agreements (regional and sectoral) shows that the trade union side here is faced with unfulfilled commitments to reduce wage arrears and economic growth. The problem of their implementation and the responsibility of the parties is directly dependent on the collective representation of workers from sectors and professions. Imperfection of the regulatory framework governing the negotiation process has a negative effect on the effectiveness of social partnership. Agreements, in essence, lose their regulatory component, making them the most vulnerable legal acts.

To reach the efficiency increasing in the negotiation process in the social partnership system, the following ways have been proposed:
1. To improve the information system for providing trade union leaders.

2. Issues of social protection should be addressed, first of all, independently - each at his own level.

3. To stimulate trade union leaders to conduct integrated work within the framework of the implementation of the basic principles of the negotiation campaign, focusing on the increase in wages, the subsistence minimum and the need to strengthen control, both from the trade unions and from government bodies.

4. The development of trade union leaders to focus on gaining knowledge and practical experience in negotiating, the study of the regulatory framework. At the same time, they need to learn how to enlist the support of the team from the higher authorities.

These measures will improve the efficiency of the negotiation process in the system of social partnership.

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References

Androniceanu, A.2019a. The social sustainability of smart cities: urban technological innovation, big data management, and the cognitive internet of things, *Geopolitics, History, and International Relations* 11(1): 110–115. https://doi.org/10.22381/GHIR11120197

Androniceanu, A., 2019b**.** A managerial approach to Romania's security strategy with NATO, *Journal of Security and Sustainability Issues*, 8(3): 423-433. http://doi.org/10.9770/jssi.2019.8.3(11)

Androniceanu A., Gherghina, R., Ciobănașu, M. 2019. The interdependence between fiscal public policies and tax evasion, *Administratie si Management Public*, (32), 32-41. https://doi.org/10.24818/amp/2019.32-03

Baxter, R.J.; Holderness, D.K.; Wood, D.A. 2016. Applying basic gamification techniques to it compliance training: evidence from the lab and field, *Journal of information systems*, 30(3): 119-133. https://doi.org/10.2308/isys-51341

Belle, N.; Cantarelli, P. 2015. Monetary Incentives, Motivation, and Job Effort in the Public Sector: An Experimental Study With Italian Government Executives, *Review of Public Personnel Administration*, 35(2): 99-123. https://doi.org/10.1177/0734371X13520460

Bernardi, A. 2019. The capability approach and organizational climate as tools to study occupational health and safety, *Insights into Regional Development*, 1(2): 155-169. https://doi.org/10.9770/ird.2019.1.2(6)

Blossfeld, H.P.; Huinink, J. 1991. Human Capital Investments or Norms of Role Transition? How Women's Schooling and Career Affect the Process of Family Formation, *American Journal of Sociology*, 97(1).

Bondaletova, N.F.; Kirillov, N.P.; Maslikov, V.A.; Nazarenko, S.V. 2018. Modern innovations in the system of Russian education as a factor of its effectiveness, *Espacios*, 39(49): 23.

Borisov, A.; Narozhnaia, D.; Tarando, E.; Vorontsov, A.; Pruel, N.; Nikiforova, O. 2018. Destructive motivation of personnel: a case study of Russian commertcial companies, *Entrepreneurship and Sustainability Issues*, 6(1): 253-267. http://doi.org/10.9770/jesi.2018.6.1(16)

Bronkhorst, B.; Steijn, B.; Vermeeren, B. 2015. Transformational Leadership, Goal Setting, and Work Motivation: The Case of a Dutch Municipality, *Review of Public Personnel Administration*, 35(2): 124-145.

Buley, N.V.; Bondaletov, V.V.; Makushkin, S.A.; Bondaletova, N.F.; Kozyrev, M.S. 2016. Public administration and municipal governance and its significance for a modern democratic society, International Journal of Economics and Financial Issues, 6(8S): 220-224.

Buley, N.V.; Demchenko, T.S.; Makushkin, S.A.; Vinichenko, M.V.; Melnichuk, A.V. 2016. Human resource management in the context of the global economic crisis, *International Journal of Economics and Financial Issues*, 6(8S): 160-165.

Chulanova, O.L.; Korosteleva, D.A. 2017. Methodical aspects of updating of "management of talents" technology in work with a personnel pool of the organizations, *Human resource management and intellectual resources in Russia*, 4(6): 15.

Ciobanu, A, Androniceanu A., Lazaroiu, G. 2019. An integrated psycho-sociological perspective on public employees' motivation and performance. *Frontiers in Psychology*, 10:36. https://doi.org/10.3389/fpsyg.2019.00036

Coordination of European, national & regional initiatives. 2017. Retrieved from: https://ec.europa.eu/digital-single-market/en/coordination-european-national-regional-initiatives.

Cranford, C.J.; Vosko, L.F.; Zukewich, N. 2003. Precarious Employment in the Canadian Labor Market: A Statistical Portrait, *Just Labour*, 3: 9.

Demchenko, T.S.; Karácsony, P.; Vinichenko, M.V.; Demchenko, M.V.; Melnichuk, A.V. 2018. Youth involvement in social control of the implementation of the youth personnel policy in the company management system, *Espacios*, 38(21): 8.

Demeneva, N.A. 2007. The European Community in combating discrimination on the basis of sex, *Bulletin of the State University of Communications and Information Technologie*s, 18: 111-117.

Diamond, P.A. 1982. Wage Determination and Efficiency in Search Equilibrium, *Review of Economic Studies*, 49: 217–227.

Dudin, M.N.; Lyasnikov, N.V.; Horikov, Yu.V. 2013. Brain factor and its stating role in enterprises' competitive recovery, *European Researcher*, 38(1–1): 15–19.

Dunlop, J.T. 1958. *Industrial Relations Systems*. New York: Henry Holt and Winston: 416.

Duval, R.; Furceri, D. 2018. The Effects of Labor and Product Market Reforms: The Role of Macroeconomic Conditions and Policies, *IMF Economic Review*, 66(1): 31-69.

Frolova, E.V.; Medvedeva, N.V.; Kabanova, E.E.; Kurbakova, S.N.; Vinichenko, M.V. 2016. Social Partnership in Russia: Prerequisites, Problems and Trends, *Journal of Advanced Research in Law and Economics*, 2(16): 221 – 228. https://doi.org/10.14505/jarle.v7.2(16).05 Retrieved from: http://www.asers.eu/journals/jarle/jarle-issues

Fudge, J. 2011. *The Precarious Migrant Status and Precarious Employment: The Paradox of International Rights for Migrant Workers*, Metropolis British Columbia: Centre of Excellence for Research on Immigration and Diversity Working Paper, 11-15: 12.

Hyman, R. 1995. Industrial Relations in Europe: Theory and Practice, *European Journal of Industrial Relations*, 1(1): 17-46.

Kalleberg, A.L. 2014. *Measuring Precarious Work*, A Working Paper of the EINet Measurement Group. Retrieved from: https://cpb-us-w2.wpmucdn.com/voices.uchicago.edu/dist/5/1068/files/2018/05/einet_papers_kalleberg-1owgfyz.pdf

Kataeva, V.I.; Kaurova, O.V.; Koludarova, S.V.; Sulyagina, J.O.; Fomicheva, T.V.; Kryuko, E.M. 2015. Barriers of inequality in social institutions of Russia, *Biosciences Biotechnology Research Asia*, 12(3): 2813–2820.

Kirillov, A.V.; Ushakov, D.S.; Vinichenko, M.V.; Makuchkin, S.A.; Melnichuk, A.V. 2017. Career Opportunities for the Management's Personnel Reserve, *Eurasian Journal of Analytical Chemistry*, 12(5b): 723-733. https://doi.org/10.12973/ejac.2017.00205a

Liu, B.; Perry, J.L. 2016. The Psychological Mechanisms of Public Service Motivation: A Two-Wave Examination, *Review of Public Personnel Administration*, 36(1): 4-30.

Lorincová, S.; Hitka, M.; Bajzíková, Ľ.; Weberová, D. 2019. Are the motivational preferences of employees working in small enterprises in Slovakia changing in time, *Entrepreneurship and Sustainability Issues*, 6(4): 1618-1635. https://doi.org/10.9770/jesi.2019.6.4(5)

Moerel, H. 1994. *The Study of Labour Relations*. Labour Relations in Transition, Nijmegen: Institute for Applied Social Sciences: 1-7.

Moore, K.A.; Pearson, B.J. 2017. Soft skills in an online class, *Horttechnology*, 27(5): 583-585.

Mühlberger, U. 2009. *The Social Effects of Precarious Work*, Research Report, Universität Wien. Retrieved from: https://static1.squarespace.com/static/559921a3e4b02c1d7480f8f4/t/5862fb6bff7c501ec52c6162/1482881901267/Mhlberger.pdf

Mysnik, V.G.; Marchelya, N.V. 2014. Discrimination of hired workers in the Russian labour market, *International scientific research journal*, 4(23), 3: 60-61.

Oseev, A.A.; Dudueva, F.A.; Karácsony, P.; Vinichenko, M.V.; Makushkin, S.A. 2018. The peculiarity of the ethno-social conflicts in the Russian labor market: comparative analysis of Russia, Great Britain and Germany, *Espacios, Especial*, 39(22): 12.

Policies and Regulations to Combat Precarious Employment. 2011. International Labour Organization. Retrieved from: https://www.ilo.org/wcmsp5/groups/public/@ed_dialogue/@actrav/documents/meetingdocument/wcms_164286.pdf

Precarious Employment in Europe. Part 1: Patterns, Trends and Policy Strategy. 2016. European Parliament. Retrieved from: http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587285/IPOL_STU(2016)587285_EN.pdf

Rodgers, G. 1989. *Precarious Jobs in Labour Market Regulation: The Growth of Atypical Employment in Western Europe*, Brussels: International Labour Organisation.

Rogach, O.V.; Frolova, E.V.; Kirillov, A.V.; Bondaletov, V.V.; Vinichenko, M.V. 2016. Development of favourable learnıng envıronment and labor protectıon ın the context of harmonızatıon of socıal interactıon of educatıonal system objects, *IEJME – Mathematics Education*, 11(7): 2547-2558.

Rogach, O.V.; Frolova, E.V.; Ryabova, T.M. 2018. Theory of "trust" in the focus of expectation study concerning educational space key actors, *European Journal of Contemporary Education*, 7(2), 392-399.

Rogach, O.V.; Ryabova, T.M.; Frolova, E.V.; Evstratova, T.A.; Kozyrev, M.S. 2018. Social and psychological climate in state, *Espacios*, 39(11): 19.

Romer, D. 2006. *Advanced Macroeconomics*, 3rd ed., New York: McGraw-Hill/Irwin.

Salamon, M.W. 1987. *Industrial Relations*: Theory and Practice, London: Prentice-Hall International: 580.

Schmidt, M. 2002. News of Atypical Work in Germany: Recent Developments as to Fixed-term Contracts, Temporary and Part-time Work, *German Law Journal*, 7. Retrieved from: https://static1.squarespace.com/static/56330ad3e4b0733dcc0c8495/t/56b97d9fcf80a1b8c85c16e6/1454996895751/GLJ_Vol_03_No_07_Schmidt.pdf

Sciarra, S. 2004. *Employment Policy and the Regulation of Part-time Work in the European Union*, Cambridge, UK; New York: Cambridge University Press.

Vasile, O., Androniceanu, A. 2018. An overview of the Romanian asylum policies. *Sustainability* 10(5), 1461; p. 1-22. Doi: https://doi.org/10.3390/su10051461

Veretekhina, S.V.; Zhuravlyov, M.S.; Shmakova, E.G.; Soldatov, A.A.; Kotenev, A.V.; Kashirin, S.V. 2018. Analog Sound Signals Digitalization and Processing, *Modern Journal of Language Teaching Methods*, 8(3): 39-54.

Vinichenko, M.V.; Karácsony, P.; Demchenko, T.S.; Melnichuk, A.V.; Makuchkin, S.A. 2017. Satisfaction of Employees of Moscow Region Organizations by Implementation of Youth Personnel Policy, *Eurasian Journal of Analytical Chemistry*, 12(5b): 697-704. https://doi.org/10.12973/ejac.2017.00203a

Vinichenko, M.V.; Kirillov, A.V.; Frolova, E.V.; Kaurova, O.V.; Makushkin, S.A. 2016. Monitoring of working conditions and the nature of their influence on health of students and academic staff, *International Journal of Environmental and Science Education*, 11(11): 4564-4577.

Vinichenko, M.V.; Kirillov, A.V.; Maloletko, A.N.; Frolova, E.V.; Vinogradova, M.N. 2018. Motivation of University Senior Staff in the Process of Restructuring Higher Education Institutions, *Croatian Journal of Education*, 20(1): 199-232. https://doi.org/10.15516/cje.v20i1.2571

World Employment and Social Outlook. 2015. The Changing Nature of Jobs, International Labour Organization. Retrieved from: https://www.ilo.org/global/research/global-reports/weso/2015-changing-nature-of-jobs/lang--en/index.htm

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THE EFFECT OF AUDIT QUALITY AND DEGREE OF INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS) CONVERGENCE ON THE ACCRUAL EARNINGS MANAGEMENT IN ASEAN COUNTRIES

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Abstract. The purpose of this research is to analyze the effect of the degree of convergence of International Financial Reporting Standards (IFRS) and Audit Quality on company's accrual earnings management. In addition, this research also aims to investigate the moderation role of the degree of convergence of IFRS on the relationship between audit quality and company's accrual earnings management. This research covers several Association of Southeast Asian Nations (ASEAN) countries, consists of Philippines, Indonesia, Malaysia, Singapore, Thailand, and Vietnam. The methodology used in this research is the multiple regressions by using Least Square method. This study finds that the higher the degree of convergence of IFRS, the lower discretionary accruals, which means the higher quality of earnings. Meanwhile, the size and specialization of the auditor are not significantly effecting accrual earnings management which is described by the value of discretionary accruals. The results imply that being audited by Big-4 or specialized accounting firm, does not guarantee the lower discretionary accruals, which means do not guarantee that the accrual earnings management will be better. On the other hand, the degree of convergence of IFRS did not have a moderating role that influence the effect of audit quality on the accrual earnings management.

Keywords: accrual earnings management; audit quality; ASEAN; convergence; International Financial Reporting Standards (IFRS)

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1. Introduction

Financial reports are required by various parties, such as investors and creditors for decision making. One of the first factors considered for decision-making is the company's ability to generate earnings. Companies with earnings that tend to remain stable and increasing are considered a company with good performance so that it is considered attractive to investors who will invest their capital or for the management to do business development. Given the importance of the income statement in the performance appraisal, the quality of the earnings reported in

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the income statement of the firm is always a concern. Dichev et al. (2016) states that earnings are said to be in high quality when earnings meet certain characteristics such as consistent, sustainable and predictable, reflects cash flow, has no one-time or special item, neutral, presented in a timely manner, clearly presented, and putting forward the principle of conservatism. On the other hand, to meet investor expectations and optimized benefits received, management has a tendency to perform treatment on earnings known as earnings management so that earnings submitted to company owners appear relatively stable (Gerayli, et al., 2011; Narkunienė, Ulbinaitė, 2018; Zemguliene, Valukonis, 2018).

One of the most widely adopted accounting standards is the International Financial Reporting Standards (IFRS). IFRS requires full disclosure of each component of the financial statements. With this standard, the information disclosed by the company will be more complete, so users of financial statements can assess the company's performance with comprehensive and accurate. In addition, a standard used by all parties can improve comparability so that users of financial statements can make decisions more precisely. Thus, the adoption of IFRS is expected to improve the quality of financial statements, and the quality of earnings in particular. Prior studies, as stated by Anggraeni and Wardhani (2017), state that the use of international accounting standards has a mixed impact on various financial aspects of firms such as price reaction (Beatty, Chamberlain, & Magliolo, 1996), cost of capital (Karamanou & Nishiotis, 2009), information asymmetry (Cuijpers & Buijink, 2005) and accounting quality (Ashbaugh & Pincus, 2001; Barth et al., 2008).

To ensure that financial statements are presented in accordance with applicable accounting standards, independent external verification is required. Therefore, companies need the services of independent external auditors. An auditor provides audit services to the client's financial statements to provide assurance to the users of financial statements that the financial statements have been prepared in accordance with applicable accounting standards so that the financial statements are reliable in decision making. Auditing services also serve as a monitoring tool for potential conflicts of interest between owners and managers and shareholders with different amounts of ownership, and can reduce asymmetrical information between managers and corporate stakeholders by allowing outsiders to check the validity of financial statements (Jensen and Meckling, 1976).

As the information becomes more complete, users of financial statements will be increasingly critical in demanding the quality of earnings reported in the financial statements. These circumstances create pressure for auditors to improve the quality of audits conducted so as to ensure that reported earnings and financial statements produced are of high quality (Barth et al., 2008). Thus, it appears that IFRS convergence conducted by each country not only affects the quality of earnings directly, but also has an influence on the relationship between audit quality and earnings quality.

Previous studies have done a lot of research on the effect of IFRS convergence with earnings quality, for example Daske and Gunther (2006) state that IFRS convergence improves the quality of financial statements and Barth et al. (2008) examining accounting quality before and after the introduction of IFRS by using a sample of 327 companies in 21 countries that have voluntarily adopted IAS between 1994 and 2003. On the other hand, many studies have examined the effect of audit quality on earnings quality, eg research Gerayli et al. (2011). However, no research has been found to examine the effect of moderation of IFRS convergence on the relationship between audit quality and earnings quality. This research will try to fill the gap and complete the results from previous studies. This study aims to examine the effect of IFRS convergence and audit quality on the earnings quality measured by accrual earnings management. This study also aims to examine whether the IFRS convergence can strengthen the effect of audit quality on earnings management.

This study contributes the literature in several ways. First, this study examines the impact of IFRS and audit quality on earnings management in the context of countries in ASEAN that have high variations in the financial reporting environment. Previous research examined this in the context of developed countries or regions that have more homogeneous reporting environment characteristics. Second, in contrast to previous studies which mostly examined the impact of IFRS on the quality of financial reports by using a dummy variable by classifying a

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country adopting or not adopting IFRS, this study measures IFRS convergence by scoring against the prevailing standards in a country by using adoption levels scores. Third, this study examines the moderating effect of IFRS on the relationship between audit quality and earnings management which based on our knowledge has not been examined by previous research.

This study will take samples from six ASEAN countries: Philippines, Indonesia, Malaysia, Singapore, Thailand and Vietnam. The ASEAN region is chosen because it is an emerging region with a growing economy, so that the characteristics of the existing companies in ASEAN may be different from the companies in Europe or America that have been studied in previous research. In addition, IFRS convergence in the ASEAN region is conducted with different approaches in accordance with the policies of each country so that the degree of convergence of IFRS in ASEAN countries becomes diverse. It is an interesting phenomenon to be studied.

2. Theory, Literatures Review and Hypothesis Development

2.1. Agency Theory

Jensen & Meckling (1976) define agency relations as contracts where one or more people acting as principals (ie shareholders / shareholders) appoint other people as agents (ie managers) to perform services for the interests of principals, including delegating power in decision making to agent. The agency relationship will cause conflict if the agent tries to maximize his/her personal utility and at the same time they sacrifice the intrest of the principals. Agents that have more information regarding companies are vulnerable to taking opportunistic actions which aim to increase wealth for the agent itself that can be detrimental to investors. To minimize this risk, the principal pays the cost to control and monitor the performance of the managers (agents) which is called the agency cost.

One way to minimize the risk of expropriation is to minimize the possibility of asymmetric information. High quality of financial reports are one mechanism to minimize asymmetric information. Agent's personal interest and probabilities of the information asymmetries can lead to the question about the reliability of information and the quality of earnings, which impacts on the impairment of trust of the principals to the agent. Several mechanisms that oftenly used by the company to align the interests of agents with principals. The mechanisms can be at country level such as investor protection, legal quality, and also accounting standard adopted by a country or at firm level such as remuneration package, firm level corporate governance, and also audit quality. Accounting standard adopted in a country can be a mechanism to improve the reporting environment. Moreover, audits also serve a vital economic purpose in the monitoring mechanism and also play an important role in increasing the quality of financial reporting.

2.2. Hypothesis Development

Referring to the research of Dichev et al. (2016), the earnings are said to be in a high quality if it meets certain characteristics such as consistent, sustainable and predictable, reflects cash flow, lacks one-time or special items, is neutral, presented in a timely manner, presented clearly, and put forward the principle of conservatism. The quality of corporate earningss is influenced by external factors and internal factors of the company, among others: (i) the convergence level of countries' standards with IFRS; and (ii) audit quality.

The accounting standards is one of the country level monitoring mechanism for the company. The applicable accounting standards in a country will determine the quality of financial information, especially with regard to earnings information, generated by companies in that country. The use of different accounting standards leads to variations in recording and reporting that allow for more variety of gaps and variations that management can perform in the framework of earnings management that will reduce earnings quality (Dichev et al., 2016). IFRS adoption as an international accounting standard guarantees high reporting quality, because it is based on international standards supported by the IASB as a competent world-class standard setter. With the adoption of

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IFRS, the variety across countries in the accounting procedure and accounting practices can be reduced so that the possibility of management manipulating records and reporting can also be reduced. Moreover, IFRS also have more disclosure requirement compare to local accounting standards in many countries (Pirzada, K., 2016).

Several studies related to the role of accounting standards on the processes and results of financial reporting (Cohen, 2003; Daske and Gunther, 2007; Enomoto et al., 2015; Halabi & Zakaria, 2013) show that international accounting standards positively affects financial reporting quality by increasing the comparability and reliability of the financial statements. The study proves that IFRS adoption decreases the level of discretionary accruals, which has a positive effect on earnings quality. In Asian context, Wardhani et al. (2015) also show that the adoption of IFRS positively affect the financial reporting quality. This study use accrual earnings management to proxy earnings quality, the lower earnings management reflect higher earnings quality. Thus, it can be proposed the following hypothesis:

Hypothesis 1: The degree of IFRS convergence to local accounting standards has a negative effect on the accrual earnings management.

In addition to accounting standards, audit quality also plays a role in the financial reporting process is to encourage the application of accounting standards. Based on agency theory by Jensen and Meckling (1976), audit process is one of the mechanism in the monitoring process. Auditor provide independent verification services on the financial statement so that creadibility of information is increased. In order to monitor the agent, the principals require high quality set of information. An audit process can provide the principal a verification of the information disclosed by management.

DeAngelo (1981) defines audit quality as a market assessment of the likelihood that the auditor will find an offense in the client's accounting system and report the violation. He argues that audit quality increases with audit firm size because large audit firms possess higher ability to do specialization and innovation through technology. Thus, the likelihood of a large audit firm to find violations in the corporate accounting system is greater than that of a small audit firm. Given the resources and comparative advantages possessed by large auditors, the detection and correction of corporate financial reporting mistakes can be done better.

According to Gerayli et al. (2011), audit quality has several dimensions of audit firm size (Big-4 audit firm and non Big-4 audit firm), independence and specialization of auditor industry. According to Craswell et al. (1995), large audit firms provide more human resources for staff training and skills development in certain industries than small audit firms, and also have a better position to negotiate with clients. Therefore, Big-4 auditors has good audit quality (Gerayli et al., 2011). The industry specialization of the auditor was originally defined as an auditor auditing more than 10 percent of the company's revenue in one industry (Craswell et al., 1995). After the consolidation of the Big-8 became the Big-6, the specialization measure became 15 percent as a threshold (Krishnan 2003) to 20 percent (Dunn et al. 2000). According to (Solikhah, B., Della Firmansyah, N. and Pirzada, K. 2017), the Auditor is said to be a specialist if the auditor audits 15% of the total companies in the industry, according to Craswell et al. (1995). This classification is based on the percentage of the number of companies audited by auditors in an industry (Balsam et al., 2003). Based on the explanation above, the hypotheses are as follow:

Hypothesis 2a: The earnings management of firms audited by auditors of Big-4 is lower than the earnings management of firms audited by auditors of non Big-4.

Hypothesis 2b: The earnings management of firms audited by auditor with industry specialization is lower than the the earnings management of firms audited by auditors without industry specialization.

Auditors provide audit service to the company by providing an assurance to users of financial statements and provide an opinion whether the financial statement is fairly represent in accordance with applicable accounting standards so that financial statements are reliable in decision making. With IFRS characteristics requiring full disclosure, auditors are also required to improve the quality of their audits to ensure the quality of financial

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statements. On the other hand, IFRS as a universal accounting standard causes information obtained by users of financial statements more comprehensive and comprehensive.

As the information becomes more complete, users of financial statements will be increasingly critical in demanding the quality of earnings reported in the financial statements. This situation creates pressure for auditors to improve the quality of audits conducted so as to ensure that the resulting financial statements have high quality (Barth et al., 2008). Thus, it appears that IFRS convergence conducted by each country not only affects the quality of earnings directly, but also has an influence on the relationship between audit quality and earnings quality. Thus, it can be proposed the following hypothesis:

Hypothesis 3a: The level of convergence to IFRS will strengthen the negative effect of auditor's size on earnings management

Hypothesis 3b: The level of convergence to IFRS will strengthen the negative effect of auditor's industry specialization on earnings management

3. Research Methodology

The data used in this research is financial report data from companies listed on the stock exchange, obtained from Thomson Reuters EIKON database with sample company selection method used in this research is purposive sampling. The company criteria sampled are listed on the stock exchanges in the ASEAN countries: Philippines, Indonesia, Malaysia, Singapore, Thailand and Vietnam, excluding the financial industry and have complete data in the period 2014-2015. In addition, data on the similarities and differences between local accounting standards of a country and IFRS issued by PricewaterhouseCoopers (2015) and Deloitte (2016) are used. Based on the sample selection procedure, 503 sample companies were obtained. We also treat outlier by delating observations that fall outside the average ± 3 times standard deviation for each variable in all research model.

The dependent variable of this study is the discretionary accruals value which is the residual value of Jones Model with performance-matched discretionary accruals based on the research of Dechow et al. (1995). To obtain the residual value, regression is done by Least Square method for each data group made based on country and industry field which is reflected in the code of Global Industry Classification Standard (GICS) Sector Code that exist in each company. Industrial sectors with at least 20 samples of firms in a country are grouped into one separate group, while industry sectors with samples of less than 20 companies are included in the 'Others' group.

After data grouping, regression is done to find the residual value of the following Jones Model:

$$\frac{ACC}{TA_{-1}} = a_0 \frac{1}{TA_{-1}} + a_1 \frac{PPE}{TA_{-1}} + a_2 \frac{\Delta SALES}{TA_{-1}} + \varepsilon$$

Where:

ACC = total accrual of firm i in period t

TA-1 = total initial asset of period

PPE = gross property, plant, and equipment.

ΔSALES = change of company's sales i in period t-1 to t.

The independent variable in this research is the level of IFRS convergence and audit quality. The model used in this research also use control variable that is firm size, financial leverage, operating cash flow ratio, growth prospect, country market capitalization, loss and dummy variable of country with Philippines as reference. In this research, four models are created which each will be regress by using least square method to describe the relationship between independent variable and dependent variable:

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Model 1a

ADACi = b0 + b1IFRSi + b2BIGi + b3SIZEi + b4LEVi + b5OCFi + b6GROWi + b7LOSSi + b8MCAPi + b9-13CRTYi +εi

This model illustrates the relationship between the degree of IFRS convergence and audit quality measured by the auditor's size on company's on discretionary accruals.

Model 1b

ADACi = b0 + b1IFRSi + b2SPECi + b3SIZEi + b4LEVi + b5OCFi + b6GROWi + b7LOSSi + b8MCAPi + b9-13CRTYi +εi

This model illustrates the relationship between the degree of IFRS convergence and audit quality as measured by the auditor industry's specialization on company's discretionary accruals.

Model 2a

ADACi = b0 + b1IFRSi + b2BIGi + b3IFRSi*BIGi + b4SIZEi + b5LEVi + b6OCFi + b7GROWi + b8LOSSi + b9MCAPi + b10-14CRTYi +εi

This model illustrates the role of moderation effect between the degree of IFRS convergence and audit quality as measured by the auditor's size on discretionary accruals.

Model 2b

ADACi = b0 + b1IFRSi + b2SPECi + b3IFRSi*SPECi + b4SIZEi + b5LEVi + b6OCFi + b7GROWi + b8LOSSi + b9MCAPi + b10-14CRTYi +ε

This model illustrates the role of moderation effect between the degree of IFRS convergence and audit quality as measured by the auditor's industry specialization on discretionary accruals.

The operationalization of the variables of the four models above are as follow:

ADAC = Natural logarithm of absolute discretionary accruals using modified jones model
IFRS = Index of IFRS convergence degree, average score of scoring result of each aspect of IFRS against standard applicable in each country with scoring as follows:
- 1, if no local standard is equivalent to IFRS standard.
- 2, if there are local standards equivalent to IFRS standards but not the same.
- 3, if there are local standards equivalent to IFRS standards and the same but with certain exceptions.
- 4, if there are local standards equivalent to IFRS standards and the same for all material aspects.

BIG = Variable dummy auditor. 1 for companies audited by Big 4 auditors, and a value of 0 for Non-Big 4
SPEC = Dummy variables of auditor specialization. 1 if the company is audited by the auditor industry specialization, and 0 if not.
SIZE = Company size, natural logarithm of total company asset
LEV = Financial Leverage, Total Debt / Total Assets
OCF = Operating Cash Flow Ratio, cash flow from operating activities / total assets
GROW = Growth Prospect, Market-to-book value ratio
LOSS = Dummy variable, 1 for negative net profit and 0 for vice versa.
MCAP = Country Market Capitalization / GDP.
CRTY = Dummy variable, 1 for the country concerned and 0 for other value, by making the Philippines as a reference.

In each model will be tested classical assumptions that include multicollinearity test, heteroscedasticity test, autocorrelation test and data normality test.

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4. Analysis of the Result

4.1. Descriptive Statistics

Based on the data that has been obtained, this research has 503 sample of companies. Of the 503 companies there are 103 data which is the outlier so that is removed from the sample. In addition, there are two companies that are excluded from the sample because they have negative equity where the total liability value is greater than the total asset value so that the data used in the regression model is 398 data (Table 1).

Table 1. Descriptive Statistic

Variabel	N	Mean	Median	Max	Min	Stdev
ADAC	398	3.3119	3.3594	4.6600	1.9106	0.5129
IFRS	398	3.3675	3.6905	3.8571	2.3810	0.4958
SIZE	398	20.2696	20.1445	24.8235	16.6766	1.5670
LEV	398	0.0919	0.0878	0.2692	0.0055	0.0594
OCF	398	0.0825	0.0795	0.3373	-0.1561	0.0838
GROW	398	0.5560	0.5493	5.2326	-1.6088	0.8306
MCAP	398	4.4836	4.4801	5.3873	3.2882	0.6009
Variabel	N	% of 0		% of 1		% Total
BIG	398	24.59%		75.41%		100%
SPEC	398	20.37%		79.63%		100%
LOSS	398	90.73%		9.37%		100%

From the above calculations, in IFRS score variables for example, it appears from the score of 1-4 used, the average convergence rate of the six countries ranges in number 3, which means that there is a local standard equivalent to the IFRS standard and the same but with the exception certain. Appear more than 75% of the sample firms are audited by Big-4 auditors and over 79% of companies being sampled are audited by auditors with industry specialization. From the above data, it appears that the percentage of firms audited by auditors with industry specialization is larger than firms audited by Big-4 auditors, which indicates that in the countries sampled this study, the auditor with industry specialization is not always Big-4 auditors.

4.2. Analysis of Regression Result of Model 1a

The regression results of Model 1a is presented in table 2 bellow. In the t test analysis for each variable, the IFRS variable (Degrees of IFRS Convergence) has a significant effect on the quality of earnings described by the discretionary accruals with the direction of the negative relationship. That is, the higher the degree of convergence IFRS, the lower the possibility of discretionary accruals which means the quality of corporate earnings will be better. These results are consistent with the research of Daske and Gunther (2006), Chiu et al. (2013), Dimitropoulos et al. (2013) and Ismail et al. (2013) that examines the effect of standards on the quality of financial statements with the result that in general the universal standard (IFRS) has a positive effect on the quality of financial statements.

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Table 2. Regression Result of Model 1a

Model 1a
ADACi = b0 + b1IFRSi + b2BIGi + b3SIZEi + b4LEVi + b5OCFi + b6GROWi + b7LOSSi + b8MCAPi + b9-13CRTYi +εi

Dependent Variable: ADAC

Independent Variable	Expected Sign	Coefficient	Std. Error	t-Statistic	Prob.	
C	?	-0.1411	0.6474	-0.4433	0.4079	
IFRS	-	-0.3478	0.1280	-5.2144	0.0046	***
BIG	-	-0.0844	0.0835	-2.0110	0.1497	
SIZE	+/-	0.1529	0.0252	5.9836	0.0000	***
LEV	+/-	-0.2900	0.0855	-3.4080	0.0008	***
OCF	+/-	1.4199	0.4458	3.1011	0.0014	***
GROW	+/-	-0.1104	0.0468	-2.4034	0.0167	**
LOSS	+/-	-0.7802	0.1187	-6.5816	0.0000	***
MCAP	+/-	0.2476	0.1330	1.8388	0.0618	*
D_COUNTRY	+/-	Included				
N				398		
Adjusted R-squared				0.4008		
Prob(F-statistic)				0.0000		

Table Description:
*** Significant at level 1%; ** Significant at the 5% level; * Significant at level 10%
The dependent variable in this model is ADAC. The independent variables in this model are: (i) IFRS: Index of IFRS convergence degree in a country; (ii) BIG: Dummy auditor variable, value 1 for companies audited by Big 4 auditor, and value 0 for Non-Big 4. Big 4 auditors are Ernst & Young, Pricewaterhouse Cooper, Deloitte, and KPMG; (iii) SIZE: Natural logarithm of the total assets of the company; (iv) LEV: Natural logarithm of total debt / total assets; (v) OCF: Natural logarithm of cash flows from operating activities / total assets; (vi) GROW: Natural logarithm of market value / book value; (vii) LOSS: Dummy variable, 1 for negative net profit and 0 for vice versa; (viii) MCAP: Country Market Capitalization / GDP; (ix) CRTY Dummy variables, 1 for the country concerned and 0 for other, the Philippines as country of reference.

The results of this study prove that the adoption of IFRS as an international accounting standard in general ensures high reporting quality. Although the adoption of IFRS in sample countries varies, in general the use of international accounting standards has had a positive impact on financial reporting with increasing comparability and reliability of financial statements. Thus, Hypothesis 1: The degree of IFRS convergence to local accounting standards positively affects the quality of a company's earnings received.

The BIG variable (Auditor Size) has no significant effect on the quality of the earnings described by the discretionary accruals value with the direction of the negative relationship. From the data obtained, visible from the six sample countries, 76.25% of the sample companies were audited by Big-4 auditors. That is, from the companies being sampled, it appears that companies with good earnings quality as well as companies with poor quality earnings turn out to be mostly both audited by auditors of Big-4 auditors and associated. Thus, the level of audit quality impact in this model is measured by auditor's size to be insignificant. From the above results, it can be concluded that auditor size variables have no significant effect on the quality of earnings described by the value of discretionary accruals, so Hypothesis 2a is rejected.

Related to control variables, SIZE (Company Size) and OCF (Operating Cash Flow Ratio) have a significant effect on the quality of earnings described by the value of discretionary accruals with the direction of positive relationship. That is, the larger the size of the company or the ratio of cash flows from operating activities divided by total assets, the higher the possibility of discretionary accruals which means the quality of corporate earnings will decrease. Meanwhile, other control variables such as GROW (Growth Prospect) have a significant effect on the quality of earnings described by the discretionary accruals with the direction of the negative relationship.Variable LEV (Leverage) have a significant effect to the earnings quality which is described with the value of discretionary accruals with the direction of negative relationship. The LOSS (Loss) variable also has a

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significant effect on the earnings quality described by the discretionary accruals with the direction of the negative relationship. That is, in companies that experience losses, the higher the possibility of discretionary accruals which means the earnings quality will decrease. The Country Market Capitalization (MCAP) variable has no significant effect on the earnings quality described by the discretionary accruals with the direction of the positive relationship. That is, in countries with well-developed capital markets, it does not guarantee the possibility of discretionary accruals will be lower, which means that in countries with well-developed capital markets, does not guarantee the earnings quality will be higher.

4.3. Analysis of Regression Result of Model 1b

Model 1b is a model without a moderation relationship testing Hypothesis 1 that is the degree of convergence IFRS to local accounting standards have a positive effect on the quality of a company's earnings indicated by the negative impact on discretionary accruals and Hypothesis 2b is the industry specialization auditor positively affect the quality of a company's earnings which is indicated by a negative influence on discretionary accruals. From the regression results, obtained the following information (Table 3):

Table 3. Regression Result of Model 1b

Model 1b ADACi = b0 + b1IFRSi + b2SPECi + b3SIZEi + b4LEVi + b5OCFi + b6GROWi + b7LOSSi + b8MCAPi + b9-13CRTYi +εi						
Dependent Variable: ADAC						
Independent Variable	Expected Sign	Coefficient	Std. Error	t-Statistic	Prob.	
C	?	-0.0605	0.6507	-0.1860	0.4689	
IFRS	-	-0.3501	0.1288	-5.2970	0.0044	***
SPEC	-	-0.0011	0.0860	-0.0242	0.4758	
SIZE	+/-	0.1463	0.0249	5.6643	0.0000	***
LEV	+/-	-0.2805	0.0860	-3.2448	0.0009	***
OCF	+/-	1.4083	0.4387	2.9780	0.0022	***
GROW	+/-	-0.1046	0.0466	-2.3003	0.0218	**
LOSS	+/-	-0.8048	0.1160	-6.7766	0.0000	***
MCAP	+/-	0.2486	0.1332	1.8125	0.0624	*
D_COUNTRY	+/-	Included				
N			398			
Adjusted R-squared			0.4914			
Prob(F-statistic)			0.0000			
Table Description: *** Significant at level 1%; ** Significant at the 5% level; * Significant at level 10% The dependent variable in this model is ADAC. The independent variables in this model are as follows: (i) IFRS: Index of IFRS convergence degree in a country; (ii) SPEC: Dummy auditor variable, value 1 for companies audited by auditor with industry specialization, and value 0 for other; (iii) SIZE: Natural logarithm of the total assets of the company; (iv) LEV: Natural logarithm of total debt / total assets; (v) OCF: Natural logarithm of cash flows from operating activities / total assets; (vi) GROW: Natural logarithm of market value / book value; (vii) LOSS: Dummy variable, 1 for negative net profit and 0 for vice versa; (viii) MCAP: Country Market Capitalization / GDP; (ix) CRTY Dummy variables, 1 for the country concerned and 0 for other, the Philippines as country of reference						

The SPEC (Auditor Specialization) variable has no significant effect on the earnings quality described by the discretionary accruals value despite the negative direction of the relationship. That is, there does not seem to be a link between auditor specialization and earnings quality. This is in line with the conclusions drawn by Gerayli et al. (2011) evaluating the effect of audit quality (judging by the size of audit firm and auditor industry specialization) on earnings quality and the conclusion of Enomoto et al. (2015) comparing the effect of investor protection to earnings management in 38 countries in the world and then drawing the conclusion that in general

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audit quality control (in this case indicated by auditor specialization) has no effect on earnings management. In line with the data used for model 1a, on data extracted from public companies in six ASEAN countries sampled, 79.50% of the sample companies have been audited by auditors with industry specializations. That is, most of the companies being sampled have been audited by auditors with industry specializations which show that in general most of the companies that have been sampled have good audit quality. From the sample companies, it appears that companies with good earnings quality as well as companies with poor earnings quality turn out to be mostly audited by a specialist auditor, so the level of audit quality impact in this model is measured by specialization the auditor becomes insignificant. Thus, Hypothesis 2b: Auditor specialization positively affects the earnings quality of a company is rejected.

From the two models above, it appears that the effect of audit quality on earnings quality in sample countries is not significant. This is illustrated in the descriptive statistics which show that the company being sampled, whether the quality of the company's earnings is good or the quality of the company's earnings is not good, most have been audited by a qualified auditor, as measured by association with audit firm The-Big-4 or by auditors who are considered to have specialized in one industry area in each country. Thus, the effect of audit quality on the quality of corporate earnings is not significant.

4.4. Analysis of Regression Result of Model 2a

Model 2a is a model with moderation relation depicting Hypothesis 3a that the level of IFRS convergence to local accounting standard will strengthen the positive influence of audit quality on earnings quality. From the regression results, obtained the following information (Table 4):

Table 4. Regression Result of Model 2a

Model 2a ADACi = b0 + b1IFRSi + b2BIGi + b3IFRSi*BIGi + b4SIZEi + b5LEVi + b6OCFi + b7GROWi + b8LOSSi + b9MCAPi + b10-14CRTYi +εi						
Dependent Variable: ADAC						
Independen Variable	Expected Sign	Coefficient	Std. Error	t-Statistic	Prob.	
C	?	-0.3125	0.7599	-0.4091	0.6667	
IFRS	-	-0.2828	0.1873	-3.0714	0.0628	*
BIG	-	-0.1590	0.5438	-0.5656	0.3743	
IFRS*BIG	-	-0.0743	0.1570	-0.8956	0.3240	
SIZE	+/-	0.1542	0.0259	5.9131	0.0000	***
LEV	+/-	-0.2926	0.0839	-3.3885	0.0007	***
OCF	+/-	1.4402	0.4561	3.1769	0.0015	***
GROW	+/-	-0.1102	0.0454	-2.3461	0.0169	**
LOSS	+/-	-0.7760	0.1136	-6.5284	0.0000	***
MCAP	+/-	0.2479	0.1334	1.7362	0.0697	*
D_COUNTRY	+/-	Included				
N			398			
Adjusted R-squared			0.4934			
Prob(F-statistic)			0.0000			
Table Description: *** Significant at level 1%; ** Significant at the 5% level; * Significant at level 10% The dependent variable in this model is ADAC. The independent variables in this model are : (i) IFRS: Index of IFRS convergence degree in a country; (ii) SPEC: Dummy auditor variable, value 1 for companies audited by auditor with industry specialization, and value 0 for other; (iii) SIZE: Natural logarithm of the total assets of the company; (iv) LEV: Natural logarithm of total debt / total assets; (v) OCF: Natural logarithm of cash flows from operating activities / total assets; (vi) GROW: Natural logarithm of market value / book value; (vii) LOSS: Dummy variable, 1 for negative net profit and 0 for vice versa; (viii) MCAP: Country Market Capitalization / GDP; (ix) CRTY Dummy variables, 1 for the country concerned and 0 for other, the Philippines as country of reference.						

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From the above regression results, the R-squared value of 0,5164, which means the independent variable in this model is able to explain the dependent variable of approximately 51.64%. Thus, the model used can be quite good because it can represent variation of dependent variable by more than 50%. Independent variables have F-statistic significance with significance level less than 5%. Thus the regression results of this model indicate that together independent variables (IFRS, BIG, SIZE, LEV, OCF, GROWTH, LOSS, MCAP and CRTY) affect the earnings quality described by the value of discretionary accruals.

In the t test analysis per variable, the IFRS variable (Degrees of IFRS Convergence) has a significant effect on the earnings quality described by the discretionary accruals with the direction of the negative relationship. This result is in line with the result of the previous model. As for the BIG variable (Auditor Size) as model 1a does not significantly affect the earnings quality described by the discretionary accruals value with the direction of the negative relationship. Similarly, the BIG * IFRS variable which in this model has no significant effect and does not affect the relationship between independent variables with the dependent variable. Thus, in this model, the IFRS variable is simply a Moderator Predictor which means it only has a role as an independent predictor variable in the established relationship model. Thus, it can be concluded that hypothesis 3a which states the level of IFRS convergence to local accounting standards will strengthen the positive effect of auditor size on the quality of earnings is not accepted.

IFRS as a universal accounting standard causes information obtained by users of financial statements more complete and comprehensive. As the information becomes more complete, users of financial statements will be increasingly critical in demanding the quality of earnings reported in the financial statements. These circumstances create pressure for auditors to improve the quality of audits conducted so as to ensure that reported earnings and financial statements produced are of high quality (Barth et al., 2008). However, in ASEAN countries with varying levels of IFRS convergence, there appears to be an adaptation between the audit process of IFRS convergence applied to individual countries. Thus, the varying levels of IFRS convergence provide flexibility for both companies and auditors so that the implementation of IFRS does not fully appear to affect the relationship between audit quality to earnings quality. Thus, hypothesis 3a which states IFRS convergence rate to local accounting standards will reinforce the positive effect of auditor's audit firm measure on earnings quality, not accepted.

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4.5. Analysis of Regression Result of Model 2b

Model 2b is a model with a moderation relation depicting Hypothesis 3b ie that IFRS convergence level to local accounting standard strengthens the positive influence of auditor industry's specialization on earnings quality. From the regression results, obtained the following information (Table 5):

Table 5. Regression Result of Model 2b

Model 2b ADACi = b0 + b1IFRSi + b2SPECi + b3IFRSi*SPECi + b4SIZEi + b5LEVi + b6OCFi + b7GROWi + b8LOSSi + b9MCAPi + b10-14CRTYi +εi						
Dependent Variable: ADAC						
Independent Variable	Expected Sign	Coefficient	Std. Error	t-Statistic	Prob.	
C	?	0.1321	0.7387	0.1744	0.8366	
IFRS	-	-0.4208	0.2020	-4.2331	0.0161	**
SPEC	-	-0.2815	0.5678	-1.0061	0.2999	
IFRS*SPEC	-	-0.0828	0.1626	-1.0000	0.2971	
SIZE	+/-	0.1450	0.0255	5.7608	0.0000	***
LEV	+/-	-0.2916	0.0862	-3.3587	0.0009	***
OCF	+/-	1.3757	0.4571	3.0238	0.0020	***
GROW	+/-	-0.1078	0.0466	-2.2610	0.0216	**
LOSS	+/-	-0.8011	0.1185	-6.7875	0.0000	***
MCAP	+/-	0.2505	0.1346	1.8896	0.0548	*
C_IND	+/-	0.2374	0.1469	1.6414	0.0906	*
C_MAL	+/-	0.1885	0.1393	1.2891	0.1800	
C_SIN	+/-	-0.0308	0.1847	-0.1723	0.8403	
C_THA	+/-	0.4846	0.0771	6.2714	0.0000	***
C_VIE	+/-	0.3329	0.1016	3.2513	0.0013	***
N				398		
R-squared				0.5279		
Adjusted R-squared				0.5005		
Prob(F-statistic)				0.0000		

Table Description:
*** Significant at level 1%; ** Significant at the 5% level; * Significant at level 10%
The dependent variable in this model is ADAC. The independent variables in this model are: (i) IFRS: Index of IFRS convergence degree in a country; (ii) SPEC: Dummy auditor variable, value 1 for companies audited by auditor with industry specialization, and value 0 for other; (iii) SIZE: Natural logarithm of the total assets of the company; (iv) LEV: Natural logarithm of total debt / total assets; (v) OCF: Natural logarithm of cash flows from operating activities / total assets; (vi) GROW: Natural logarithm of market value / book value; (vii) LOSS: Dummy variable, 1 for negative net profit and 0 for vice versa; (viii) MCAP: Country Market Capitalization / GDP; (ix) CRTY Dummy variables, 1 for the country concerned and 0 for other, the Philippines as country of reference.

In the t test analysis per variable, the IFRS variable (Degrees of IFRS Convergence) has a significant effect on the earnings quality described by the discretionary accruals with the direction of the negative relationship. These results are in line with the results of the previous model. The SPEC (Specialization Auditor) variable has no significant effect on the quality of earnings described by the discretionary accruals value despite having negative relationship direction. That is, there does not seem to be a link between auditor specialization and earnings quality. This is contrary to the conclusions drawn by Gerayli et al. (2011). Nevertheless, the results are similar to the results obtained by the previous model which draw the conclusion that in general audit quality control (in this case indicated by auditor specialization) has no effect on earnings management.

The IFRS * SPEC interaction variable in this model does not show a significant effect, and does not affect the significance of other independent variables as well. Thus, it appears that there is no moderating influence on this model. Thus, it can be concluded that hypothesis 3b which states the level of IFRS convergence to local

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accounting standards will reinforce the positive influence of the auditor industry's specialization on the quality of earnings is not accepted.

4.6. Additional Test

From the descriptive statistics that have been obtained, there appears to be a considerable difference between the countries sampled. Singapore, for example, which is the country with the highest GDP per capita among sample countries, has a per capita GDP of more than 50,000 USD by 2015, almost 25 times the GDP per capita in Vietnam, which is around 2,000 USD. Due to such a large difference, in addition regression is made for all four models and excluding data from Singapore. Thus, the remaining 348 sample data from five countries other than Singapore (Table 6).

Table 6. Regression Result Excluding Observation from Singapore

Variabel Independen	Ekspektasi Tanda	Model 1a			Model 1b			Model 2a			Model 2b		
		Coef	Prob.		Coef	Prob.		Coef	Prob.		Coef	Prob.	
IFRS	-	-0.2162	0.0019	**	-0.2122	0.0027	**	-0.1543	0.1068		-0.2056	0.0566	*
BIG	-	-0.1748	0.0001	***	-			0.0879	0.7486				
SPEC	-				-0.0604	0.1871					-0.0209	0.9380	
IFRSBIG	-							-0.0797	0.3228		-0.0126	0.8799	
IFRSSPEC	-												
C	Tidak ada	0.0660	0.8303		0.2430	0.4877		0.1016	0.1825		0.2164	0.5802	
Variabel Kontrol													
SIZE	+/-	0.1629	0.0000	***	0.1533	0.0000	***	0.1640	0.0000	***	0.1535	0.0000	***
LEV	+/-	-0.2436	0.0000	***	-0.2385	0.0000	***	-0.2435	0.0000	***	-0.2370	0.0000	***
OCF	+/-	1.6900	0.0000	***	1.6256	0.0000	***	1.6714	0.0000	***	1.5590	0.0000	***
GROW	+/-	-0.1495	0.0000	***	-0.1458	0.0000	***	-0.1482	0.0000	***	-0.1445	0.0000	***
LOSS	+/-	-0.9035	0.0000	***	-0.8987	0.0000	***	-0.8967	0.0000	***	-0.9028	0.0000	***
MCAP	+/-	0.1400	0.0524	*	0.1219	0.0872	*	0.1237	0.0825	*	0.1237	0.0893	*
N		350.0000			350.0000			350.0000			350.0000		
R-squared		0.5512			0.5241			0.5561			0.5168		
Adjusted R-squared		0.5341			0.5099			0.5349			0.5194		
F-statistic		40.8088			39.3264			37.3993			34.8622		
Prob(F-statistic)		0.0000			0.0000			0.0000			0.0000		

From the regression results shown in Table 9, it appears that in general the regression results obtained are similar to the regression results with the Singapore state included. The same relative value of significance is obtained in models 1b, 2a and 2b either by including country data of Singapore or not. As for model 1a, in the regression without entering Singapore data, the BIG variable value showing the dimension as the quality dimension of the auditor is significantly negative to the discretionary accruals, which means supporting the hypothesis 2a that the firm's earnings quality audited by the auditor of Big-4 auditors is higher than the quality the company's earnings audited by auditors of non Big-4 audit firms. When Singapore is included, this variable becomes insignificant because 91% or almost all public companies in Singapore are audited by Big-4 auditors, the highest among other countries.

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5. Conclusions

After analyzing the six sample countries, it can be concluded from this research that the higher the degree of IFRS convergence, the lower the likelihood of discretionary accruals, which means that the earnings quality will be better. These results are consistent with the research of Daske and Gunther (2006), Chiu et al., (2013), Dimitropoulos et al. (2013) and Ismail et al. (2013) that examines the effect of standards on the quality of financial statements with the result that in general the universal standard (IFRS) has a positive effect on the quality of financial statements.

The attributes associated with the quality of auditors, both the size and speciality of auditors have no significant effect on the quality of earnings described by the value of discretionary accruals. Meanwhile, the degree of IFRS Convergence does not indicate the effect of moderation on the relationship between audit quality as illustrated by size and auditor specialization with earnings quality. Thus, the degree of IFRS convergence has no role of moderation of IFRS convergence degree to the effect of audit quality with the earnings quality. This lack of significance is likely due to the fact that most sample companies have been audited by Big-4 auditors or audit firm with industry specialization.

Suggestions for further research are as follows: (i) added dimension of earnings quality dimension and updating of measurement method so that earnings quality measurement will be more accurate; (ii) The addition of auditor quality measurement so that auditor quality will be more accurately measured; (iii) The use of samples from different industries and regions with clear struc- tures, which may lead to differences that may occur between industries and regions; (iv) Research conducted within a period of several years, with the year through the crisis / recession, so it looks the difference in conditions between normal conditions with the conditions during the crisis.

References

Abbott, L.J., Parker, S. and Peters, G.F. 2004. Audit committee characteristics and restatements. Auditing: A Journal of Practice & Theory, 23(1), pp.69-87. https://doi.org/10.2308/aud.2004.23.1.69

Adibah Wan Ismail, W., Anuar Kamarudin, K., van Zijl, T. and Dunstan, K. 2013. Earnings quality and the adoption of IFRS-based accounting standards: Evidence from an emerging market. Asian Review of Accounting, 21(1), pp.53-73. https://doi.org/10.1108/13217341311316940

Anggraeni, M.D., and Wardhani, R. 2017. The Effect of Leverage and IFRS Convergence on Earnings Management through Real Activities Manipulation in Asia. Asian Journal of Business and Accounting, 10(1), pp.87-125. Available at: <https://ajba.um.edu.my/article/view/3476>. Date accessed: 16 Apr 2019.

Ashbaugh H., and Pincus M. 2001. Domestic Accounting Standards, International Accounting Standards, and the Predictability of Earnings. Journal of Accounting Research, 39, pp. 417-434. https://doi.org/10.1111/1475-679X.00020

Balsam, Steven, Jagan Krishnan, and Joon S. Yang. 2003. Auditor Industry Specialization and Earnings Quality. AUDITING: A Journal of Practice & Theory, September 2003, 22(2), pp. 71-97. https://doi.org/10.2308/aud.2003.22.2.71

Barth, M.E., Landsman, W.R. and Lang, M.H. 2008. International accounting standards and accounting quality. Journal of Accounting Research, 46(3), pp.467-498. https://doi.org/10.1111/j.1475-679X.2008.00287.x

Beatty, Anne, Chamberlain, Sandra and Magliolo, Joseph. 1996. An empirical analysis of the economic implications of fair value accounting for investment securities, Journal of Accounting and Economics, 22(1-3), pp. 43-77. https://doi.org/10.1016/S0165-4101(96)00429-6

Chiu, T., Lee, E., Walker, M., & Zeng, C. 2013. Does IFRS convergence affect financial reporting quality in China. ACCA research report, 131.

Cohen, D.A. 2003. Quality of financial reporting choice: Determinants and economic consequences. Working paper http://dx.doi.org/10.2139/ssrn.422581

Craswell, A.T., Francis, J.R. and Taylor, S.L. 1995. Auditor brand name reputations and industry specializations. Journal of Accounting and Economics, 20(3), pp.297-322. https://doi.org/10.1016/0165-4101(95)00403-3

Cuijpers, R., & Buijink, W. 2005. Voluntary adoption of non-local GAAP in the European Union: A study of determinants and consequences. European Accounting Review, 14(3), pp. 487−524. https://doi.org/10.1080/0963818042000337132

Daske, Holger and Gebhardt, Günther. 2006. International financial reporting standards and experts' perceptions of disclosure quality, Abacus, 42(3-4), pp. 461-498. https://doi.org/10.1111/j.1467-6281.2006.00211.x

DeAngelo, L.E. 1981. Auditor size and audit quality. Journal of Accounting and Economics, 3(3), pp. 183-199. https://doi.org/10.1016/0165-4101(81)90002-1

Dechow, P.M., Sloan, R.G. and Sweeney, A.P. 1995. Detecting earnings management. Accounting Review, pp.193-225. http://www.jstor.org/stable/248303

Deloitte, 2016. IAS Plus. From http://www.iasplus.com/en/resources/ifrs-topics/use-of-ifrs. Date accessed: 16 Apr 2019.

Dichev, I., Graham, J., Harvey, C.R. and Rajgopal, S. 2016. The misrepresentation of earnings. Financial Analysts Journal, 72(1), pp.22-35. https://doi.org/10.2469/faj.v72.n1.4

Dimitropoulos, P.E., Asteriou, D., Kousenidis, D. and Leventis, S. 2013. The impact of IFRS on accounting quality: Evidence from Greece. Advances in Accounting, 29(1), pp.108-123. https://doi.org/10.1016/j.adiac.2013.03.004

Dunn, K.A. and Mayhew, B.W. 2004. Audit firm industry specialization and client disclosure quality. Review of Accounting Studies, 9(1), pp.35-58. https://doi.org/10.1023

Enomoto, M., Kimura, F. and Yamaguchi, T. 2015. Accrual-based and real earnings management: An international comparison for investor protection. Journal of Contemporary Accounting & Economics, 11(3), pp.183-198. https://doi.org/10.1016/j.jcae.2015.07.001

Gerayli, M.S., Yanesari, A.M. and Ma'atoofi, A.R. 2011. Impact of audit quality on earnings management: evidence from Iran. International Research Journal of Finance and Economics, 66(1), pp.77-84. Retrieved from gorganiau.ac.ir/my_doc/gorgan/professor/m.maatoofi/IRJFE_66_07.pdf. Date accessed: 16 Apr 2019.

Halabi, H. and Yi, L. 2015. Mandatory IFRS adoption and earnings quality: The impact of country-specific factors. Dissertation of Faculty of Social Science Essex Business School. Retrieved from https://repository.hkbu.edu.hk/hkbu_staff_publication/4844. Date accessed: 16 Apr 2019.

Ismail, W., Anuar Kamarudin, K., Van Zijl, T., & Dunstan, K. 2013. Earnings quality and the adoption of IFRS-based accounting standards. Asian Review of Accounting, 21(1), pp. 53-73. https://doi.org/10.1108/13217341311316940

Jensen, M.C. and Meckling, W.H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), pp. 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Karamanou, I. and Nishiotis, G.P. 2009. Disclosure and the Cost of Capital: Evidence form the Market's Reaction to Firm Voluntary Adoption of IAS. Journal of Business Finance & Accounting, 36, pp. 793-821. https://doi.org/10.1111/j.1468-5957.2009.02154.x

Krishnan, G.V. 2003. Audit quality and the pricing of discretionary accruals. Auditing: A Journal of Practice & Theory, 22(1), pp.109-126. https://doi.org/10.2308/aud.2003.22.1.109

Narkunienė, J., Ulbinaitė, A. 2018. Comparative analysis of company performance evaluation methods. Entrepreneurship and Sustainability Issues, 6(1), pp. 125-138. http://doi.org/10.9770/jesi.2018.6.1(10)

Solikhah, B., Della Firmansyah, N. and Pirzada, K. 2017. Influence of effective BOC on choice of auditor, Pertanika Journal of Social Sciences & Humanities 26 (S) Nov. Retrieved from http://www.pertanika.upm.edu.my/Pertanika%20PAPERS/JSSH%20Vol.%2025%20(S)%20Nov.%202017/22%20JSSH(S)-0608-2017-6thProof.pdf. Date accessed: 16 Apr 2019.

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2019 Volume 7 Number 1 (September)
http://doi.org/10.9770/jesi.2019.7.1(9)

Pirzada, K. 2016. Providers and Users'perception of Voluntary Need of Human Resource Disclosure: A Content Analysis. Polish Journal of Management Studies, 14(2), pp. 232-242. Retrieved from https://ideas.repec.org/a/pcz/journl/v14y2016i1p232-242.html. Date accessed: 16 Apr 2019.

Reynolds, J. K., & Francis, J. R. 2000. Does size matter? The influence of large clients on office-level auditor reporting decisions. Journal of Accounting and Economics, 30(3), pp. 375-400. https://doi.org/10.1016/S0165-4101(01)00010-6

Zemguliene, J., Valukonis, M. 2018. Structured literature review on business process performance analysis and evaluation, Entrepreneurship and Sustainability Issues, 6(1), pp. 226-252. http://doi.org/10.9770/jesi.2018.6.1(15)

Wardhani, R., Utama, S. and Rossieta, H. 2015. The effect of governance system and degree of convergence to IFRS on the quality of financial reporting: Evidence from Asia. Corporate Ownership and Control, 12(4), pp. 409-423. https://doi.org/10.22495/cocv12i4c3p8

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THE RUBLE EXCHANGE RATE AND THE PRICE OF OIL: ASSESSMENT OF THE DEGREE OF DEPENDENCE, ITS CAUSES AND WAYS OF OVERCOMING

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Abstract. This article is an attempt to estimate the impact of the volatility of oil prices on the income of Russian economic entities associated with the oil realization, as well as the importance of the price of oil in stabilizing the exchange rate of the national currency. The authors have analyzed dependencies between the variance of the price of oil, ruble exchange rate against the US dollar and Russian oil export volume and observed the correlation between these indicators. It has been concluded that the problems of the Russian economy are expressed in the loss of dollar revenues from oil sales by 2.37 times in the last five years, which significantly affected the trade balance and served as the basis for the devaluation of the ruble. According to the results of the research, the authors suggest several solutions for raising the price of oil and stabilizing the ruble exchange rate.

Keywords: oil price; ruble rate; oil production volume; US dollar rate

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JEL Classification: F 37

1. Introduction

Currently, Russia is going through a crisis period. The low price of oil, the inaccessibility of borrowed capital due to sanctions on several industries, and the growth of costs for the military-industrial complex all combine to impede the development of the economy, increase consumer prices, and reduce the standard of living. However, in this situation, it is important to understand how certain factors affects the economy, to what extent, and for what reason they occur.

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Feklin and Shevelev (2015) concluded that the most significant factor affecting the ruble is the price of oil. This is due to the fact that Russia's monetary policy is largely determined by revenues from the export of oil and gas resources. At the same time, the price of oil is not the only factor that influences the dynamics of the ruble exchange rate. We will consider the effect of the "tax period". The need to make tax payments leads to an increase in the supply of currency from exporters and, as a consequence, to the strengthening of the ruble. Therefore, in the tax periods, there is a relative strengthening of the ruble. Similar conclusions were found in the article by Kiselitsa, Shilova and Liman (2017).

Dvorets and Shevelev (2015) confirmed that the dependence of the ruble exchange rate on the price of Brent crude oil exists and can be characterized as strong and linear. The researchers made this conclusion on the basis of the results obtained using the method of least squares. The price of Brent crude oil and the ruble exchange rate served as variables for this model. This topic was also researched by Liman (2015).

Dreger, Fidrmuc, Kholodilin and Ulbricht (2015) provide evidence on the driving forces of the ruble exchange rate. Their analysis is based on cointegrated VAR models, where fundamental long-run relationships are implicitly embedded. The results indicate that the bulk of the depreciation is caused by the decline of oil prices. In addition, unanticipated sanctions matter for the conditional volatility of the variables involved.

Wu (2017) believes that the depreciation of the ruble caused large-scale evaporation of Russia’s GDP, the decline in corporate competitiveness, and financial instability. While short-term remedy policies were implemented to control the situation, the inevitable economic losses and economic recession have already taken place. It takes a long time to reverse the situation and restore the economy. The similar conclusion was made by other researchers, such as Cheng (2015), Li (2015), and Li (2017).

Blokhina, Karpenko and Guirinskiy (2016) found that another important factor influencing the currency rate of the ruble is a change of key interest rate of the Russian Central Bank. The increase of key interest rate of the Central Bank or security yield in rubles will cause an increase in demand for Russian ruble and will lead to the strengthening of its currency rate. Rather higher key interest rate of the Central Bank will lead to inflow to Russia of the foreign equity, increase the offer of foreign currency and lead to a reduction in the cost of the dollar, causing the strengthening of the ruble. The basis of this research consists of the research by by Amano and Van Norden (1998).

The causes of the ruble fall were also the research topic of numerous works by Russia Studies (2011), Liman and Golubeva (2015), Wang (1993), Xie (2015), Xu (2004), Xu (2014), Yu (2013), Volkov (2013), and Chen (2007).

Gore and Turner (2016), as well as Sosunov and Ushakov (2009), studied the consequences of the sanctions. They admitted, that despite being barred from global capital markets, Russian banks such as Sberbank and VTB had seen a surge in corporate deposits as Russian companies fearful of an escalation in western financial sanctions repatriated cash piles held abroad. The dependence of Russia on foreign capital fell, which allowed reducing the national debt by more than 200 billion US dollars in the last two years. By the end of 2017, GDP growth was projected, which means the exit of the national economy from recession and ruble appreciation in the long term.

Of interest is the idea developed by Rudenko (2016). The results of the study of Russian corporate loan market showed that even some enterprises on the sanctions list, for example, Lukoil, gained the opportunity to borrow currency at lower interest rates than before the introduction of the sanctions regime. In even better conditions were those who did not enter this list: excessive currency liquidity hardened competition in the international credit market for Russian enterprises, favorably affecting the terms of issuing borrowings.

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However, not all researchers adhere to this line. Bykau (2016) and Cao (2014) believe that there is a problem of expensive loans for Russian companies because of the high volatility of ruble. Their research shows that flexible monetary policy of the Central Bank is a necessary but clearly not sufficient condition for overcoming the crisis and resuming the economic growth. This opinion was also supported by Kiselitsa and Shilova (2016).

This article discusses the impact of the volatility of oil prices on the income of economic entities associated with the sale of oil, as well as the importance of the price of oil for stabilizing the exchange rate of the national currency.

2. Materials and methods

The research is based on measuring the economic data and estimating the dependence and correlation between them. The following statistical data were used: oil price, currency exchange rates, budget deficit, oil realization earnings, oil export volumes, inflation level, and oil global production volume. The methodological basis of the research relates to such scientific methods of cognition as induction and deduction, analysis and synthesis, graphical method and systematic approach.

The paper analyzes the relationship between the change in the price of oil, ruble exchange rate against the US dollar and volume of Russian oil exports. The reasons for the low price of oil and the consequences for the economy of Russia are indicated. The search and analysis of the factors influencing the price of oil in the world market were carried out.

Moreover, some conclusions and explanations are based on the synthesis of other research containing findings concerning the influence of western sanctions against the Russian economy, the reasons for oil prices volatility and Russian economical expectations.

3. Results and discussion

In order to assess the degree of influence of oil prices on the ruble rate, it is necessary to determine how much they correlate with each other. To do this, we have constructed a graph (Figure 1), which reflects the price of one barrel of Brent crude oil in US dollars (Nefttrans.ru 2015; Database of the Central Bank of Russia 2017) and the price of 2000 rubles in US dollars.

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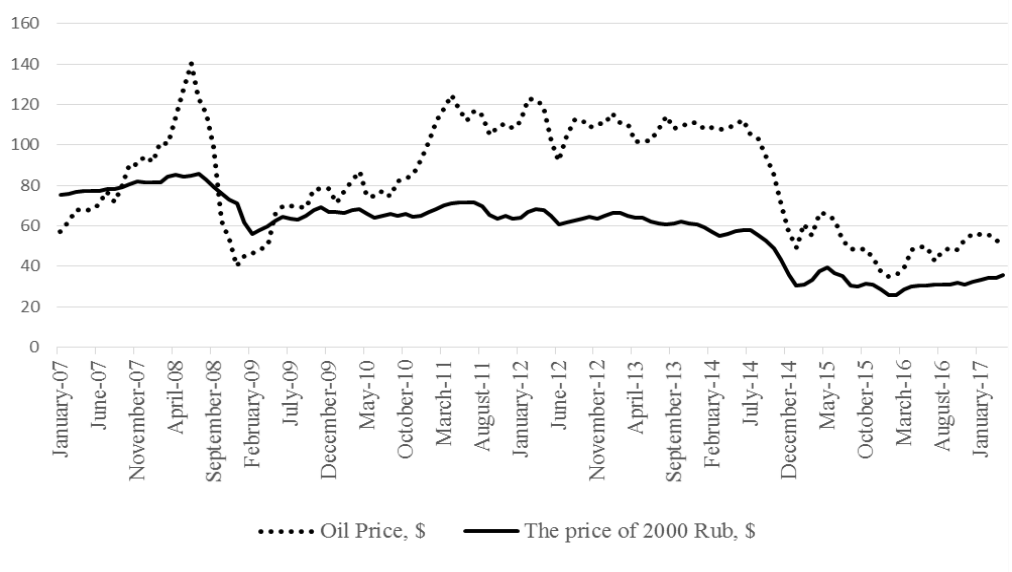

Fig.1. The comparison between the Brent oil price and the Russian ruble exchange rate against the US dollar

According to Figure 1, there is a close relationship between these two values (the correlation is 63.44%). During the periods of growth in the price of oil (January 2007 – May 2008, December 2008 – April 2011, January 2016 – January 2018), the ruble's price also increased, and in periods of a decline in oil prices (June 2008 – December 2008, June 2014 – January 2016), the price of the ruble also declined. It is worth noting that the rate of change in the price of the ruble is not so dramatic when compared with the change in the price of oil. It reacts more slowly than in the case of oil, but at the same time, the price movement is still rapid.

Thus, it should be concluded that the most important factor affecting the exchange rate of the Russian ruble is the price of Brent crude oil.

There are several reasons for the depreciation of the ruble connected with the fall in the price of oil. The first reason is the significant share of oil exports in the total exports of the Russian Federation. Annually, more than 50% of the country's foreign exchange earnings come from the sale of oil to other countries. The fall in the price of oil significantly reduces foreign exchange earnings. To maintain a positive trade balance, it is necessary to lower the exchange rate of the national currency. Such a decision will force residents of the country to make purchases of foreign goods and services valued at a smaller amount in foreign currency equivalents.

The second reason is the maintenance of an acceptable level of budget deficit. The dependence of the ruble and oil is not direct but is related to the dollar exchange. The essence of this dependence is that oil is sold for dollars, and the Russian budget should be filled and executed in rubles. Therefore, if the amount of dollars coming from the sale of oil is reduced, in order to "reduce" the budget, one needs to get more rubles, and this can only be done with the help of devaluation. The same rule also applies in the opposite direction: with the growth of the price of oil, the ruble strengthens. The Central Bank can influence the ruble exchange rate by changing the key rate, buying or selling foreign currency or using other instruments at its disposal.

Let us prove that this tendency really exists. This can be done by comparing the proceeds from the sale of oil in rubles (Finam 2017) and the state of the budget deficit (Lenta.ru 2015; 2017; Interfax 2016).

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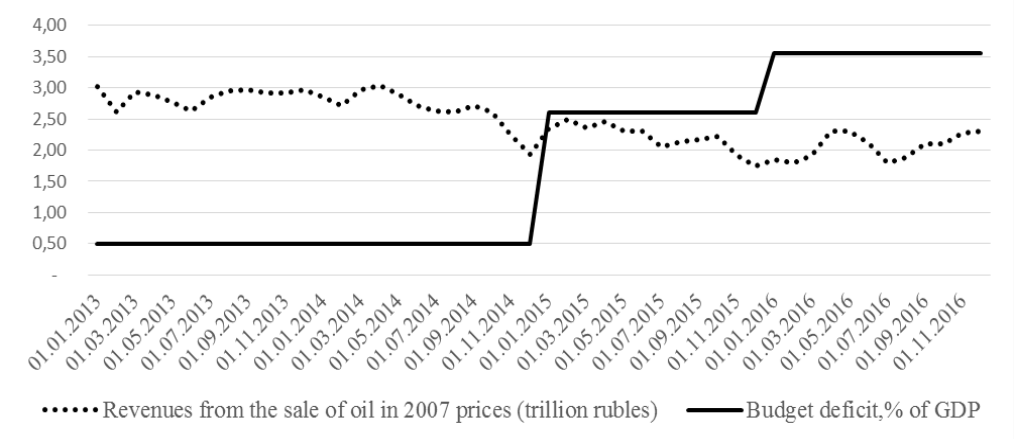

Fig.2. Comparison of revenues from oil sales and budget deficit

As can be seen in Figure 2, the drop in revenue from the sale of oil entailed an increase in the budget deficit. It can be concluded that with an average monthly revenue of 2.75 trillion rubles the budget deficit is minimal (0.5% of GDP), and the reduction in the average monthly revenue to 2 trillion rubles leads to an increase in the budget deficit to 2.5% of GDP in the short term and up to 3.5% of GDP in the medium term. When oil revenues started to grow in 2017, the budget deficit declined.

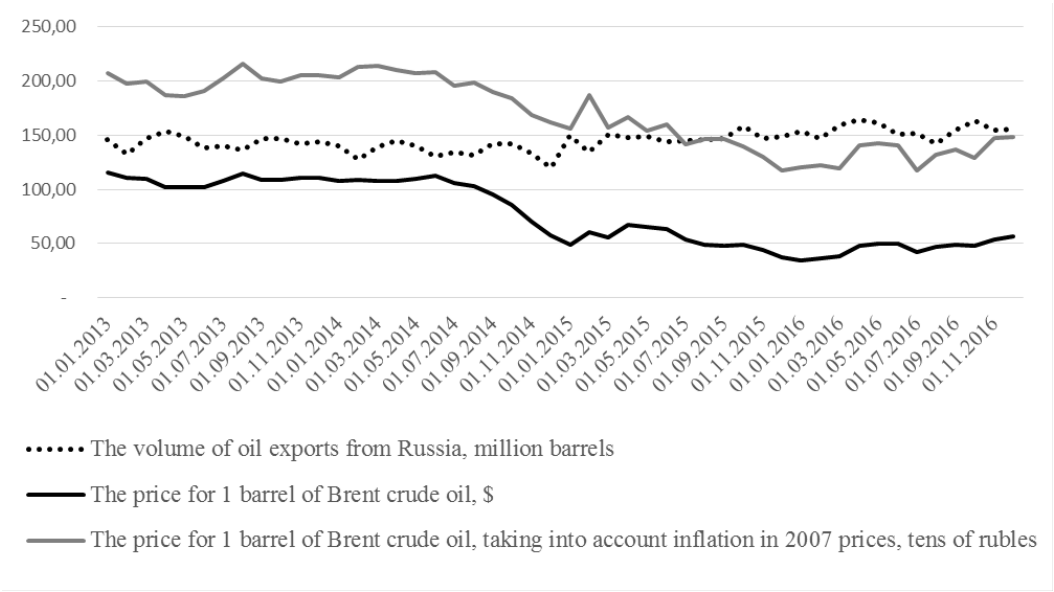

Fig.3. Change in the volume of oil exports depending on the current price of oil

From Figure 3, it can be concluded that the export volumes are inversely proportional to the price of oil: the cheaper the oil is, the more it needs to be extracted and sold in order to stabilize the size of the currency proceeds.

If a 1% drop in the price of oil entails a depreciation of the ruble by 1%, the country will receive less dollar revenue, but in rubles, the amount will not change compared to the previous period. Of course, in reality, the elasticity of the ruble's exchange rate to the price of oil may differ significantly from this assumption. To determine the ruble losses or the gain from the volatility of the ruble exchange rate and the volatility of the oil price, we will analyze the cash receipts in rubles from the sale of oil. To do this, the price of oil in US dollars

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must be multiplied by the ruble exchange rate and adjusted for inflation. The inflation adjustment is necessary in order to assess the significance of the revenues from the sale of oil in the country relative to the base period (Table 1).

Table 1. Calculation of the price of oil in rubles considering inflation

Year	Dollar exchange rate, rub.	Oil price, $ per barrel	The price index by January 1, 2007	The price of oil, considering inflation, rub.
2007	25.58	74.75	1.0000	1,912.21
2008	24.86	97.28	1.1256	2,148.25
2009	31.83	64.18	1.2759	1,601.01
2010	30.36	80.32	1.3782	1,769.58
2011	29.39	112.41	1.5099	2,188.21
2012	31.07	110.7	1.5728	2,186.97
2013	31.85	108.69	1.6841	2,055.6
2014	38.47	97.64	1.7859	2,103.11
2015	61.29	53.41	2.0533	1,594.26
2016	67.19	46.1	2.2538	1,374.4
2017	58.15	53.92	2.367	1,324.78

Graphically, we represented the calculated indicator in Figure 4.

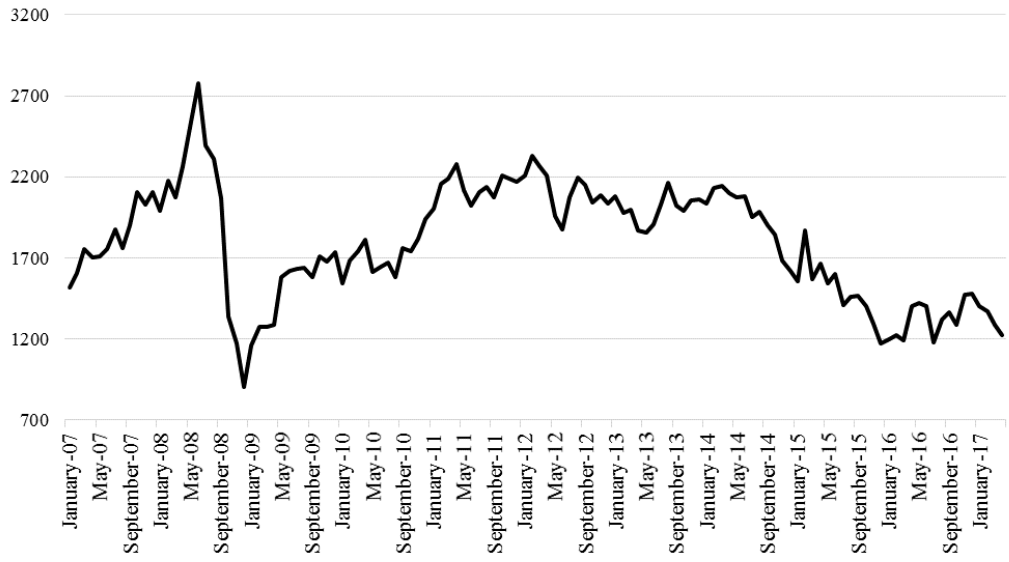

Fig.4. The price of oil in rubles adjusted for inflation

Figure 4 shows that the price of oil in rubles is significantly affected by volatility. At the same time, during the crisis (2008-2009, 2014-2017), the price of oil fell, and during the economic recovery (2007-2008, 2009-2012), it increased.

Since the outbreak of hostilities in Syria to the current time, ruble proceeds from the sale of oil have declined by 1.9 times per barrel. This means that there are still losses in the ruble equivalent, and they are quite substantial.

It should be noted that the decline in dollar revenue per barrel was 2.37 times, and the fall in the ruble exchange rate against the dollar for the period from January 2012 to April 2017 was 53%. These two factors had a

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significant impact on the change in the price of a barrel of oil in rubles. It turns out that the fall in the Russian national currency compensated for the decline in the price of oil only by 25%.

According to the data from the PROVED (2017), in 2016, fuel and energy products accounted for 58.44% of Russian exports. This means that, given the unchanged production volume, the country lost about 34% of its foreign exchange earnings from this.

It is worth noting that most experts identify several reasons for cheaper oil. They include the following:

- The strengthening of the dollar due to the end of the "quantitative easing" of the US Federal Reserve;
- Decreased energy demand due to the recession in Europe and reduced demand growth in Asian countries due to the introduction of less energy-intensive production technologies and stabilization of output;
- The absence of agreement between exporting countries to reduce production.

To prove the first point, we can appeal to the strengthening of the dollar estimated in relation to other world currencies, such as the euro, the Swiss franc, the Japanese yen and the Chinese yuan. In Figure 5, we demonstrate currency exchange rates paired with the dollar for the last five years.

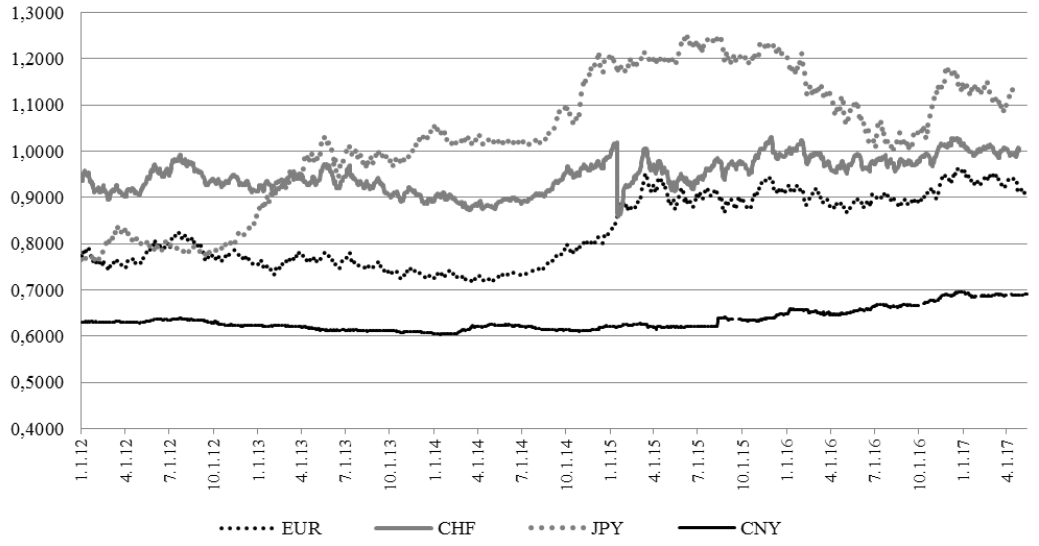

Fig.5. The ratio of the price of the dollar to the prices of other world currencies

As the graph shows, indeed, there is a tendency for the dollar to strengthen against other world currencies. In terms of the dollar's value in pairs with the euro, franc, yen and yuan, the fall in oil prices has been amplified by about 10%.

The price of oil decreases with the increase of supply. Since 2009, the volume of oil production has been steadily increasing (Malina Group 2017). This can be seen in Figure 6.

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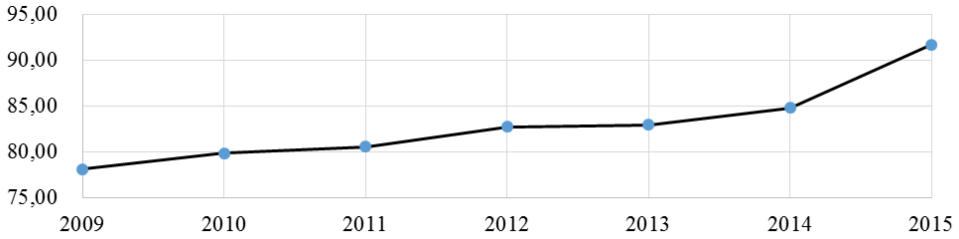

Fig.6. Growth in global oil production, million barrels per day

The decline in oil prices forces the oil-producing countries to increase production to stabilize their revenues. This is necessary to return money invested in the oil industry, and to ensure an acceptable standard of living in countries heavily dependent on oil sales in the foreign market. The increase in supply leads to a further reduction in the price.

Thus, to increase the volume of revenues from the sale of hydrocarbons, it is necessary to reduce the volume of oil production and its supply to the international market for all countries.

It should be noted that oil-producing countries have different prime costs of oil production. Therefore, according to experts, the cost of producing a barrel of oil on the Arabian Peninsula is about 5 US dollars, in Russia – 30-40 US dollars, in the US – 70 US dollars. To date, at a price of 50-55 US dollars per barrel, the production of shale oil in the States is unprofitable, so the supply volume from the US states is not so significant in comparison with what it would be if the price of oil were about $100-120 per barrel. If the price of oil exceeds $70, the countries that produce oil by the standard method will face a new competitor. In view of this, Saudi Arabia and OPEC countries are most likely to prevent oil appreciation of more than 20 US dollars in the short term.

For the Russian economy, the low price of oil leads to diverse consequences. Among them, there are many negative ones: a reduction in the number of goods that can be purchased for import due to a drop in export earnings, which leads to a decrease in the purchasing power of people and a weakening of the ability of companies to purchase equipment and other goods necessary for production. Positive effects from the fall in the price of oil and, as a consequence, the ruble depreciation, also exist: exporters receive foreign exchange earnings, and when converting them into rubles at a low rate, have more financial opportunities for purchasing goods and services in the domestic market, thus driving the domestic economy and stimulating it growth.

The depreciation of the ruble, as was mentioned earlier, occurred to a large extent due to the serious dependence of the Russian economy on the price of oil. It follows, that today the ruble exchange rate can return to the level of 2013 only under two circumstances: if oil prices return to a level close to $100 per barrel or the Russian economy is able to overcome raw material dependence and diversify its export supplies in order to obtain greater foreign exchange earnings.

The main factors influencing the supply and demand for oil are as follows:

1. The position of oil-exporting countries. OPEC, which controls most of the oil supply to the market, and which can reduce or increase the volume of oil production by changing quotas.

2. Political instability in oil-rich regions as a factor hampering the supply and transportation of energy.

3. Conditions hampering free trade: natural disasters, bad weather conditions, accidents on pipelines, etc.

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4. Information about world oil reserves. The more oil is found, the greater the volume of potential supply to the market is.

5. The general growth/deterioration of the world economy: the growth of world production requires an increase in the energy.

6. Scientific developments aimed at reducing global energy consumption, especially consumption of petroleum products.

From the aforesaid, it follows that Russia, as a player in the world oil exchange, does not have many ways of influencing the price of oil. This situation implies that only the second way remains a viable option for the Russian government, which involves the diversification of exports. Here too, there are two options for action:

1. The state as a whole encourages non-commodity exports through preferential taxation and discourages commodity exports by increasing export duties. However, this policy will, to a great extent, lead not to the creation of new high-tech industries in different sectors of the economy, but to the creation of oil refineries with the aim of supplying oil products to the foreign market that are not subject to high export duties. The downside of this solution is the problems created for the oil companies, which today are key in feeding the Russian economy.
2. Following from the experience of South Korea and Chile, the state finds several resident companies that are successfully trying to supply non-oil products for export and invites them to participate in a support program. Low tax and export rates and a low-interest rate to attract borrowed funds from state-owned banks under government guarantees will make it possible to build highly efficient competitive production in a short time and, possibly, to take a share of the market in foreign countries. A downside of such a policy is the difficulties associated with antitrust laws, which may result in issues regarding the unequal approach of the state to private companies in the market economy.

Since 2014, under the pressure of foreign sanctions, internal political decisions and common sense, the Government of the Russian Federation have been actively trying to implement a program for diversifying the domestic economy. However, at present the results are disappointing: the volume of raw material exports is growing every year. This is accompanied, primarily, by the fact that currently, the country needs money for its development, and the most effective way to earn it available to the Russian Government is the exportation of energy resources. The volume of oil production annually beats records, thereby increasing, albeit not significantly, the world oil supply. With the falling demand for this energy resource, the price of oil continues to remain at a low level, reducing currency earnings in the country, devaluing the ruble and stimulating price growth.

Conclusions

As a result of the study, we found that there is a strong correlation (86.44%) between the price of a Brent crude oil barrel and ruble exchange rate in US dollars. Moreover, every time when oil prices rise, there is an economic recovery in Russia and when the prices fall, there is an economic downturn.

The price of oil decreases with the increase in supply. An 18% growth of oil extracting caused the 17% recession of oil prices (2009-2015).

One of the reasons for oil price decline is the gain of the dollar. There is a tendency of strengthening the dollar against other world currencies. Over the past five years, just like the Euro, the Chinese Yuan, the Swiss Franc and the Japanese Yen, the dollar has become more expensive by about 10% amid falling oil prices.

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The problems of the Russian economy are expressed, among other things, in the loss of dollar revenues from oil sales by 2.37 times in the last five years, which significantly affected the trade balance and served as the basis for the devaluation of the ruble. Such a significant decline is ensured by the fall in the price of oil due to a decrease in demand, as well as the strengthening of the dollar against other world currencies. This state of macroeconomic factors led to an increase in the Russian budget deficit from 0.5% of GDP in 2013 to 3.5% in 2016.

In order to minimize the budget deficit and stabilize the economic situation, the Government of the Russian Federation regularly increases the export of raw materials in order to obtain greater foreign exchange earnings in the short term. However, the growth of the aggregate supply of oil in the market with falling demand is accompanied by a decrease in the price of energy resources, which leads to a fall in foreign exchange earnings and devaluation of the ruble. To somehow get out of the vicious circle, which began in 2014, under the pressure of foreign sanctions, domestic decisions and common sense, the Government of the Russian Federation has been actively trying to implement a program of diversifying the domestic economy. However, at the moment program hasn't managed to give the desired result: the budget deficit grows from year to year.

The government should pay more attention to supporting entrepreneurship in various spheres of the economy, especially those, in which Russia has competitive advantages over other exporters in the world market.

References

Amano, R. A.; Van Norden, S. 1998. Oil Prices and the Rise and Fall of The U.S. Real Exchange Rate, *Journal of International Money and Finance* 17(2): 299-316. https://doi.org/10.1016/S0261-5606(98)00004-7

Blokhina, T. K.; Karpenko, O. A.; Guirinskiy, A. V. 2016. The Relationship between Oil Prices and Exchange Rate in Russia, *International Journal of Energy Economics and Policy* 6(4): 721-726.

Bykau, A.; Ghodsi, A.; Nezhadhossein, H. 2016. Impact Of Oil Prices On Russian Ruble On Condition Of Floating Exchange Rate Regime, *The 5th international Virtual Scientific Conference on Informatics and Management Sciences*: March 21-25, Slovakia, 67-69. https://doi.org/10.18638/ictic.2016.5.1.274

Cao, Y. 2014. The Ruble Devaluation Caused the Russian People to Worry, *China Industry & Commence News*: 1.

Chen, S. S.; Chen, H. C. 2007. Oil prices and real exchange rates, *Energy Economics* 29: 390-404.

Cheng, Y. J. 2015. Impacts and Inspirations of the Ruble Crisis, *Academic Journal of Russia Studies* 2: 39-35.

Dreger, C.; Fidrmuc, J.; Kholodilin, K.; Ulbricht, D. 2015. *The Ruble between the Hammer and the Anvil: Oil Prices and Economic Sanctions.* Berlin: Deutsches Institut für Wirtschaftsforschung.

Dvorets, N. N.; Shevelev, A. Y. 2015. Modelling Ruble Exchange Rate Dependence from Dollar Oil Price, *International Journal of Applied and Fundamental Research* 6: 293-295.

Export Of Quotations. 2018, February 21. *FINAM*, Retrieved from https://www.finam.ru/profile/tovary/brent/export/.

Feklin, V. G.; Shevelev, A. Y. 2015. Modelling Of Dependence of Ruble Exchange Rate on the Price of Oil Taking Into Account Influence of the Tax Period, *Fundamental Research* 7: 433-435.

Foreign trade of Russia in 2016: figures and facts. 2017. *PROVED*. Retrieved from http://www.np-srv.ru/stati/vneshnyaya-torgovlya-rossii-v-2016-godu-cifry-i-fakty/

Gore, G.; Turner, M. 2015, November 20. Sanctions Fail to Stem Access to Finance for Russian Corporates. *Reuters*, Retrieved from https://www.reuters.com/article/russia-sanctions-banks/sanctions-fail-to-stem-access-to-finance-for-russian-corporates-idUSL8N13F1FC20151120

Grafik kotirovok nefti. 2015. *NEFTTRANS.RU*, Retrieved from http://www.nefttrans.ru/info/quotes/gr.php.

Kiselitsa, E. P.; Shilova, N. N. 2016. Economic technology of enterprise risk management based on information support for their activity, *Journal of Internet Banking and Commerce* 21(S3).

Kiselitsa, E. P.; Shilova, N. N.; Liman, I. A. 2017. Regional features of the innovative activity for-mation as a determining factor in the development of the Russian economy, *Academy of Strategic Management Journal* 16(1): 96-111.

Li, J. M. 2015. Causes and Impact of Russian Ruble Crash and Opportunities for Cooperation between China and Russian, *Comparative Economic & Social Systems* 1: 46-57.

Li, Z. H. 2011. Analysis of Ruble Internationalization Strategy and China-Russia Trade in Domestic Currency Settlement, *Russia Studies* 4: 92-104

Liman, I. 2015. Features of pricing in the Russian market of petroleum products. *RISC: resources, information, supply, competition* 4: 114-117.

Liman, I.; Golubeva, O. 2015. Causes of currency fluctuations and their impact on structural changes in the economy, *Economics and modern management: theory and practice* 41: 88-94.

Official Exchange Rate Dynamics O of a Given Currency. 2017. *Database of the Central Bank of Russia*. Retrieved from http://www.cbr.ru/currency_base/dynamics.aspx?VAL_NM_RQ=R01235&date_req1=23.12.2010&date_req2=1.01.2016&rt=1&mode=1

Rudenko, G. 2017. Russian Economy under the Conditions of Sanctions: What It Looks Like, *Effective Crisis Management*. http://www.info.e-c-m.ru/magazine/95/eau_95_431.htm

Russia Trade in Domestic Currency Settlement. 2011. *RUSSIA STUDIES*: 92-104.

Sosunov, K.; Ushakov, N. 2009. Determination of the Real Exchange Rate of Ruble and Assessment of Long-Run Policy of Real Exchange Rate Targeting, *Journal of the New Economic Association* 3-4: 97-121.

The Budget Deficit in Russia in 2016 Amounted To 3.5 Percent of GDP. 2017, 20 January. *Lenta.ru*, Retrieved from https://lenta.ru/news/2017/01/20/deficit/

The Budget Deficit in the Russian Federation in 2015 Amounted To 2.6% of GDP. 2016, 22 January. *INTERFAX*, Retrieved from http://www.interfax.ru/business/491040

The Ministry of Finance Named The Size Of The Budget Deficit In 2014. 2015, 21 January. *Lenta.ru*, Retrieved from https://lenta.ru/news/2015/01/21/budget/

The Volume of Oil Production by Countries of the World. 2018, February 24. *MALINA GROUP*, Retrieved from https://malina-group.com/marketingovye-issledovaniya-rynka/obem-dobychi-nefti-po-stranam-mira/

Volkov, I. I. 2013. The interaction of monetary and fiscal policy: theoretical and practical aspects, public finance, *Finance and credit* 27(555): 59-63. https://cyberleninka.ru/article/n/vzaimodeystvie-denezhno-kreditnoy-i-byudzhetnoy-politiki-teoreticheskie-i-prakticheskie-aspekty

Wang, B. Y. 1993. Why Did the Ruble Fall? *Eastern Europe and Central Asia Review* 5: 80-82.

Wu, M. 2017. The Impact of Russia's Oil-Dominated Energy Economic Changes on the Exchange Rate of Russian Ruble – Chinese Renminbi, *European Scientific Journal* 13(22): 173-191. http://dx.doi.org/10.19044/esj.2017.v13n22p173

Xie, L. F. 2015. An Analysis of the Reasons for the Devaluation of Russian Ruble and Its Enlightenment to China, *Siberia Studies* 3: 33-38.

Xu, P. L. 2014. The Crisis and Prospect of Russia's Economy, *Russia Studies* 2: 85-97.

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2019 Volume 7 Number 1 (September)
http://doi.org/10.9770/jesi.2019.7.1(10)

Xu, X. M. 2004. The Evolution of the Russian Exchange Rate System and the Development of the Foreign Exchange Market, *International Economic Review* 4: 48-52.

Yu, J. 2013. Research on the Impact of the Ruble Exchange Rate System over the Russian Economy. *Russia Studies* 6: 108-122.

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THE IMPACT OF ISLAMIC BANK FINANCING ON BUSINESS*

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Abstract. From the test results concluded that the Local Number Index (LNI) variable (business tendency index) affects Local Number Portability (LNP) variable (Islamic bank financing). The LNP variable (Islamic bank financing) does not affect this variable (business tendency index). So, there is one-way causality from the LNI (business tendency index) to LNP (Islamic bank financing). Other statistical test results showed that there is a long-term relationship between Islamic bank financing and business tendency. This is clarified by the results obtained from Johansen cointegration test. The result of cointegration test in this research is there is long-term relationship between syariah bank financing and business tendency. From the test results can be seen that the trace statistic is greater than the critical value of 5%. So in the long term, Islamic financing variables and business tendencies will affect each other. This shows that the financing of sharia banks whose allocation of financing is directed to the real sector, even forbidden to finance riba investments and speculation, will drive the business nationally, and vice versa, business that runs well and smoothly, will contribute to the development of Islamic banking performance.

Keywords: business tendency; conventional banks; Islamic banks; Islamic Bank financing; Johansen Cointegration test

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1. Introduction

Islamic bank is implemented as an intermediary institution that serves to connect between parties who have surplus funds with those who need funds, such as employers, government and household sector. The intermediary function undertaken here is expected to drive the real sector. A company needs efficient working capital to ensure that their company's operations run stable (Zariyawati et al. 2016; Hilkevics, Semakina 2019).

Banking activities in the real sector is to channel financing to the business sector. Islamic banks are more oriented on real sector compared to conventional banks. Financing distribution activities will increase the venture capital sector. Capital issues in Islamic economic perspective is very important. The capital is wealth that helps generate further wealth, encompassing everything that gives personal satisfaction, but also helps generate more wealth. Capital is wealth obtained by the results of his own and then used to produce more wealth.

Islamic Banking in its efforts to boost the real sector can be seen in the data published by Bank Indonesia through Islamic Banking Statistics data published every month. Financing provided by Islamic bank based on the type of contract is shown in Table 1. The data shows composition of financing channeled by Sharia Commercial Bank and Sharia Business Unit in 2010-2014, where the distribution of financing with *murabaha* scheme shows the highest number compared to other financing contracts. The dominance of financing is in the financing of *mudharaba*, *musharaka* and *murabaha*. The financing of *istisna*'a contracts which is channeled by sharia bank and sharia business unit in 2010 amounted to the lowest 347 billion rupiah. In contrast to *musharaka* and *mudharaba* financing, it turns out that from 2010 to 2014 has increased and ranks second and third after *murabaha* financing. This indicates that Islamic Bank in financing distribution is more directed at low-risk financing that is *murabaha*, and leads also to *musharaka* financing because there is sharing risk and return to the customer.

Table 1. Composition of Financing Giving Sharia Banks and Sharia Business Units in Indonesia 2011 – 2014 (Billion Rupiah)

Aqad	2010	2011	2012	2013	2014
Mudharaba	8,631	10.229	12,023	13,625	13,322
Musharaka	14,624	18,960	27,667	39,874	38,685
Murabaha	37,508	56,365	88,004	110,565	109,803
Salam	0	0	0	0	0
Istisna'a	347	326	376	582	547
Ijarah	2,341	3,839	7,345	10.481	10,451
Qardh	4,731	12,937	12,090	8,995	8,590
Others	0	0	0	0	0
Total	68,181	102,655	147,505	184,122	181,398

Source : Bank Indonesia Statistics Islamic Banking 2012

Islamic bank's concern for lower middle class society can be seen in the channeling of funds. Table 2 shows the role of Islamic banks in channeling the funds to small and medium enterprises (SMEs) who get serious attention from the government lately.

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Table 2. Islamic Financing and Commercial Bank of Islamic Business Unit in Indonesia Based on Financing Card 2007-2011 (Billion Rupiah)

Financing Group	2010	2011	2012	2013	2014
Small and Medium Enterprises	52,570	71,810	90,860	110,086	108,138
In addition to Small and Medium Enterprises*	15,611	30,845	56,645	74,034	73,260
Total	68,181	102,655	147,505	184,120	181,398

* Financing on large enterprises

Source : Bank Indonesia Statistics Islamic Banking 2012

Based on the table, it appears that in 2010 the amount of financing provided 52,57 billions rupiah, and it turns out in 2011 to 71,81 billions rupiah. The growth shows the SMEs financing channeled by the Islamic banking is more directed to SMEs. So it appears that Islamic banks are more direct financing for SMEs. Small and Medium Enterprises are business actors that dominate the Indonesian economy, this is evidenced by its contribution in the Gross Domestic Product (GDP) of about 54.34% and in absorbing labor about 97% (Statistics of Islamic Banking, 2016). This condition directly demonstrates the sharia bank's alignment to SMEs and this is in accordance with the Islamic economic mission to combat poverty, as evidenced by the stronger resilience of SMEs in facing the economic crisis than the big industry.

SMEs financing that has doubled over non-SME financing shows Bank Islam's commitment in providing financing to the small business sector. Islamic banking in addition to still pay attention to profit but must pay attention to aspects of benefits for the ummah. So, by channeling any financing type of contract to the SMEs sector is a form of commitment of Sharia Bank which must always be done consistently in moving the real sector in performing its function as an intermediary institution of sharia.

Small and Medium Enterprises is an essential sector for the national economy. This effort is one kind of effort that is easy to be done by the people, and the majority is driven in the family business, thus the SMEs of an undesirable economic potential part to be ignored. Especially when viewed from contribution in absorption of labor, the SMEs can be relied upon. Data Badan Pusat Statistik (2013) on Survey Report of Value Added Development of SMEs in 2007-2012 shows that the number of workers absorbed by SMEs in 2007 of 90,491,930 people increased to 107,657,509 in 2012.

Business Tendency Index (BTI) is an indicator of economic development efforts that the data obtained from the latest Business Tendency Survey (BTS) conducted by the Central Bureau of Statistics in collaboration with the Business Tendency Indonesia. Indeks Bank (IB) in the fourth quarter 2016 amounted to 106.70, means that business conditions improved from the previous quarter. But the level of business optimism is lower when compared to the third quarter of 2016 (BTI value of 107.89). Islamic bank financing is one of the important elements that support the running and running of business. Therefore, this study examines : Is Islamic banking financing affect the business tendency? Is the business tendency affect the Islamic bank financing?, Are there two mutually influential relationships between Sharia Bank financing and business tendencies? Is there a long-term relationship between Sharia Bank financing and business tendency? What is the impact of sharia bank financing on business tendencies in Islamic economic reviews?.

2. Literature Review

In terms of financing, Islamic banks are different from conventional banks, Islamic banks are more oriented to the real sector compared with conventional banks. It can be traced from the prolonged economic crisis, in which one of the reasons was the collapse of conventional banks experienced due to the negative spread. Negative spread is a condition in which the interest cost to be paid by the bank to depositors is greater than the interest income to be

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received by the bank. This happens because the bank is still obliged to pay interest to the depositors even though the business financed suffered a loss. This obligation is common in banking with interest systems.

The obligation to pay interest to the depositors, and achieve interest spreads, the banks tend to choose to give credit to businesses that have little risk or no risk at all. Consequently, some conventional banks focus more on playing on the money market by lending money to other banks or placing it at Indonesia with the lowest standard of interest, namely Certivicate of Bank Indonesia. This activity has almost no risk.

So the bank will channel funds to the real sector if the rate of profit exceeds the Certivicate Bank Indonesia rate, and even then added a certain risk premium. The higher Certivicate Bank Indonesia interest rate the higher lending rate for the real sector. Meanwhile for the real sector, high interest rates make the business climate difficult because it has to provide funds to pay interest to the bank, even in a loss condition. Finally with the interest system, the real losses of the real sector could be destroyed. So the bank with the interest system will have a negative impact on the economy. Basically the negative impact of the interest system is not directly felt individually in the near future, but the negative impact of the new bank interest is felt on a gradual level of macro, then suddenly economic shocks with a large degree of damage and difficult to cure. Thus, the financing of Islamic banks without interest is oriented to the real sector, so that the economy is healthier and more stable.

Financing with profit-sharing system works to increase economic expansion (Ryandono, 2009). Increased profit sharing means increased profits earned by the company. An increased profit means that the income of the entrepreneur increases. If this happens in aggregate, rising incomes will boost the economy of expansion, in the form of rising investment, production, supply demand, and falling unemployment. More implicitly the financing function of Islamic Bank is as follows (Ryandono, 2009).

1. Increase savings and financing
   The paradigm for customers both depositors and financiers at Islamic Bank is the investment paradigm, so that there is a positive relationship between income and risk levels and future results, which can be positive or negative. Increased profit sharing or investment returns will lead to increased supply and investment demand (savings and financing), and conversely, the declining returns or returns will lower demand and supply of investment (savings and financing).
2. Stabilizing prices
   Financing with profit-sharing system, the amount of profit share is not defined and not known in advance, which is set in advance is ratio.Lesar small payments for new results can be determined and determined by the income derived (based of income), so the profit sharing is not an expense capital. This has implications for the results will not affect the cost of production and selling price.
3. Does not cause inflation
   The above has been explained that the revenue share does not affect the price. Thus it can be said that profit sharing does not cause inflation.
4. Not causing an increase in the money supply
   In relation to the money supply, profit sharing is not an inflatoir in the economy and the money supply is only a representation of the real sector in the economy.
5. Positive impact on economic growth
   Profit sharing is an indicator of economic growth, and positively affects economic growth. If the revenue share increases, then economic growth will also increase, and vice versa.

The need for financing is essential for the business world. In maintaining the continuity of a business ranging from the purchase of raw materials, production processes, to marketing requires financing funds that are always readily available. In general, the business sector states the need for financing funds can reach two or three times the initial cost of production because after the product is thrown into the market, uncertain sales funds can be

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directly accepted by the business. Proceeds from long-term product sales at the supplier or distributor. Depending on the precipitation time varies one month, three months or more.

The condition is certainly very disturbing corporate cash flow. Thus the financing disbursed by an Islamic bank that is not determined by interest, but with a profit-sharing system, is very helpful to entrepreneurs in maintaining the continuity of their business. According to the majority of entrepreneurs, the burden of Islamic Bank financing installments that use the profit-sharing system is lower or cheaper than conventional banks that impose the interest rate system, although the difference in interest from Conventional Banks is not too much compared to the margin of Islamic Bank.

3. Method

The approach used in this research is descriptive quantitative research. Descriptive quantitative research is a problem related to the question of the existence of independent variables, either on one or more variables (Anshori, Iswati 2009). Quantitative approach is done by using econometric model.

The purpose of the method of quantitative research is to show the influence between variables, seeking theory, looking for generalizations that have predictive value (Sugiyono 2012). Quantitative approach using econometric analysis method combined mathematical analysis, economic theory and statistics.

The research variables can be interpreted as temporary answers to the research problem, the truth should be tested empirically. The hypothesis is to describe the relationship between two variables, namely causal and variable variables, and there is a comparison of one variable from two samples (Anshori, Iswati 2009). Variable research is an object selected by researchers to study and draw conclusions from the variables studied (Sugiyono 2012). Variables used in this research are as follows:

1. Independent variables are variables that influence or variable causes (Anshori, Iswati 2009). The independent variables in this research are Bank Syariah financing which consists of *mudharaba*, *musharaka* and *murabaha* financing.
2. Dependent variable is not dependent or dependent variable. These variables are referred to as output variables, criteria, consequent (Anshori, Iswati 2009). In this research the dependent variable used is business tendency.

Operational research may take the form of a measured operational definition, or an experimental operational definition. The operational definition measured gives an idea of how the variables or constructs are measured (Anshori, Iswati 2009). The research variables are basically anything in the form of what is determined by the researcher to be studied, so obtained information about it, and then drawn the conclusion (Anshori, Iswati 2009). So in this study operational variables used by researchers are:

1. Bank Syariah Financing (X)
   Bank Syariah financing here is Bank Syariah financing consisting of *mudharaba*, *musharaka*, and *murabaha* financing. Data for Bank Syariah financing consisting of *mudharaba*, *musharaka* and *murabaha* financing, obtained from statistics of sharia banking in the form of quarterly data in the period 2011-2014.
2. Business Tendency (Y)
   In general, this measure is often used as a measure to see or assess the business trends nationally, especially for medium and large businesses, the indexes that describe business and economic conditions in the current quarter and forecasts for the coming quarter. Data on business tendencies used from the Central Bureau of Statistics Indonesia that occurred in Indonesia within the period 2011 to 2014.

The type of data used in this study is the secondary data ratio of time series data (time series) which is a collection of observations within a certain time range. The quarterly time series data used from 2011 to 2014 to the third quarter. Secondary data is data taken directly from the official website of BPS and BI.

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The data source used is obtained from BPS and BI which is the population of this research. Data collection is done by documentary method. This method is a way of collecting data with materials or data material that become source, both derived from result of calculation done by official institution that is BPS and BI. Data that has been collected through access at www.bps.go.id and www.bi.go.id then the data will be processed by the author tabulation and will be examined both qualitatively and quantitatively.

1. Secondary data
   Secondary data is data obtained from other party, that is data already available and will be used by researcher. These data include :
   a. The report data for independent variables are Bank Syariah financing and business tendency obtained from BPS Social and Economic Statistics and Bank Syariah banking statistics.
   b. Data on existing business tendencies in Indonesia that can be accessed through www.bps.go.id.

2. Library Studies (library Research)
   Is a data collection technique equipped with reading and studying and analyzing the literature sourced from books and journals that berkatan with research. This is to get the foundation of theories and concepts that are composed. In this case the researcher uses the books and citing journals and takes the appropriate materials to the research.

Model Vector Auto Regression (VAR), is a development of the ADL model. The VAR method was first discovered by Sims (1980). The VAR model is built to overcome where relationships between economic variables can remain unpredictable without the need to emphasize exogenous problems. In this approach all variables are considered endogenous and estimates can be performed simultaneously and sequentially.
The VAR model will be combined with the Vector Error Correction Model (VECM) method of error correction, in addition to using VECM analysis method, it will also use impulse response function and variance decomposition analysis. Like the analysis conducted by Ascarya (2004) (Figure 1).

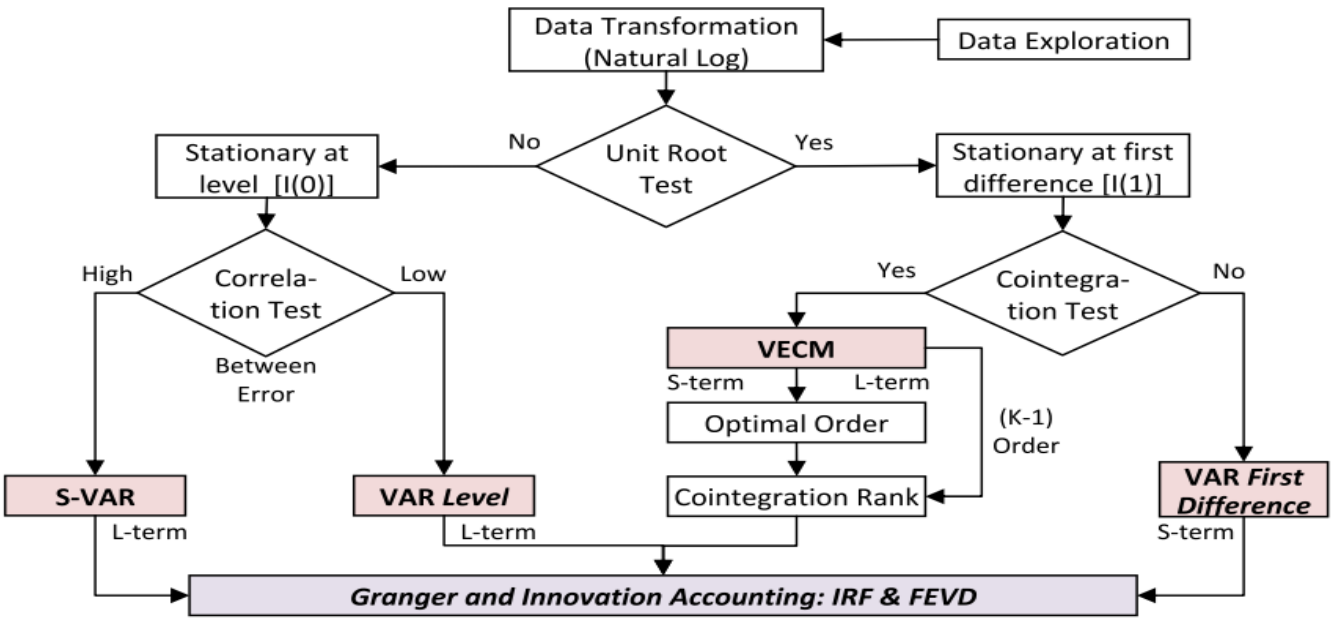

Figure 1. VAR and VECM Analysis Model**.** *Source*: (Ascarya 2004)

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The VECM model was first popularized by Eangle and Granger (1987) to correct short-term disequilibrium against the long term. This method is used in non structural VAR model when time series data is not stasioer at level level, but cointegrated. The presence of cointegration in the VECM model makes VECM the so-called VAR of the ter-ruction. VECM is a model of econometric analysis that can be used to determine the short-term behavior of a variable over its long-term due to the permanent shock.

VECM is an analytical model used to determine the short-term behavior of a variable over its long-term due to permanent shock. VECM analysis can also be used to find solutions to the problem of non-stationary non-stationary time variables and spurious regression in econometric analysis. VECM is used to view a cointegrated data and can see the effects that will appear in the long run and also provide an explanation of data that has no correlation but cointegration.

According to (Gujarati, Dawn 2003) the advantage of using the VECM model equation, namely:
1. Being able to see more variables in analyzing short-term and long-term economic phenomena.
2. Able to assess the consistency of empirical models with econometric theory.

Able to solve the problem of non stationary timeseries variable and direct regression in econometric analysis. This research is used to find out how effective conventional and sharia monetary operation variables influence economic growth in Indonesia. The steps of data analysis conducted in this research are:
1. Determining the variables studied are the variables studied are *mudharaba*, *musharaka*, *murabaha* and business tendency.
2. Determine the data used that is quarter I-IV 2011 to 2014.

The method of testing in this analysis is to use several stages in hypothesis testing, so that will be given a clear picture of the results of testing.
1. Stationary Test
   This stationary test uses Augmented Dickey Fuller (ADF) test using a five percent real level. If the result of t-ADF is smaller than the critical value of MacKinnon, it can be concluded that the data used is stationary (not containing the root of the unit). Through the first difference test all variables will be stationary data if data is found not stationary. Stationary data have a tendency to approach its average value and fluctuate around its average value (Gujarati, Dawn 2003).

The equation of stationary test with ADF analysis in the following equation:

$$\Delta F_t = \alpha_0 + \gamma F_{t-1} + \sum_{i=1}^{p} + \Delta F_{t-1+1}\varepsilon_t \dots\dots\dots\dots\dots\dots\dots \quad \textbf{(1)}$$

Where :
ΔF_t = **first difference form**
α_0 = **Intersep**
γ = **variable tested stationarity**
P = **length of lag used**
ε_t = ***error term***

In the equation it is known that the null hypothesis (H_0) denotes the root unit and the hypothesis one (H_1) denotes no root unit. If in this stasionerity test the ADFstatistik value is greater than the Mackinnon critical value, it can

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be seen that the data is stationary because it does not contain the root unit. Conversely, if the value of ADF statistics is smaller than Mackinnon Critical value, it can be seen that the data is not stastioner at the level of level. Thus, an ADF test must be performed in the form of first difference to obtain stationary data of the same degree.

2. Optimum Lag Selection
   Optimal lag selection is used to remove autologeration in VAR system. In this study used in optimal lag optimizer is using test. If the lag used in the stationary test is too small, the residuals of the regression will not show the white noise process so the model can not accurately estimate the actual error. As a result γ and standard errors are not well estimated.
   However, if too many lags can reduce the ability to process H0 because of too many parameters. The optimum lag determination can be done by looking at the information criteria recommended by Final Prediction Error (EPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn (HQ), some of the above criteria use residual sum of square (RSS) weighted. If there is an asterisk in the lag recommended by the above criteria, then it shows the optimal lag. Kritera with FPE or the smallest number of AIC, SIC, and HQ is the lag used.

   Akaike Information Criterion (AIC) : $-2\frac{1}{T} + 2(k+T) \ldots\ldots\ldots\ldots$ (2)

   Schwarz Information Criterion (SIC) : $-2\frac{1}{T}\, k \frac{\log(T)}{T} \ldots\ldots\ldots\ldots\ldots\ldots$ (3)

   Hannan-Quinn (HQ) : $-2\frac{1}{T} + 2k\log(\frac{\log(T)}{T}) \ldots\ldots$ (4)

   Where :
   1 = number of observations
   K = parameters to be estimated

3. Cointegration Test (Johansen's Cointegration Test)
   The cointegration test is used to see the long-term balance among the observed variables. Widarjono (2007) explains that one approach that can be used in cointegration test is by Johansen's Multivariate Cointegration Test method. The test developed by Johansen can be used to determine the cointegration of a number of vaiabel (vectors). This residual testing procedure is similar to stastionerity testing. To determine whether the data is cointegrated or not, it can be seen by comparing the Max-Eigen value and its trace value. If the Max-Eigen value and its trace value are greater than the critical values of 1% and 5%, then the data is cointegrated and has a long-term relationship.

4. *Vector Error Correction Model* (VECM)
   VECM is a test form that is executed when the VAR test shows cointegration. After the discovery of cointegration, the VECM test was performed. This test is a model used to correct the regression equation or variables indivinally un stationary back to its equilibrium value in the long run. In using VECM model then through impulse response function and variance decomposition to know short-term behavior of a variable to its long-term value. According to Ascarya (2010) that in general VECM can be formulated in the following equation:

$$\begin{pmatrix}\Delta y_{1t}\\ \Delta y_{2t}\\ \Delta x_{1t}\\ \Delta x_{2t}\end{pmatrix} = r\begin{pmatrix}\Delta y_{1-1}\\ \Delta y_{2t-1}\\ \Delta X_{1t-1}\\ \Delta X_{2t-1}\end{pmatrix} + \begin{pmatrix}\alpha_{1t}\\ \alpha_{2t}\\ \alpha_{31}\\ \alpha_{41}\end{pmatrix} x\,[\beta_{11}\beta_{21}\beta_{31}\beta_{41}]x\begin{pmatrix}y_{1t-1}\\ y_{2t-1}\\ x_{1t-1}\\ x2t-1\end{pmatrix} \ldots\ldots\ldots\ldots \quad (5)$$

Short-term Long-term

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5. Impulse Response Function
   The coefficients on the VECM equations are difficult to interpret so that impulse responses are used to interpret the VECM model equations. The impluse response function describes the rate of shock from one variable to another variable over a certain time span, so it can be seen how long the effect of a variable's shock on another variable until the effect is lost or returns to the equilibrium point. Impulse response in this research is focused to find out varibabel response of Syariah bank financing as well as business tendency variables.

6. Variance Decompositions
   Variance Decompotition or also called forecast error variance decompotition is a device in the VECM model that will separate the variation of a number of variables that are estimated to be shock components or to be innovation variables, assuming that the innovation variables are not mutually correlated. Then the decompotition variance will provide information on the proportion of the movement of the effect of shock on a variable to the shock of another variable in the current period and the period to come.

4. Results

By using VAR, variance decomposition and impulse-response function are generated to further assess the interaction relationship between variables, especially shariah bank financing proxy and business tendency. The results of this study test, examines the relationship between causalitas Islamic Banking Financing and Business Tendency Index in Indonesia. The results obtained from this research are (Table 3):

Table 3. Result of Causality Test between Sharia Bank Financing and Business Tendency

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
lni	lnp	9.3227	2	0.009
lni	ALL	9.3227	2	0.009
lnp	lni	.68212	2	0.711
lnp	ALL	.68212	2	0.711

Source: Data Processed

From the test results above can be concluded that:
1. The LNI variable (business tendency index) affects the LNP variable (sharia bank financing).
2. Variables LNP (Islamic bank financing) does not affect other variables (business tendency index).

So, there is one-way causality from this (business tendency index) to the lnp (sharia bank financing). This indicates that the increased business tendency will affect the performance of Islamic banks, because with conducive business conditions, will improve the economy, will affect the public's ability to save and make requests for funds to banks, including sharia banks. Meanwhile, the contribution of sharia banks is relatively small to the economy, which is about 5-6%, then the small change in the Islamic banking does not impact on business performance.

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The results of subsequent statistical tests show that there is a long-term relationship between sharia bank financing and business tendency. this is clarified by the results obtained from the Johansen cointegration test. The result of cointegration test in this research is there is long-term relationship between syariah bank financing and business tendency. The result of cointegration test in this research is shown by Table 4.

Table 4. Long Term Test Results between Sharia Bank Financing and Business Tendency

Johansen tests for cointegration

Trend: constant — Number of obs = 35
Sample: 2008q2 - 2016q4 — Lags = 1

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	2	56.946376	.	35.5866	15.41
1	5	73.160627	0.60407	3.1581*	3.76
2	6	74.739682	0.08628		

From the results above can be seen that the trace statistic is greater than the critical value of 5%. So in the long term, Islamic financing variables and binary temdensi will affect each other. This shows that the financing of sharia banks whose allocation of financing is directed to the real sector, even forbidden to finance riba investment and speculation, will drive the business nationally, and vice versa, business that runs well and smoothly, will contribute to the development of Islamic banking performance.

5. Discussion

Research conducted (Loong et al. 2017), shows that sharia banks as interest-free banks, the financing is directed to the real sector, and is not allowed for investments that contain elements of interest and speculation. Similarly (Laila, Widihadnanto 2017; Laila et al., 2019) states that established syariah banking industry significantly contributes to the economy. The results of this study generally show, in the long run, the financing of sharia banks that are represented through *mudaraba, musharaka* and *murabaha* positively and significantly related to business tendency in Indonesia. This shows empirically that the existence of Islamic bank financing is not only theoretically and ideologically able to derogify the activities of the economy of a country, but this theory can be proven empirically within the scope of banking and economic sectors in Indonesia. The results of this study are also supported by findings (Hesham, McCoy 2014) which states the importance of the Islamic banking industry in driving the economy. Similarly (Sulayman 2015) states that the establishment of sharia financial activities has created new investment opportunities and encourages people to do business.

The absence of interest rates combined with the existence of other Islamic financial instruments such as zakat, Chapra argue that sharia economy can minimize speculative demand money and make the total demand for money in the economy become more stable (Chapra 2001). Similarly, (Herianingrum, Syapriatama 2016) stated that the IRF results explain that the interest rate channel has difficulties to achieve the macroeconomic targets while Islamic monetary instruments indicate the potential for output growth and curb inflation.

Through the results of this study also, Islamic bank financing has effectively played its role as an Islamic financial institution that facilitates the mobilization of business activities. Therefore, it can be said that government policy

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to develop sharia banking in Indonesia is considered effective during the development of sharia banking sector and business growth are strongly interconnected. This study also indicates that the increase in Islamic bank financing in Indonesia will provide benefits to economic development or business and this is important in the long term for the development of the welfare of the community. This finding is supported by research results which states drive the business sector will drive the economy and will affect the welfare of the community (Kayed, 2011).

Conclusions

The results of this study indicate that there is a long term relationship between Bank Syariah financing with business tendency. This shows that although the contribution of Bank Syariah to the national economy is relatively small and the test results show no effect on business tendency, the characteristics of syariah bank as interestless bank, using profit sharing system, plus also other caracteristic that does not permit to invest in speculation and system interest, the sharia bank will have a significant positive impact on the business tendency or the real sector. The findings of this research are among others that business tendency influences on syariah banks, and supported by other research results, which states the importance of the development of sharia banks because their characteristics are different from conventional banks, it is necessary to support its existence as it is proven to be able to move the real sector in various business lines.

References

Anshori, M. and Iswati, S. 2009. *Metodologi penelitian kuantitatif.* Surabaya, Indonesia: Pusat Penerbitan dan Percetakan UNAIR, p. 245.

Ascarya, A. 2004. *Identifikasi Masalah Rendahnya Pembiayaan Bagi Hasil,* Pusat Studi dan Pendidikan Kebangsentralan BI, Jakarta, p. 432.

Bank Indonesia. 2012. *Statistik Perbankan Syariah Indonesia*. Direktorat Perbankan Syariah Bank Indonesia, Jakarta. https://www.bi.go.id/id/E404.aspx?RequestedUrl=https://www.bi.go.id:443/id/statistik/perbankan/syariah

Chapra, M.U. 2001. Masa depan ilmu ekonomi: sebuah tinjauan Islam. Gema Insani, p. 264.

Gujarati, D. N. and Dawn, C. P. 2003. *Dasar-dasar Ekonometrika*, Mc. Graw-Hill, New York, p. 569.

Herianingrum, S. and Syapriatama, I. 2016. Dual Monetary System and Macroeconomic Performance in Indonesia. *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah*, 8(1), pp.65-80. http://journal.uinjkt.ac.id/index.php/iqtishad/article/view/2509

Kayed, R.N. and Kabir Hassan, M. 2011. Saudi Arabia's economic development: entrepreneurship as a strategy. *International Journal of Islamic and Middle Eastern Finance and Management*, 4(1), pp.52-73. https://doi.org/10.1108/17538391111122203

Laila, N., Saraswati, K.A., Kholidah, H. 2019. Efficient portofolio composition of Indonesian Islamic bank financing. *Entrepreneurship and Sustainability Issues*, 7(1), 34-43. http://doi.org/10.9770/jesi.2019.7.1(3)

Laila, N. and Widihadnanto, F. 2017. Financial Distress Prediction Using Bankometer Model on Islamic and Conventional Banks: Evidence from Indonesia. *International Journal of Economics and Management (IJEM)*, 11(S1), pp.169-181. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=2ahUKEwiqn5yxkLThAhUG8HMBHbtICikQFjADegQIAxAC&url=http%3A%2F%2Fwww.ijem.upm.edu.my%2Fvol11_noS1%2F13).%2520IJEM%252011(S1)2017%2520-%2520Nisful%2520Laila%2520(Financial%2520Distress...).pdf&usg=AOvVaw12d_y49nRz2vsi4Sef3mfa

Loong, F., Kamarudin, F., Sufian, F. and Naseem, N.A.M. 2017. Estimating Efficiency in Domestic and Foreign Islamic Banking and Its Determinants among Three Neighboring Countries-Malaysia, Indonesia and Brunei. *International Journal of Economics & Management*, 11(1). http://psasir.upm.edu.my/id/eprint/56377/

Hesham, M.H.A. and McCoy, M.P. 2014. Islamic finance development in the sultanate of Oman: Barriers and recommendations. *Procedia Economics and Finance.* 15, pp.1619-1631. https://doi.org/10.1016/S2212-5671(14)00633-9

Hilkevics, S., Semakina, V. 2019. The classification and comparison of business ratios analysis methods. *Insights into Regional Development*, 1(1), 48-57. https://doi.org/10.9770/ird.2019.1.1(4)

Ryandono, H. M. N. 2009. *Benarkah Bunga Haram?,* Amanah Pustaka, Surabaya, p. 567.

Statistik Perbankan Syariah Indonesia. Direktorat Perbankan Syariah Bank Indonesia, Jakarta. https://www.bi.go.id/id/E404.aspx?RequestedUrl=https://www.bi.go.id:443/id/statistik/perbankan/syariah

Sugiyono. 2012. *Memahami Penelitian Kualitatif*, Alfabeta, Bandung, p. 356.

Sulayman, H.I, 2015. Growth and sustainability of Islamic finance practice in the financial system of Tanzania: Challenges and prospects. *Procedia Economics and Finance*, 31, pp.361-366. https://doi.org/10.1016/S2212-5671(15)01210-1

Widarjono, A. 2007. *Ekonometrika Teori dan Aplikasi*, Ekonisia FE UII, Yogyakarta, p. 325.

Zariyawati, M., Annuar, M. And Pui-San, N. 2016. Working Capital Management Determinants of Small and Large Firms in Malaysia. *International Journal of Economics & Management*, 10(2). http://www.ijem.upm.edu.my/vol10no2/(9)-VOL_10(2)2016_Zariyawati_Working%20Capital%20Management.....pdf

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UNIVERSITY GRADUATES, KNOWLEDGE SPILL-OVERS AND LOCALIZATION OF KNOWLEDGE INTENSIVE VENTURES - CASE OF POST-SOCIALISTIC COUNTRY *

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Abstract. This paper investigates how universities affect formation of new knowledge intensive ventures in conditions of post-socialistic country of Eastern Europe, depending on character of university spill-overs. Using tools of spatial econometry, we investigate how graduates rollout by universities and knowledge spill-overs on basis of interpersonal relationships between entrepreneurs and senior academic researchers determines emergence of knowledge intensive ventures in Slovakia, while we distinguish between total number of knowledge intensive firms (KIF), knowledge intensive manufacturing ventures (KIM), knowledge intensive business services (KIBS) and knowledge intensive services (KIS). Our estimates of spatial Durbin models indicate that even in conditions of country that lacks universities carrying out top-excellent research, university spill-overs affects formation of knowledge intensive ventures, but only in case of services, while spill-overs in form of graduate rollout are significantly localized.

Keywords: university; graduates; knowledge spill-overs; knowledge intensive entrepreneurship

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1. Introduction

The attempts to describe the trajectories, or the spatial "range" of academic knowledge spill-overs led to a passionate scientific debate in economy, economic geography and regional science (Melichová et.al. 2017; Kowalska, 2016; Raudeliuniene et al. 2018) Universities have been first time investigated as a determinant of localization of high-tech industries using regression tools by Markusen et al. (1986). In their cross-sectional OLS regression with data for 264 metropolitan statistical areas (MSAs) in the United States, they included public research funding to universities as a control variable. However, this factor did not appear to be significant in relation to the distribution of high-tech companies in the US. Later, using panel data on county level in U.S., Woodward et al. (2006) vice versa found a significant and positive effect of university R&D expenses on localization of high-tech plants. Certain evidence of academic impacts was brought by Glasmaier (1991), which studied the spatial distribution of high-tech factories both in municipalities and their surrounding rural regions in US. He found that universities mainly attract educated labor force for high-tech firms and therefore can be considered as a significant factor for the location of high-tech plants, but only on local level. Florax and Folmer (1992) directly oriented their investigation on academic knowledge effects, as previous papers considered local or regional stock of academic knowledge only as a control variable. University knowledge effects were captured by two proxies – one measuring the contagious distribution of knowledge, second expressing hierarchical knowledge in space. Their results suggest only small positive impact of hierarchical knowledge distribution, also only for manufacturing equipment industry.

Using regional availability of researchers as an academic proxy, Audretsch and Stephan (2007) have demonstrated a strong positive relationship between localization of academic scientists and the location decisions of enterprises from biotechnology sector. They have further shown that in close spatial proximity of universities are localized mainly enterprises, in which academic scientists act as founders, co-founders, and members of various advisory committees. Likelihood that the biotechnology company locates near the university is also significantly increased, if university employs Nobel Prize winners. Audretsch and Keilbach (2007) also proxied university knowledge impact on emergence of new high-tech firms by the share of researchers on the total population in the region. Results of their empirical model based on data about emergence of new firms in 440 German LAU1 regions suggest that academic research and development intensity in a region positively influence (Zeibote et al. 2019) emergence of new high-tech ventures. They found no impact of academic research on low-tech firms and on total number of firms. The study of Hunady et al. (2018) or Mura et al. (2017) shows that universities can also support success of emerging start-ups. Acs, Arminghton and Zhang (2006) were interested whether the access to the spill-overs of university knowledge can be considered as prerequisite for the survival of new high-tech ventures. They found a positive impact of university graduates drop-out rate on survival of high-tech ventures in US 3 years after establishment. Baptista and Mendonça (2010) measured impact of university presence in a region, structure of students and graduates enrollment on emergence of new KIFs in Portugal. They found that both academic knowledge proxies explain dynamics of knowledge intensive manufacturing and also knowledge intensive services emergence. Furthermore, when shares of students and graduates in social sciences and engineering were taken into account, their results suggest that academic impact on new knowledge intensive manufacturing is to a large extent explained by students and graduates of specific technological study programs, while the effect of students and graduates in different academic fields is not significantly altered in case of knowledge intensive services.

The above-mentioned studies have focused on investigation of academic knowledge impacts on knowledge intensive entrepreneurship, either in tacit or codified form. Acosta et al. (2011) simultaneously evaluate impacts of tacit (graduates) and explicit (patents, publications) knowledge produced by universities on new business

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formation in high-tech industries in Spain. However, only production of high-quality human capital by universities appears to be academic factor explaining emergence of high-tech start-ups in Spain. Similar approach took Bonacorsi et al. (2014) in their spatial analysis, but in addition to distinguishing the tacit and explicit knowledge of universities, they also assessed the impact of the quality of universities on the number of knowledge intensive start-ups. Using data on NUTS III regions in Italy, they proved positive impact of both tacit and codified knowledge of high-quality universities, however only knowledge protected by intellectual property rights is capable to cross regional boundaries. Authors found no effects of both tacit and codified knowledge in case of universities of lower quality. Fritsch Aamoucke (2013) worked with dataset containing information on new start-ups in Germany between 1995-2008. This data allowed them to distinguish start-ups in high-technology manufacturing industries, technologically advanced manufacturing industries and technology-oriented services. The impact of universities was measured by the number of universities, number of professors, number of students, PhD students and the volume of external funding sources. Firstly, results differ according to character of research in scientific discipline (basic vs. applied). Another finding was that the spatial proximity of new start-ups to universities appears to be more influenced by number of professors at universities in comparison with the number of students or graduates, what means that tacit knowledge of universities is also necessary to differentiate – on knowledge embodied in founder and access to expertise of research staff. The results also suggest that with increasing spending on research and development in these start-ups, impact of academic spill-overs grows. Calcagnini et al. (2014) based their quantile regression on the assumption of a decreasing distance between the newly created start-ups and the university in dependence of graduates' enrollment, the quality of universities in the region, and their "third mission" activities. Using data about 1978 knowledge-intensive start-ups in Italy between 2004-2010, they proved not only positive impact of academic knowledge on startup localization close to university, but also that localization decision of knowledge intensive firms depends on their interest in tacit or explicit knowledge and available knowledge transfer channels. The most positive academic impact was recorded in case of graduates enrollment, especially in social sciences, while from individual transfer activities of university, only production of spin-off companies explain localization pattern of new knowledge intensive start-ups.

From university impact studies on local level, it is fitting to mention contribution of Korosteleva and Belitsky (2013), even if they focused on small businesses in general. Their empirical model was based on data of 98 cities in 7 post-socialist economies in transition. They demonstrated the positive impact of localization of the university in the city, its graduate production and also production of MBA graduates on the dynamics of emergence small businesses in conditions of local economies of post-socialistic countries. We also choose to mention another contribution outside of US and Western Europe. Nagy (2016) and Fischer et al. (2018) assessed the gravitational effects of universities on knowledge intensive investments in Brazil. Author also evaluates impact of university knowledge on development of international networks in the region. Using data at 645 municipalities and 43 microregions in the state of San Paulo, Brazil, they investigated academic knowledge impact measured by the graduates' enrollment and the presence of high-quality universities in region on knowledge intensive investments, and knowledge intensive investments of multinational firms. It is also another study distinguishing knowledge-intensive production and services. However, the results of the analysis suggest that there is practically no statistically significant or positive effect of universities on the emergence of both knowledge intensive manufacturing and services in Brazil. These investments being conducted under the conditions of the surveyed country rather than traditional factors of urbanization, agglomeration effects or infrastructure. These investments appear to be influenced in conditions of Brazil only by the traditional factors of urbanization, agglomeration effects, or infrastructure.

In our paper, we will focus on university impacts on spatial patterns of knowledge intensive entrepreneurship. Instead of assessing the dynamics of KIF's formation from perspective of founder, firm or industry specific factors, our attention will be drawn to regional differences (Haviernikova, 2018; Tvaronavičienė, Razminiene, 2017; Jaskova, Haviernikova, 2016; Prakash, Garg, 2019; Pavolová et al., 2019; Girdzijauskaite et al., 2019)

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affecting successful application of innovative ideas – especially to stock of regional academic knowledge capital. To discuss chosen approach to investigation of the issue, firstly we added relevance to our work by attempt to answer the question whether we can observe knowledge spill-overs and impact of lower-quality universities (only 2 universities ranked in SCIMAGO top 500 in 2018) on knowledge intensive businesses formation in conditions of post-socialistic country. We consider as more conductive to investigate the aforementioned university impact on knowledge intensive entrepreneurship than incumbent firms (Kowalska, 2016), as there is assumption that KIFs produce more innovative products and services (Wierzbicka, 2018; Tvaronavičienė, 2017; Zauskova, Grib, 2016; Dubravska, Sira, 2014.) and have a higher potential to generate employment growth in the medium and long term (Mura et. al, 2017; Obisi and Aliyu, 2018). Secondly, we also choose to investigate spatial patterns of emergence of knowledge intensive firms on spatial level of LAU1 regions in Slovakia, using tools of spatial econometrics to test the effects of external academic knowledge on emergence of knowledge intensive firms. We choose to measure academic impacts only trough carriers of tacit knowledge (Abramovsky et al., 2007; Audretsch and Stephan, 1996), as we cannot suggest that explicit knowledge basically measured by number of academic patents can influence formation of KIFs in Slovakia, as there is very low patenting activity of Slovak universities (Duľová et al. 2017).

2. Material and methods

According to arguments discussed in previous section, we hypothesize that formation of new knowledge intensive ventures can be affected by universities primarily through graduates rollout and knowledge spillovers. In order to investigate these relationships, we constructed dataset that contains observations on variables obtained from several sources (Tab 1) for period of 11 years between 2006-2016, on the LAU 1 spatial level. We identified new knowledge intensive ventures in Slovakia using dataset ELIS (Register of business entities in Slovak republic), by filtering the newly established KIF's according to NACE classification. Eurostat's aggregation of knowledge intensive industries (2014) based on NACE rev.2 (Appendix) allowed us to further distinguish between knowledge intensive firms, knowledge intensive manufacturing, knowledge intensive services and more specifically knowledge intensive business services and thus get more detailed information about university knowledge impacts on these knowledge intensive activities in regions. However, we can still assume that such aggregation can be "fuzzy" to some extent, as these companies cannot be automatically considered to be innovative just for its affiliation to certain knowledge intensive industry (Madrak-Grochowska, 2015). Data on academic graduates were obtained from Centre of Scientific and Technological Information of Slovak Republic (CVTI), that regularly disclose data on basic indicators of higher-education.

Academic spill-overs from universities will be measured by number of senior researchers (professors and associated professors). The main argument for this approach is that majority of Slovak universities are still only at the beginning of the process of building the institutional environment for knowledge transfer into market. Similarly as in all V4 countries (Kondratiuk-Nierodzińska, 2016; Horváth and Hollósy, 2018; Horecký, 2018), dynamics of protection of IP rights to produced technologies is in Slovak conditions very low. Thus, majority of contacts between entrepreneurs and universities are facilitated on the level of interpersonal linkages - both of formal and informal character.

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Table 1. Variables used in empirical analysis

variable	definition	source
graduates	number of university graduates$_{it}$	CVTI SR
professors	number of professors and associated professors$_{it}$	CVTI SR
kif	number of knowledge intensive firms$_{it}$	ELIS
kim	number of knowledge intensive manufacturing firms$_{it}$	ELIS
kibs	number of knowledge intensive business services$_{it}$	ELIS
kis	number of knowledge intensive services$_{it}$	ELIS
large firms	number of firms with more than 250 employees$_{it}$	ELIS
innovations	number of patents and utility pattern in private sector$_{it}$	ÚPVSR
incubators	number of business incubators$_{it}$	SBA
population	number of residents$_{it}$	ŠÚSR
unemployment	% of unemployed population$_{it}$	ŠÚSR
avg. wage	average wage$_{it}$	ŠÚSR

Source: own processing

We decided to carry out our analysis on LAU 1 spatial level. Main argument for our choice of spatial aggregation lies in fact that there are only 8 NUTS III regions in Slovak Republic and 79 LAU1 regions, what makes LAU1 region on the first hand appropriate spatial level for statistical analysis, but on the other hand, there is also logical assumption that in country with such a small area, backwash and spreading effects can be better explained at LAU 1 spatial level. It also should be added that we integrate 5 districts of capital city Bratislava, and 4 districts of second biggest city Košice into one, as certain data are available only for these aggregated districts. We formulate following research hypothesizes:

- **(H1)** Both graduate enrollment by universities and knowledge spill-overs measured by availability of senior researchers have statistically significant and positive effect on formation of KIFs in Slovak LAU 1 regions and statistically significant and negative effect on formation of KIFs in neighboring regions (backwash effects).

- **(H2)** Both graduate enrollment by universities and knowledge spill-overs from universities expressed as availability of senior academic researchers have statically significant and positive effect on formation of the new KIM firms in LAU 1 regions of universities localization and statistically significant and negative effects on KIM firms in neighboring regions

- **(H3)** Both graduate enrollment by universities and knowledge spill-overs from universities expressed as availability of senior academic researchers have statically significant and positive effect on formation of the new KIBS in LAU 1 regions of universities localization and statistically significant and negative effects on KIM firms in neighboring regions

- **(H4)** Both graduate enrollment by universities and knowledge spill-overs from universities expressed as availability of senior academic researchers have statically significant and positive effect on formation of the new KIS in LAU 1 regions of universities localization and statistically significant and negative effects on KIM firms in neighboring regions

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We will construct overall 8 models, which differ in two observed academic independent variables - number of graduates and number of senior academic researchers in region, and in four different dependent variables – number of newly established KIF, KIM, KIBS and KIS. We also include into our models several control variables that account for factors that affect new KIF creation, other than those related to university knowledge. Firstly, we need to note, that data for lot of indicators that are standardly used to explain localization patterns of KIF's are not collected in conditions of Slovak Republic. However, as we discussed in section 2, we want to control for number of large enterprises in regions, as there is precondition that knowledge intensive ventures locate near large firms to provide technologies and services for them. We consider to be suitable to measure knowledge spill-overs from private sector by innovations (Kendiukhov, Tvaronaviciene, 2017; Potkany et al. 2018) that were produced by private enterprises in individual regions (Prokopenko et al. 2018; Simo et al. 2016), and so we include variable "innovations" that was created using database of Industrial Property Office of Slovak Republic. This database was used to calculate sum of number of patents and utility patterns of private sector ventures for each Slovak LAU1 regions. We decided to integrate patents with utility patterns, as utility patterns protect new industrially applicable technical solutions resulting from inventive activities, thus can be also considered as innovations. Further we constructed dummy variable for presence of business incubators in region, as there are only 22 business incubators altogether in Slovak Republic, but each of them can have certain impact on formation of KIF's. We use indicator population, expressed as number of inhabitants with permanent residence in regions to control for attractiveness of regions both for living and for establishment of business. Level of unemployment in regions will serve to control for option, that unemployed people with university degree often tend to establish business, mainly in situation, when they cannot find job in their field of study on regional labor markets and also for option of proposition of labor supply by KIF's. Finally, average wage will be used to control for cost effects on the side of enterprises, as there are no other cost-related data publicly available in Slovak conditions. We also control for effect of total number of KIBS in region on emergence of new KIM ventures and vice versa, to check for colocalization of these firms.

$$y = \rho W_1 y + \beta_0 + X\beta_1 + W_1 X\beta_2 + \varepsilon \quad (1)$$

or:

$$y_i = \rho \sum_{i=1}^{n} w_{ij} y_j + \beta_0 + \sum_{k=1}^{l} \beta_{1k} x_{ki} + \sum_{k=1}^{l} \beta_{2k} \sum_{j=1}^{n} \beta_{2k} w_{ij} x_{kj} + \varepsilon_i \quad (2)$$

where:
y = vector of dependent variable (n×1)
X = matrix of independent variable (n× (k+1))
B = vector of regression coefficient parameter ((k+1) ×1)
ρ = spatial lag coefficient parameter on dependent variable
n = number of observations or locations (i= 1,2,3,...,n)
k= number of independent variables (k = 1,2,3,...,l)

We will focus on relationship between our dependent variables in given region and our dependent variables in given region and independent variables in neighboring regions, thus we use weight matrix based on continuity approach, more exactly queen continuity of 1st order (either common border or vertex).

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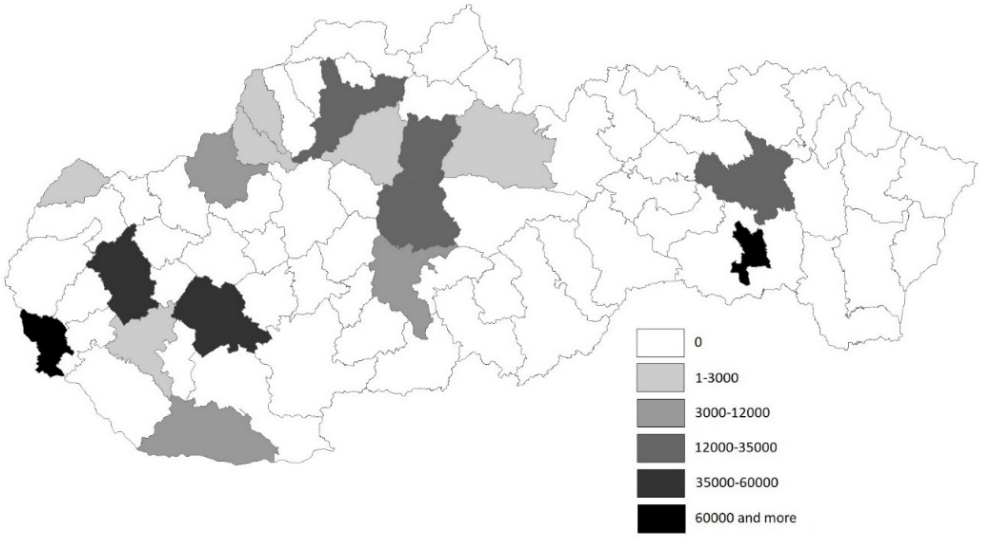
3. Results and discussion

In 2016, there were 36 universities, or high-schools in Slovak Republic, out of which 20 were public, 15 private and 3 were state universities. Nine of the Slovak universities are allocated in cities that are seats of the district, but not the NUTS III region and also many faculties of universities are also allocated in these smaller cities, what gives rationale to work on this spatial level LAU1. Saying that, it still should be noted that 14 of 36 universities are allocated in capital city Bratislava, as can be also observed on map 1, where we can see that university graduates concentrate mainly in Bratislava, second biggest Slovak city Košice that is center of eastern Slovakia and in several other cities that are centers of NUTS III regions – Trnava, Nitra, Trenčín Banská Bystrica, Žilina and Prešov.

On the national level, we can observe that number of graduates was growing between 2006 and 2010, when reached maximum and since 2011 we observe decrease of graduates rollout caused most probably by demographical changes and increased share of Slovak students that choose to rather study abroad (Table 2). Having still smaller number of students, number of professors was growing until 2015. We suppose this trend can be related mainly to the ongoing process of generation exchange and the growing need for associated professors and professors for conducting research projects, which can be considered as the most important supplement, extra-budgetary income of faculties of Slovak universities. Many professors also teach on several Slovak universities at once, thus are calculated several time in statistics. Map 1 displays concentration of graduates in 16 regions, where universities are allocated. As we can see, majority of graduates are produced mainly in regions of western and northern Slovakia.



Map 1. Spatial distribution of all graduates produced by Slovak universities between 2006 and 2016.

Source: own processing

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The number of newly created knowledge intensive ventures, both manufacturing companies and service ones, fluctuated significantly during 2006-2016. As shown in Table 2, significant differences in total number of created knowledge intensive firms can be observed particularly after 2011. Both new knowledge intensive manufacturing and service start-ups reached highest value in 2012. It is hard to hypothesize which factors could have affected the extreme increase of the values in this year as there has been no major legal changes affecting business environment in previous year, nor in 2011. This fact is greatly in contrast with values in 2015, as we can say that in given year Slovak Republic has already had a stable economic growth for several years.

Table 2. Total number of university graduates and senior researchers between 2006-2016, number of new knowledge intensive manufacturing firms a knowledge intensive services between 2006-2016.

year	graduates	professors	new KIM	new KIS
2006	21105	3710	390	10818
2007	24433	3497	484	10230
2008	35400	3587	473	11107
2009	42508	3905	276	9688
2010	43872	3852	338	12104
2011	42653	3915	351	12226
2012	42056	4044	828	26558
2013	40699	4061	348	11964
2014	39953	4156	234	8219
2015	38271	4240	87	3594
2016	36427	4166	224	7697

Source: own processing

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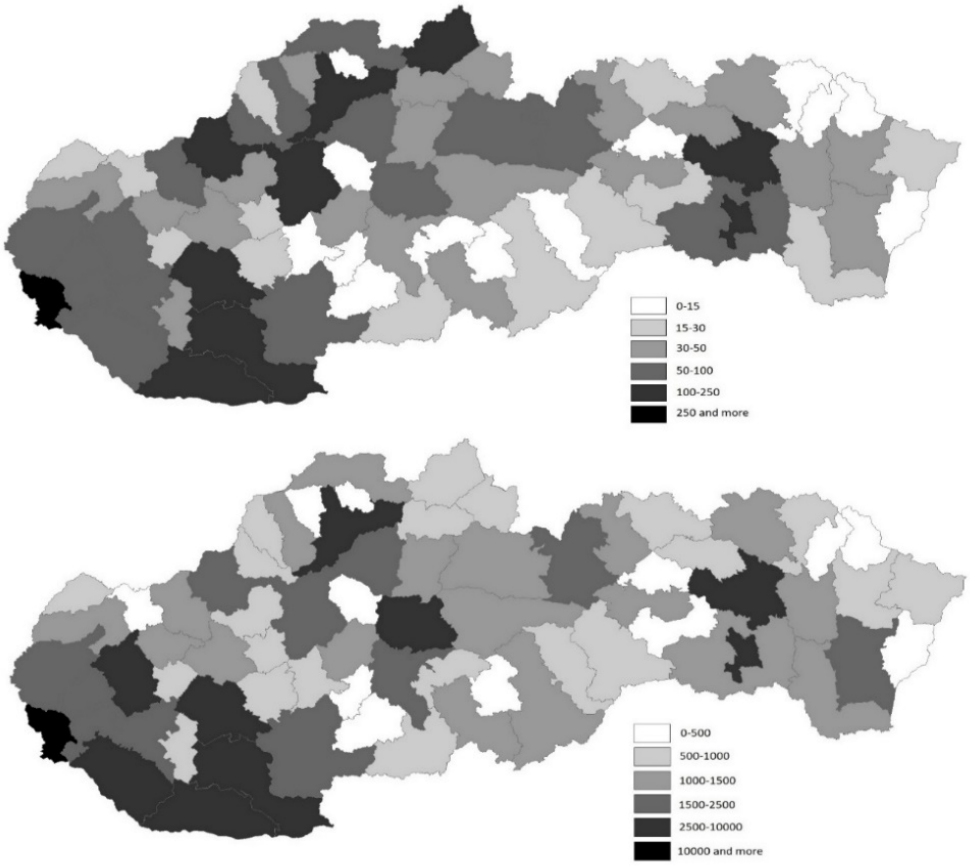

Map 2. and **Map 3**. Spatial distribution of new KIMs and KISs established between 2006-2016

Source: own processing

As shown on Map 2 and Map 3, we can observe spatial concentration of both knowledge intensive manufacturing ventures and services in Bratislava and Košice regions and lack of knowledge intensive activities mainly in regions that are considered to be less developed. Except for mentioned regions, where two Slovak major cities are allocated, we cannot observe significant patterns of concentration of both knowledge intensive manufacturing and services. In case of knowledge intensive manufacturing we can observe that there is more significant increase in amount of these firms in regions of western and northern Slovakia in comparison with eastern part of the country, what is connected with industrial tradition in this regions, higher share of educated human capital, availability of highways and transport connection with capital city and other factors. We can also observe on Map 2 and Map 3 certain patterns of colocalization of knowledge intensive manufacturing and services, however, it is possible to notice that emerging knowledge intensive services appears to be slightly more dispersed in space, what is consistent with the logical assumption, as that the provision of services is less capital intensive compared to manufacturing.

We will move towards interpretation of results of our analysis. First of all, we need to note that our analysis was performed in Stata software. We first run basic ordinary least squares regressions and panel regressions with fixed and random effects (Mura et al. 2018) to check for spatial dependencies, basic problems and to decide between fixed and random effects for spatial approach. Based on statistically significant Lagrange multipliers and Robust

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Lagrange multipliers in spatial diagnostics we consider propriate to investigate spatial effects. We used Hausman test to choose between model with fixed and random effects. Results suggest using models with fixed effects.

Table 3. Results of SDM with fixed effects using start-ups of knowledge intensive firms as dependent variable

Variable	**Model I.** coefficient	spatial lag	**Model II.** coefficient	spatial lag
graduates	0,451*	-0,012**		
	(0,023)	(0,010)		
professors			-5,777***	1,529***
			(0,680)	(0,330)
kim				
kibs				
large firms	-8,306	3,884	-36,053***	10,499***
	(5,519)	(2,543)	(5,606)	(2,515)
Innovations	-12,387**	4,033*	-4,866	2,471
	(4,363)	(2,001)	(4,129)	(1,897)
Incubators	29,574	-11,678	-5,856	2,818
	(92,428)	(40,478)	(87,119)	(38,108)
Population	-0,017***	0,006**	-0,016***	0,005**
	(0,005)	(0,002)	(0,004)	(0,002)
Unemployment	-8,699	-0,286	-6,158	-0,970
	(5,129)	(1,132)	(4,838)	(1,034)
avg. Wage	-0,484**	0,119***	-0,414**	0,092**
	(0,159)	(0,033)	(0,151)	(0,032)
Number of observations	792	792	792	792
Spatial Rho	0,3035***		0,3034**	
R-sq:				
Within	0.0069		0.0443	
Between	0.6919		0,7551	
Overall	0.5045		0,5560	

** statistical significance on levels: p<0.05, ** p<0.01, *** p<0.001; standard errors in brackets.*

Source: own processing

Results of spatial Durbin models presented in Table 3 shows that graduate rollout positively affects formation of new knowledge intensive firms in Slovak Republic, while we also found no spreading, but backwash effects of graduates on new KIFs emergence in neighboring regions in line with hypothesis H1. Thus, we can suggest that university graduates tend to rather start business in regions, where their former university was allocated, even if they have not residence in that region. Considering results for knowledge spill-overs from university measured by number of professors, we find no support for H1 hypothesis, as coefficient of professors took negative value. On the other hand, there is positive spatially lagged coefficient of variable professors, what can be explained by longer spatial range of knowledge spill-overs from universities in conditions of country small as Slovak republic.
As universities are in conditions of our country localized mainly in bigger municipalities that are also centers of NUTS III regions, we can speculate that KIFs in those regions have better access to spill-overs from private sector, oftentimes own research and development capacities, or those firms can benefit from more qualified and

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skilled human capital. It is worth noting that there is also higher share of foreign firms in regions with university cities, which are mostly subsidiaries of large foreign firms that invest to research out of Slovakia.

Among the controls, we observe that new knowledge intensive ventures tend not to locate around concentrations of large enterprises, but rather in surrounding regions. We can observe this spreading effect mainly around capital city Bratislava (there is currently noticeable process of dislocation of economic activities to surrounding districts of Senec, Pezinok and Malacky due to the high real estate costs) and another regional centers. This is also connected with results for indicator innovations, as knowledge intensive ventures locate around regions, where private research and development results concentrate, what is in contrast with development in wester European countries, where the progressing concentration of knowledge-intensive activities leads to the emergence of knowledge-hub regions (could be caused by low level of spatial aggregation of data). In Slovak conditions is this link explicable particularly due to the fact that legally protected innovations are predominantly produced by large companies. Business incubators appears to have no influence on knowledge intensive activities. This result need further investigation, but we can suggest that even in condition of country like Slovakia, current network of incubators can be considered as small (only 20 incubators, mostly in large cities) and insufficient to deliver real impact on knowledge intensive activities, or need to be more oriented on support for knowledge intensive activities, instead of less-knowledge intensive start-ups. We also get another strong evidence that the process of deconcentration of knowledge intensive activities from larger cities take place in Slovakia, as coefficient for population gained negative value, and lagged coefficient positive value.

Hence, we suppose that founders of knowledge intensive ventures tend to move to smaller cities to reduce costs of living and running business. In contrary with basic regression models, we found no support for assumption that unemployed people tend to run knowledge intensive business. We have come to this assumption, because there is relatively high level of unemployed university graduates in Slovak Republic in comparison with western countries. Finally, knowledge intensive ventures in Slovakia tend to rather choose location around regions with higher level of average wage, thus we found certain evidence that even in case of such businesses, it is still required to minimize costs in Slovak conditions. These explanations are still not enough decisive for us, as breakdown of KIF to KIM, KIBS and KIS is required due to relatively high share of knowledge intensive services on total numbers of knowledge intensive firms.

Now, we will turn our attention to the interpretation of results of models with dependent variable number of newly emerged knowledge intensive manufacturing ventures as presented in Table 4. Both coefficients for graduates in case of new KIM firms reveal that graduates practically affect only formation of knowledge intensive services. Naturally, there can be no expectation of founding manufacturing ventures by academic graduates soon after studies, but we were also interested to check whether KIM ventures do not locate close to universities to get access to potential high-quality employees. Hence, we failed to meet first part of conditions in hypothesis H2. We cannot check for effect of full regional stock of high-quality human capital, as data for total numbers, or proportion of population with tertiary degree is collected in Slovakia only for ten year census. However, we fail to find support for hypothesis H2 also as we found no evidence of impact of knowledge spill-overs from universities on emergence of new knowledge intensive manufacturing ventures in both regions where universities are allocated and neighboring regions. This means that localization of such manufacturing ventures in Slovak conditions is still led by more by traditional factors, or private knowledge spill-overs, as there is also detected the positive impact of private innovations on their location decisions, but only from surrounding regions. Thus, we proved that KIM firms tend to locate in regions that neighbor with those with high level of private research concentration. Further, we found in both models with dependent variable knowledge intensive manufacturing (Table 4) and knowledge intensive business services (Table 5) relatively strong evidence of colocalization patterns of these firms.

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Table 4. Results of SDM with fixed effects using start-ups knowledge intensive manufacturing as dependent variable

Variable		**Model I.**		**Model II.**	
		coefficient	spatial lag	coefficient	spatial lag
graduates		-0,001*	0,001		
		(0,000)	(0,000)		
professors				-0,015	0,004
				(0,014)	(0,007)
kim					
kibs		0,023***	-0,009***	0,022	-0,009
		(0,001)	(0,000)	(0,001)	(0,000)
large firms		-0,150	-0,034	-0,155	-0,041
		(0,104)	(0,048)	(0,116)	(0,051)
innovations		0,067	-0,023	0,048	-0,021
		(0,083)	(0,038)	(0,083)	(0,038)
incubators		-3,013	0,722	-2,823	0,706
		(1,739)	(0,762)	(1,742)	(0,762)
population		0,000	0,001	0,001	0,001
		(0,000)	(0,000)	(0,000)	(0,000)
unemployment		0,009	0,011	0,028	0,012
		(0,097)	(0,022)	(0,097)	(0,021)
avg. wage		-0,018***	0,004***	-0,018	0,004
		(0,003)	(0,001)	(0,003)	(0,001)
Number of observations		792	792	792	792
Spatial Rho		0,3034**		0,3034*	
R-sq:					
	within	0,1386		0,1387	
	between	0,0020		0,0067	
	overall	0,0000		0,0011	

** statistical significance on levels: p<0.05, ** p<0.01, *** p<0.001; standard errors in brackets.*

Source: own processing

There are observable backwash effects on both kinds of enterprises on each other – manufacturing tend to locate in regions with high availability of knowledge intensive business service and vice versa. In contrary with results for KIFs in total, we find no colocalization patterns of knowledge intensive manufacturing with large enterprises in general. However, it is also desirable to note, that that on non-panel ordinary least squares regression we identified relatively higher, but still acceptable level of multicolinearity between KIMs and large enterprises, as there is logical assumption that significant share of knowledge intensive manufacturing firms employ more than 250 employees in Slovak condition. After interpretation of indicator incubators for previous models, we consider to be logical that there is no statistically significant relationship between KIM firms and availability of incubators in Slovak regions. We also find no effect of agglomeration effects measured by number of inhabitants per region in case of manufacturing, what suggest that emergence of these kind of knowledge intensive firms is less sensitive to availability of large cities in comparison with services. We would expect that certain impact of unemployment can occur in case of knowledge intensive manufacturing ventures, as we already know that significant share of these enterprises can be considered as large from employment point of view, but both coefficients are not statistically significant. Again, we find evidence that also knowledge intensive manufacturing ventures allocates

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around regions with high level of average wage, but get statistically significant coefficients only for model controlling for number of graduates, nor knowledge spill-overs trough professors.

Table 5. Results of SDM with fixed effects using knowledge intensive business services as dependent variable

Variable	**Model I.**		**Model II.**	
	coefficient	spatial lag	coefficient	spatial lag
graduates	0,058***	-0,017***		
	(0,012)	(0,005)		
professors			-1,740***	0,312
			(0,386)	(0,187)
kim	19,679***	-5,512***	19,075***	-5,414***
	(0,843)	(0,276)	(0,867)	(0,284)
kibs				
large firms	-0,393	1,829	-12,381***	4,425**
	(2,885)	(1,324)	(3,176)	(1,403)
innovations	-7,521***	1,932	-4,015	1,367
	(2,278)	(1,049)	(2,289)	(1,056)
incubators	63,826	-21,420	41,778	-13,810
	(48,152)	(21,128)	(48,328)	(21,173)
population	-0,008**	0,002	-0,008***	0,002
	(0,002)	(0,001)	(0,002)	(0,001)
unemployment	-3,284	0,022	-3,502	-0,104
	(2,671)	(0,596)	(2,681)	(0,582)
avg. wage	0,223**	-0,055**	0,246**	-0,062***
	(0,085)	(0,012)	(0,085)	(0,018)
Number of observations	792	792	792	792
Spatial Rho	0,3041*		0,0340	
R-sq:				
within	0,4195		0,4243	
between	0,1613		0,3859	
overall	0,0637		0,2597	

** statistical significance on levels: p<0.05, ** p<0.01, *** p<0.001; standard errors in brackets.*

Source: own processing

In the following part of our interpretation of results, we will pay attention to factors affecting localization of new knowledge intensive business services in Slovak republic, as presented in Table 5. We found statistically strong, and actually most significant evidence of impact of graduates rollout on emergence of KIBS among all investigated types of knowledge intensive activities in Slovak regions. The graduates tend to support knowledge intensive business services emergence in regions, where they graduated, what is in line with hypothesis H3. We also found support for assumption in H3 hypothesis that there are expected backwash effects - the more graduates in the region, the less knowledge intensive services for entrepreneurs in the surrounding regions. Similarly, as in case of basic ordinary least squares estimates and panels with fixed and random effects, we got negative coefficient for knowledge spillovers trough professors, but positive for spatial lag of this variable, what is in contrary with H3. From these results, we can only suppose that know-how and knowledge of senior academic researchers is more required in regions with smaller cities, with not so significant concentration of private research and higher share of domestic firms.

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Knowledge intensive business services locate more in neighboring regions to those, where large enterprises concentrate, according to negative value of coefficient and positive of spatially lagged coefficient. In case of innovation production in private sector impact, we can only state that concentration of private research negatively impacts formation of new knowledge intensive business services, but we recorded statistically significant evidence only in case of model with graduates as university control. Than we also recorded the negative effect of agglomeration effects on KIBS measured by total number of inhabitants of region. We did not get significant estimations for spatially lagged variable, thus we cannot say, whether this information support results for KIM firms that deconcentrate from larger cities and are colocalized with KIBS. We again found no statistically significant effect of unemployment, but reversed effect of average wage as in case of knowledge KIM firms. In comparison with KIM firms, KIBS rather locate in regions with higher average wage, while those regions drain KIBS from those, where costs of employment are lower. Hence, we can accept logical assumption that business services are more dependent on concentration of entrepreneurship.

Table 6. Results of SDM with fixed effects using knowledge intensive services as dependent variable

Variable	**Model I.** coefficient	spatial lag	**Model II.** coefficient	spatial lag
graduates	0,019	-0,003		
	(0,016)	(0,007)		
professors			-3,488***	0,658**
			(0,488)	(0,237)
kim	26,928***	-7,871***	25,157***	-7,556***
	(1,112)	(0,365)	(1,096)	(0,360)
kibs				
large firms	-0,097	2,766	-16,594***	5,786***
	(224,129)	(1,747)	(4,016)	(1,774)
innovations	-7,562*	1,443	-3,688	0,762
	(3,004)	(1,384)	(2,895)	(1,336)
incubators	98,002	-23,606	76,537	-14,646
	(63,523)	(27,872)	(61,117)	(26,776)
population	-0,007*	0,002	-0,008*	0,002
	(0,003)	(0,001)	(0,003)	(0,001)
unemployment	-4,480	-0,143	-3,167	-0,391
	(3,524)	(0,787)	(3,391)	(0,736)
avg. wage	0,168	-0,038	0,173	-0,040
	(0,112)	(0,024)	(0,108)	(0,023)
Number of observations	792	792	792	792
Spatial Rho	0,3040*		,3040*	
R-sq:				
within	0,3883		0,4401	
between	0,0228		0,3712	
overall	0,0053		0,2525	

** statistical significance on levels: p<0.05, ** p<0.01, *** p<0.001; standard errors in brackets.*

Source: own processing

While interpreting the last models with dependent variable knowledge intensive services (aggregated), we will pay more attention to the relationship between results for KIBS and KIS, as data for KIBS are built as

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subcategory of aggregated knowledge intensive industries in KIS data. Firstly, as shown in Table 6, we found interesting relationship for observed independent variable graduates, as in case when we aggregate knowledge intensive business services with another knowledge intensive services that are not oriented on the services provision to enterprises (this may be a question of the extent to which some of these non-business services can be truly considered to be knowledge intensive, and to what extent), we found no statistical significance of this control, what is in contrary to the hypothesis H4.

But we still found statistically significant effect of knowledge spill-overs from professors. This way measured knowledge spill-overs of universities again positively influence only emergence of new knowledge intensive services in more peripheral regions, thus we also again failed to meet conditions of H4 hypothesis. The colocalization patterns was found also in this case, as coefficient for control KIM was negative, while spatially lagged coefficient took positive value. In case of model that controls for knowledge spill-overs in form of links to professors, we found support for previous results that knowledge activities locate in neighboring regions to those, where large enterprises are concentrated. Quite similar results in comparison with KIBS were recorded also for controls innovations, incubators, population and unemployment, but we found no significant effect of average wage on aggregated KIS. Hence, cost effects probably affect more knowledge intensive activities oriented on provision of services to the businesses.

Conclusions

The vaste majority of authors agree that universities affect economic activities in various geographic areas (Woodwart et al., 2006; Bonnacorsi et al. 2014, Fischer et al. 2018). This article is an attempt to deliver empirical evidence that even in case of small, post-socialistic state of Eastern Europe that lacks research excellent universities, academic sector influence development of knowledge intensive entrepreneurship. In order to do so, we decided not to measure academic impacts on knowledge intensive entrepreneurship by mix of basic university knowledge-based outputs (patents, publications and graduate, as is currently preferred in scientific literature (Caree et. al. 2013), as Slovak Universities have quite low patent activity (e.g. there was only 25 patent application filled altogether by 38 Slovak universities and high schools in 2016). We rather considered to be more appropriate in Slovak conditions to follow approach of Fritsch and Aamoucke (2013) and base our research focus on two basic assumptions. Firstly, graduates may establish new businesses mainly in knowledge-intensive industries, based on their research for final thesis, or simply knowledge and skills acquired during studies. Due to this argument, we can consider graduates to be also academic knowledge spill-over as university knowledge relevant for running business in knowledge intensive industries is directly embodied in them (Lorincová, 2018; Kucharcikova, et al. 2018). Furthermore, rather the knowledge spill-overs from senior academic researchers, potentially transferable on the basis of inter-personal relationships can be considered as determinant of knowledge intensive ventures localization.

By this empirical study, we have helped to fill the gap in the research of university impacts on formation of regional environment, specifically on development of knowledge intensive entrepreneurship in several ways. First, we have carried precise analysis of academic impacts on knowledge intensive entrepreneurship in conditions of Slovakia. Than, we used the classification of Eurostat to calculate values for newly emerged knowledge intensive firms disaggregated to several categories – total number of knowledge intensive firms, knowledge intensive manufacturing firms, knowledge intensive business services, and all knowledge intensive services. We also consider as an added value that we adopted spatial approach to check for backwash and spreading effects.

While controlling for several non-academic factors, we found empirical evidence for assumption that knowledge spill-overs embodied in academic graduates are highly localized in line with results of other authors (Acosta et al. 2011; Baptista and Mendonça, 2010; Bonnacorsi et al. 2014). We found that also in conditions of small, post-

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socialistic country, graduates tend to stay and run business in region of their university allocation, but is important to state that this only applies to knowledge intensive business services. We found only weak and minimal negative effect of graduates on knowledge intensive manufacturing and no effects of graduates from surrounding regions, what is relatively conformable with the results of Fritsch and Aamoucke (2013). In contrary with most of the research results of other authors, we failed to find support for assumption that spill-overs from senior academic researchers are also localized. We assume that this is caused by the level of spatial aggregation of data that finally appears to be suitably chosen. As Slovak LAU1 regions are relatively small (79 districts), we actually get strong evidence that there is certain impact of knowledge spill-overs measured by availability of senior researchers, but these spill-overs are considered as location factor again just by knowledge intensive services (both business and non-business) and only in peripheral regions, which centers are smaller cities (as Slovak universities are allocated mostly in districts with city that is always center of NUTS III region). Thus, it is important result that localization of knowledge intensive manufacturing ventures is in conditions of Slovak Republic (from observed factors) determined only by lower cost of labor and private research spill-overs, while we proved that universities play role in emergence of knowledge intensive business services by graduates in region of universities allocation, and also affects both business and non-business knowledge intensive services in more peripheral regions.

Further, we found strong evidence for localization patterns of knowledge intensive manufacturing in regions that neighbor with those, in which significant concentrations of large enterprises and private research and development activities are observable – thus, again around regions with large central cities. This refers to progressing process of deconcentration of economic activities in Slovakia. It is also connected with strong colocalization pattern between knowledge intensive manufacturing and services that we found. Thus, we can see that knowledge intensive services are pushed on the first hand to regions with larger regional centers, as there have more opportunities (as suggested by results for average wage), an on the other hand to surrounding regions, where knowledge intensive manufacturing ventures emerge. The presumption of this trend is supported also by results for impact of agglomeration effects, as they also refer to traced deconcentration process. In contrary to assumption of Caree et al. (2012) we found no connection between emergence of knowledge intensive firms and unemployment. Also, business incubators, as their networks is in Slovakia still considerably small and less oriented on knowledge intensive activities, do not appear to affect emergence of knowledge intensive activities.

References

Abramovsky, L.; Harrison, R.; Simpson, H. 2007. University research and the location of business R&D. *Economic Journal*, 117(519): 114-141. http://dx.doi.org/10.1111/j.1468-0297.2007.02038.x

Acosta, M.; Coronado, D.; Flores, E. 2011. University spillovers and new business location in high-technology sectors: Spanish evidence. *Small Business Economics* 3: 365 -376. http://dx.doi.org/10.1007/s11187-009-9224-4

Acs, Z.; Armington, C.; Zhang, T. 2006. The Determinants of New-firm Survival across Regional Economies. *Papers in Regional Science* 86(3): 367–391. http://dx.doi.org/10.1111/j.1435-5957.2007.00129.x

Audretsch, D.; Stephan, P. 1996. Company-scientist locational links: the case of biotechnology. *American Economic Review* 86(3): 641-652.

Audretsch, D.B.; Keilbach, M. 2007. The localization of entrepreneurship capital: Evidence from Germany. *Papers in Regional Science* 86(3): 351–365. https://doi.org/10.1111/j.1435-5957.2007.00131.x

Baptista, M.; Mendonça, J. 1010. Proximity to knowledge sources and the location of knowledge-based start-ups. *The Annals of Regional Science*, 45(1): 5–29. https://doi.org/10.1007/s00168-009-0289-4

Bekkers, R.; Bodas Freitas, I.M. 2008. Analyzing knowledge transfer channels between universities and industry: To what degree do sectors also matter? *Research Policy* 37(10): 1837-1853. https://doi.org/10.1016/j.respol.2008.07.007

Belitski, M.; Korosteleva, J. 2012. Entrepreneurial Dynamics and Higher Education Institutions: Evidence from the Post-Communist World. *Regional Studies* 51(3): 439-453. https://doi.org/10.1080/00343404.2015.1103370

Bonaccorsi, A.; Colombo, M. G.; Guerini, M.; Rossi-Lamastra, C. 2014. The impact of local and external university knowledge on the creation of knowledge-intensive firms: evidence from the Italian case. *Small Business Economics* 2(1): 261–287. https://doi.org/10.1007/s11187-013-9536-2

Calcagnini, G.; Favaretto, I.; Giombini, G.; Perugini, F.; Rombaldoni, R. 2014. The role of universities in the location of innovative start-ups. *The Journal of Technology Transfer* 41(4): 670–693. https://doi.org/10.1007/s10961-015-9396-9

Carree, M.; Malva, A. D.; Santarelli, E. 2012. The contribution of universities to growth: empirical evidence for Italy. *The Journal of Technology Transfer* 2012, 39(3): 393–414. https://doi.org/10.1007/s10961-012-9282-7

Dubravska, M.; Sira, E. 2014. The analysis of the chosen indicators of the innovatiove environment development in the Slovak republic and in the Czech Republic. *17th International colloquium on regional sciences*: 194-200. https://doi.org/ 10.5817/CZ.MUNI.P210-6840-2014-23

Duľová Spišáková, E.; Mura, L.; Gontkovičová, B.; Hajduová, Z. 2017. R&D in the context of Europe 2020 in selected countries. *Economic Computation and Economic Cybernetics Studies and Research* 51(4): 243 – 261.

EUROSTAT. 2014. Eurostat indicators on High-tech industry and knowledge intensive services. European Commission – Eurostat: Luxembourg. Available online: https://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf (accessed on 11 December 2018).

Fischer, B.B.; Queiroz, S.; Vonortas, N.S. 2018. On the location of knowledge-intensive entrepreneurship in developing countries: lessons from São Paulo, *Brazil. Entrepreneurship & Regional Development* 30(6): 612–638. https://doi.org/10.1080/08985626.2018.1438523

Florax, R. The university: a regional booster? 1992. Avebury, United Kingdom: Beatty.

Fritsch, M.; Aamoucke, R. 2013. Regional public research, higher education, and innovative start-ups: an empirical investigation. *Small Business Economics* 41(4): 865–885. https://doi.org/10.1007/s11187-013-9510-z

Ghio, N.; Guerini, M.; Rossi-Lamastra, C. 2016. University knowledge and the creation of innovative start-ups: an analysis of the Italian case. *Small Business Economics* 47(2): https://doi.org/293- 311. 10.1007/s11187-016-9720-2

Girdzijauskaite, E.; Radzeviciene, A.; Jakubavicius, A. 2019. Impact of international branch campus KPIs on the university competitiveness: FARE method. *Insights into Regional Development* 1(2): 171-180. https://doi.org/10.9770/ird.2019.1.2(7)

Glasmeier, A. 1991. *The high-tech potential. Economic development in rural America*. New Brunswick, New Jersey: Center for Urban Policy.

Haviernikova, K. 2018. Regional Dimension of Cluster Policy: Case Study Slovakia. *Proceedings of the 4th International conference on European integration 2018 (ICEI 2018), PTS 1-3. International Conference on European Integration*: 422-429

Horecký, J. 2018. Operation and action of a trade union (in terms of Czech Republic labour law). *Central European Journal of Labour Law and Personnel Management*, 1(1): 17 – 27. http://doi.org/10.33382/cejllpm.2018.01.02

Horváth, Z.; Hollósy, G. 2018. Vadász testing the public service motivation and calling in Hungary. *Acta Oeconomica Universitatis Selye* 7(2): 47 – 58.

Hunady, J.; Orviska, M.; Pisar, P. The effects of higher education on entrepreneurial activities and starting up successful business. *Inzinerine Ekonomika-Engineering Economics* 29(2): 226-235. http://dx.doi.org/10.5755/j01.ee.29.2.19069

Jaskova, D.; Haviernikova, K. 2016. The assesment of Slovak regions' competitiveness. *SGEM 2016, BK 2: political sciences, law, finance, economics and tourism conference proceedings, Vol III. International Multidisciplinary Scientific Conferences on Social Sciences and Arts*: 1077-1084

Kendiukhov, I.; Tvaronaviciene, M. 2017. Managing innovations in sustainable economic growth. *Marketing and management of innovations* 3: 33-42. http://dx.doi.org/10.21272/mmi.2017.3-03

Kondratiuk-Nierodzińska, M. 2016. New knowledge generation capabilities and economic performance of Polish regions. *Equilibrium. Quarterly Journal of Economics and Economic Policy* 11(3): 451-471. https://doi.org/10.12775/EQUIL.2016.021

Kowalska, I. 2016. Sources of financing knowledge-based economy: the case of formal, non-formal and informal education in Poland. *Oeconomia Copernicana*, 7(1): 75-90. https://doi.org/10.12775/OeC.2016.006

Kucharcikova, A.; Miciak, M.; Hitka, M. 2018. Evaluating the Effectiveness of Investment in Human Capital in E-Business Enterprise in the Context of Sustainability. *Sustainability* 10(9): 3211. https://doi.org/10.3390/su10093211

Lorincová, S. 2018. Human resource and corporate culture: Gender-based differences in the assessment. *Central European Journal of Labour Law and Personnel Management*, 1(1): 28 – 45. http://doi.org/10.33382/cejllpm.2018.01.03

Madrak-Grochowska, M. 2015. The knowledge-based economy as a stage in the development of the economy. *Oeconomia Copernicana* 6(2): 7-21. https://doi.org/10.12775/OeC.2015.009

Markusen, A.; Hall, P.; Glasmeier, A. 1986. *High tech America: the what, how, where, and why of the sunrise industries*. Boston, United States of America: Allen & Unwin.

Melichová, K.; Hrivnák, M.; Roháčiková, O. 2017. Multiplier effects and economic impact of university spending - case study of sectoral and spatial aspects of expenditures of Slovak University of Agriculture in Nitra. *Acta Oeconomica Universitatis Selye* 6(2): 119 – 137.

Mura, L., Daňová, M., Vavrek, R., Dúbravská, M. 2017. Economic freedom – classification of its level and impact on the economic security. *AD ALTA-Journal of Interdisciplinary Research* 7(2): 154 – 157.

Mura, L.; Marchevska, M.; Dubravska, M. 2018. Slovak Retail Business across Panel Regression Model. *Marketing and Management of Innovations* 4(1): 203-211. http://doi.org/10.21272/mmi.2018.4-18

Mura, L.; Haviernikova, K.; Machova, R. 2017. Empirical results of entrepreneurs' network: case study of Slovakia. *Serbian Journal of Management* 12(1): 121-131. https://doi.org/10.5937/sjm12-10418

Nagy, B. Z. 2016. Regional inequalities in the European Union. *Acta Oeconomica Universitatis Selye* 5 (1) : 109 – 118

Obisi, C.; Aliyu, M. O. 2018. Learning and development in Nigerian higher institutions: a study of employee attitude. *Acta Oeconomica Universitatis Selye* 7(2): 91 – 108

Pavolová, H.; Bakalár, T.; Emhemed, E. M.; Hajduová, Z.; Pafčo, M. 2019. Model of sustainable regional development with implementation of brownfield areas. *Entrepreneurship and Sustainability Issues* 6(3): 1088-1100. https://doi.org/10.9770/jesi.2019.6.3(2)

Potkany, M.; Gejdos, M.; Debnar, M. 2018. Sustainable Innovation Approach for Wood Quality Evaluation in Green Business. *Sustainability* 10 (9): 2984. https://doi.org/10.3390/su10092984

Prakash, R.; Garg, P. 2019. Comparative assessment of HDI with Composite Development Index (CDI). *Insights into Regional Development* 1(1): 58-76. https://doi.org/10.9770/ird.2019.1.1(5)

Prokopenko O.; Holmberg R.; Omelyanenko V. 2018. Information and communication technologies support for the participation of universities in innovation networks. *Innovative Marketing* 14(3): 17-29. https://doi.org/10.21511/im.14(3).2018.03

Raudeliuniene, J.; Tvaronaviciene, M.; Radeckyte, V. 2018. Regional Development via Entrepreneurship: Women Leadership in Lithuanian E-Commerce. *Innovation management and education excellence through VISION 2020*, Vols I -XI: 1151-1162

Simo, D.; Mura, L.; Buleca, J. 2016. Assessment of milk production competitiveness of the Slovak Republic within the EU-27 countries. *Agricultural Economics-Zemedelska Ekonomika* 62(10): 482-492. https://doi.org/10.17221/270/2015-AGRICECON

Tvaronavičienė, M.; Razminiene, K. 2017. Towards competitive regional development through clusters: approaches to their performance evaluation. *Journal of Competitiveness* 9(4): 133-147. https://doi.org/10.7441/joc.2017.04.09

Tvaronavičienė, M. 2017. Clusters, innovations and energy efficiency: if relantionship could be traced. *Marketing and Management of Innovations* 2: 382 - 391 http://doi.org/10.21272/mmi.2017.2-35

Wierzbicka, W. (2018). Information infrastructure as a pillar of the knowledge-based economy - an analysis of regional differentiation in Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 13(1), 123-139. https://doi.org/10.24136/eq.2018.007

Woodward, D.; Figueiredo, O.; Guimarães, P. Beyond the Silicon Valley: University R&D and high-technology location. *Journal of Urban Economics* 60(1): 15–32. http://dx.doi.org/10.1016/j.jue.2006.01.002

Zauskova, A.; Grib, L. 2016. Marketing communication of eco-innovations and their impact on regional development. *Marketing identity: brands we love, PT II. Marketing Identity*: 494-503

Zeibote, Z.; Volkova, T.; Todorov, K. 2019. The impact of globalization on regional development and competitiveness: cases of selected regions. *Insights into Regional Development* 1(1): 33-47. https://doi.org/10.9770/ird.2019.1.1(3)

Appendix

Aggregation of KIF	**NACE Rev. 2 codes – 2-digit level**	**Description of codes**
KIM	20, 21, 26, 27 – 30	manufacture of chemicals and chemical products; manufacture of basic pharmaceutical products and pharmaceutical preparations; manufacture of computer, electronic and optical products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.; manufacture of motor vehicles, trailers and semi-trailers; manufacture of other transport equipment
KIBS	62, 63, 69, 70, 71, 72, 73,	computer programming, consultancy and related activities; information service activities; legal and accounting activities; activities of head offices, management consultancy activities; architectural and engineering activities, technical testing and analysis; scientific research and development; advertising and market research

KIS	50, 51, 58, 59, 60, 61, 62, 63, 64, 65, 66, 69, 70, 71, 72, 73, 74, 75, 78, 80, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93	water transport; air transport; publishing activities; motion picture, video and television program production, sound recording and music publish activities; programming and broadcasting activities; telecommunications; computer programming, consultancy and related activities; information service activities; financial and insurance activities; legal and accounting activities; activities of head offices, management consultancy activities; architectural and engineering activities, technical testing and analysis; scientific research and development; advertising and market research; other professional, scientific and technical activities; veterinary activities ; employment activities; security and investigation activities; public administration and defense, compulsory social security; education, human health and social work activities; arts, entertainment and recreation

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WHY LABOR FORCE PARTICIPATION RATE RISES? NEW EMPIRICAL EVIDENCE FROM INDONESIA

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Abstract. The labor force participation rate in Indonesia has increased during the period from 2008 to 2017. This paper attempt to investigate the issue, three independent variables encompassing, gross regional domestic product per capita at current prices, male life expectancy, and the number of dependents were considered in this paper, to understand if the selected variables have an impact on the increase in the labor force participation rate in Indonesia. The regional panel data obtained from the Indonesian central bureau of statistics was extracted from the period of 2010 to 2015. The panel data model and the Hausman test were applied to test the hypotheses. The findings indicate that the fixed effect model is suitable for data analysis. The results reveal that gross regional domestic product per capita at current prices positively affect the labor force participation rate while male life expectancy was noted to have a negative effect on the labor force participation rate. Theoretically, a lower income and a higher life expectancy would encourage more people to enter the labor market, but the Indonesian data showed the different and interesting results.

Keywords: labor force participation rate; Gross Regional Domestic product per capita; life expectancy; Indonesia

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JEL Classifications: J80, J82, J89

1. Introduction

The previous global financial crisis has changed the global economic order of the world. Among the many countries, Indonesia began to feel the financial effect of the crisis during the drastic decline of the economic growth at the end of the year 2008 (SMERU, 2011). The country had recorded an economic growth of above six percent until the third quarter III-2008 and following this, the Indonesian economy began to experience an economic slowdown in the last quarter IV-2008 (Bank of Indonesia, 2009). Fortunately, the Indonesian economy was more resilient to this crisis in relation to its neighboring countries. This is endorsed by the fact that Indonesia

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was still able to record a 4.4 percent growth in the first quarter of I-2009 (SMERU, 2011). During the same period of time, there was no increase in school dropout rate or a decrease in school attendance and the labor force participation rate remained relatively stable (McCulloch & Grover, 2010) but there was an increase labor force participation rate between 2008 to 2017. This can be seen in Table 1 below.

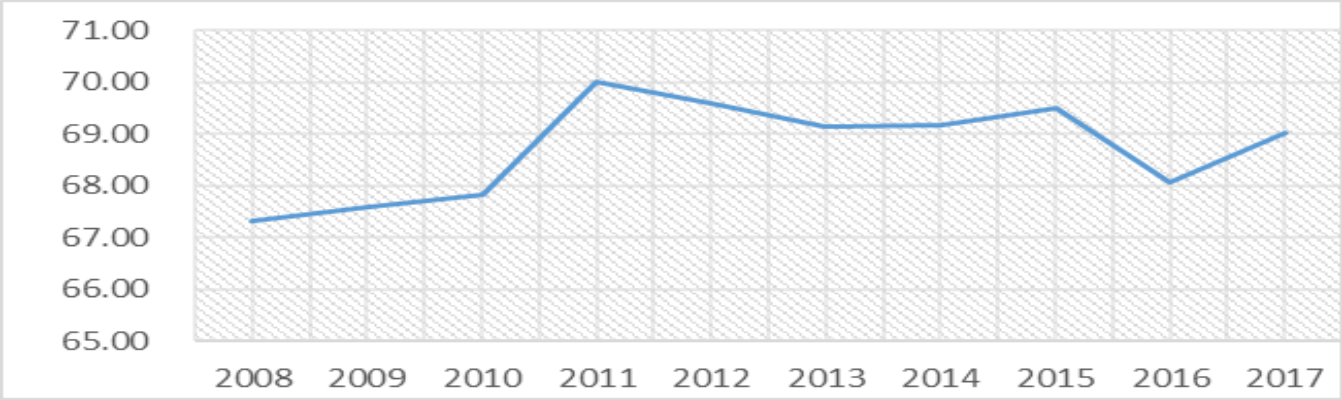

Figure 1. Labor Force Participation Rate Period 2008 - 2017
Source: Central Bureau of Statistics (2018)

Labor force participation rate can be empirically explained. Studies (see Balleer, Gómez-Salvador & Turunen, 2009; Cai, 2009; Dayıoğlu & Kirdar, 2010; Luque, 2013; AaronSon et al., 2014; Reddy, 2016; Blagrave & Santoro, 2017; Chistobaev et al., 2018; Bernardi 2019) have shown that there are various areas to focus on when examining labor force participation rate. For instance, the textile sector, life cycles, marital status, and the number of children (Dayıoğlu & Kirdar, 2010; Luque, 2013), labor market slack (AaronSon et al., 2014), age and cohort effect (Balleer, Gómez-Salvador & Turunen, 2009), health status (Cai, 2009), ageing (Reddy, 2016; Blagrave & Santoro, 2017), health expenditures, gross capital formation, mortality rate, secondary school enrolment, life expectancy (Mushtaq, Mohsin, & Zaman, 2013), structural transformation, education and real wage (Mehrotra & Parida, 2017), unemployment rate, gross domestic product per capita, fertility rate (Taşseven, Altaş, & Ün, 2016) and life expectancy (Rechel, Doyle, Grundy & McKee, 2009). Further to that, women-related issues can also contribute to an increase in labor force participation, for example, female education, sectoral employment share, unemployment rate, wages, marital status (Fatima & Sultana, 2009), poverty and women workers (Azid, Khan & Alamasi, 2010), and unemployment rate for females (Özerkek, 2014).

Several studies have empirically shown that many factors affect the labor force participation rate and most seem to come from the household perspective. In that regard, this paper aims to expand on that perspective by attempting to analyze three independent variables namely Gross Regional Domestic Product per capita at current prices, Male Life Expectancy, and the Number of Dependents.

2. Literature Review

The Labor-Leisure Choice Theory defines labor force participation as a function of real wage, working, and leisure. This implies that the allocation of working time is a function of the choice between working and leisure, and a function of increased real wage. In contrast, the Added Worker Theory argues that when recession causes husbands to be unemployed, other family members will enter the labor market thereby, producing an "added" number of labor force (Ehrenberg & Smith, 2012).

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Previous studies have investigated the labor force participation rate of females only, males only or both females and males together. From the female labor force perspective, Fatima and Sultana (2009) found that a higher rate of economic development increases female labor force participation. Women were taking full advantage of the opportunity by increasing their education level and this eventually reflects the U-shape relationship.

By using the non-linear maximum likelihood probability function, Azid, Khan, and Alamasi (2010) found that poverty determines female labor participation. Their results showed that poverty pushes the married women to participate in the labor market. In contrast, Dayıoğlu and Kırdar's (2010) household survey noted that the geographical shift of the rural population reduces female labor participation. Their findings suggest that rural women tend to migrate and this causes a reduction in female labor force participation rate. This, inevitably causes the part of the agricultural households in villages to decline.

Using the panel data analysis, Özerkek (2014) found a long-term relationship between female unemployment and labor force participation in European countries. The study revealed some aspect of the hidden female unemployment rate. The outcome may be attributed to the Turkish economic structure that was so highly dependent on imported raw materials and which offered low job opportunities. Taşseven, Altaş, and Ün (2016) also used the panel data analysis to identify female labor force participation in OECD countries. They found that unemployment rate, per capita gross domestic product, and fertility rate positively affect female labor force participation rate. The outcome was traced to the significant growth such as increased products exhibited by the observed countries. Deploying the household survey as their method, Mehrotraa and Paridab (2017) note that the structural transformation process of a nation can push a great number of women out of the agricultural sector by thrusting them into the manufacturing sector. Unfortunately, both the agricultural growth mechanism and the capital intensity of the manufacturing sector offer very limited opportunities to women. Consequently, this reduces female labor force participation rate substantially.

From the male labor force perspective, Blagrave and Santoro (2017) found that age is an important factor which can predict the decision to participate in the labor force, particularly for men. The cohort effect and the business cycle can also affect the decision to participate in labor force. Cai (2009) noted that health status can positively influence labor force participation for both men and women. His study also found that labor force participation can negatively affect men's health status but positively affect women's health status.

Using a cohort-based labor force participation model, Balleer, Gómez-Salvador, and Turunen (2009) was able to show that age and cohort can increase labor force participation rate in the Euro area. Using the autoregressive distributed lag, Mushtaq, Mohsin, and Zaman (2013) found that infant mortality rate, gross capital formation, and secondary school participation rate can reduce labor force participation rate, in the long run but health expenditure has a positive effect on the labor force participation rate, in the short run.

From the household perspective, Luque (2013) found that the demand factor (the presence of textile sector) and the supply factor (life cycle, marital status, and number of children) can determine labor force participation rate. However, in aggregate, the demand factor has the strongest effect. By using a probit regression model, Reddy (2016) showed that poor and old people were more likely to participate in the labor force, especially among those in the informal and low-wage sectors. A high proportion of elders who worked freelance or as entrepreneurs had indicated that an absence of pension funds had caused them to join the labor force.

Scholars and policy makers have been debating about the decreased labor force participation rate. Some proposed that weak labor demands suppress labor force participation rate but others proposed that structural forces of a nation, such as an aging population, can contribute to this phenomenon (Aaronson et al., 2014). It appears that the cyclical weakness, as indicated by labor market looseness, is more likely to explain the decrease better than the structural factors.

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Previous studies had exhibited varying results thus the following hypotheses were proposed:
H1: Gross regional domestic product per capita at current prices affects labor force participation rate.
H2: Male life expectancy affects labor force participation rate.
H3: The number of dependents affects labor force participation rate.

3. Reserch Methods

The panel data extracted for this study consists of two parts: (1) time series data and (2) cross section data. The former comprises the annual data of six years, from 2010 to 2015. The latter comprises data drawn from the Indonesian Central Bureau of Statistics (except for Northern Kalimantan and the Papua provinces).

This study used three independent variables to predict the Indonesian labor force participation rate: Gross Regional Domestic Product per capita at current prices, Male Life Expectancy, and the Number of Dependents. The Gross Regional Domestic Product per capita at the current price was measured by dividing the total gross regional domestic product with the number of population. The number of family members who are dependent on the family heads is the proxy for the Number of Dependents. Lastly, the average remaining life years of a man in certain years was used as the proxy for Male Life Expectancy. The dependent variable, labor force participation rate was measured as the ratio between population above 15 years old who had worked or searched for jobs with the total population that is above 15 years old.

This study uses panel data regression as the estimation technique. First, the best model was selected from between the Fixed Effect Model (FEM) and the Random Effect Model (REM). The Hausman test was then used to determine the model that is most appropriate for the data. The test indicates that the best model is the Fixed Effect Model and this is then used to test the three hypotheses. The calculation is as follows:

$$LFPR_{it} = a0 + a1GRDPCap_{it} + a2MLE_{it} + a3NoD_{it} + e_{it} \quad (1)$$

Where,

$LFPR_{it}$	: Labor Force Participation Rate of province i in year t
$GRDPCap_{it}$	: Gross Regional Domestic Product per capita at current prices of province i in year t
MLE_{it}	: Male Life Expectancy in province i year t
NoD_{it}	: Number of Dependents in province i year t
a_0	: Unobserved time-invariant individual effect
a_1, a_2, a_3	: Regression coefficients
e_{it}	: error term of province i in year t

This was followed by a subsequent step where the stationary panel data test was run on all the observed variables by using the Levin-Lin Chu (LLC) Unit Root Test method. If all the observed variables are stationary, then only can the FEM model be used to predict the hypothesis.

4. Results

In the initial stage, the Hausman Test statistics was compared with the probability value $\alpha = 5\%$ so as to determine the best model. If the probability value is less (more) than $\alpha = 5\%$, then the FEM (REM) would serve as the best model. This can be seen in Table 1 below.

Table 1. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.403323	3	0.0384

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Table 1 indicates that the best model is the Fixed Effect Model (FEM) because the Hausman Test statistics was 8.403323, with a probability of 0.0348, less than $\alpha = 5$ %. Before estimating the FEM, the time-series data were observed so as to ensure that the data were stationary and not containing any unit root. This can be seen in Table 2 below.

Table 2. Unit Root Test

Parameter	Hypotheses	P-Value	Conclusion
LFPR	Ho: Panels contain unit root	0.0000	I (0)
	Ha: Panels are stationary		
GRDPCap	Ho: Panels contain unit root	0.0000	I (0)
	Ha: Panels are stationary		
MLE	Ho: Panels contain unit root	0.0000	I (0)
	Ha: Panels are stationary		
NoD	Ho: Panels contain unit root	0.0000	I (0)
	Ha: Panels are stationary		

Table 2 indicates that the observed variables are stationary on the level integration degree (I_0) with a confidence level of 95%. This suggests that the data can be used for further analysis. Moreover, the panel dta regression results can be seen in Table 3.

Table 3. Fixed Effect Model

$LFPR_{it} = 77.03954 + 0.209761\ GRDPCap_{it} - 1.558982\ MLE_{it} - 6.171927\ NoD_{it}$			
[2.657311]	[4.569922]	[-3.404912]	[-0.430512]
R^2	: 0.927678		
F statistic	: 59.23105		
Durbin Watson Stat: 1.878282			

Table 3 indicates that the Gross Regional Domestic Product per capita at current prices positively affects the labor force participation rate. The results also showed that Male Life Expectancy has a negative influence on labor force participation rate. However, the number of dependents exhibited no significant effect on labor force participation rate.

5. Discussions

5.1 Gross regional domestic product per capita at current prices affects labor force participation rate

The estimation results gained through the Fixed Effect Model support the first hypothesis (H1). In the Indonesian context, increased income per capita at current prices generally increases labor force participation rate. The income per capita at current prices was used as the independent variable because in general, the Indonesian population spends more than sixty percent (60%) of their income on their primary needs namely, food and beverages, clothes, housing, health, and education. Expenditures for the primary needs were subject to inflation less. Table 4 shows the Gross Domestic Product at current prices, based on expenditure categories.

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Table 4. GDP at Current Prices based on Expenditure Categories (%) 2010 – 2016

No	Expenditure Categories	2010	2011	2012	2013	2014	2015	2016
1	Food and Beverage, non-Restaurant	38.5	38.5	38.9	38.5	38.0	38.5	39.2
2	Clothes, Footwear and Their Maintenance Services	4.1	4.1	3.9	3.8	3.7	3.7	3.6
3	Housing and Household Appliances	13.6	13.4	13.4	13.3	13.1	13.1	12.8
4	Health and Education	6.7	6.8	6.9	6.8	6.7	6.7	6.7
5	Transportation and Communication	23.6	23.3	22.8	23.4	24.0	23.3	22.8
6	Restaurant and Hotel	8.9	9.0	9.3	9.4	9.6	9.8	9.9
7	Others	4.5	4.8	4.9	4.8	4.8	4.9	4.9
	Total Household Consumption Expenditures	100	100	100	100	100	100	100

Source: Central Bureau of Statistics (2018b)

Besides the above, the Time Allocation theory can also be used to explain the effect of the income per capita at current prices on labor force participation rate. This theory assumes that workers either opt for working or for leisure. At certain income levels, these workers will decide on how to allocate their time into working or leisure. It appears that low-income individuals were more likely to have insufficient income to meet their needs thus it encourages family members who were previously not in the labor force to join the labor market (added worker theory). This can be seen in Figure 2 below.

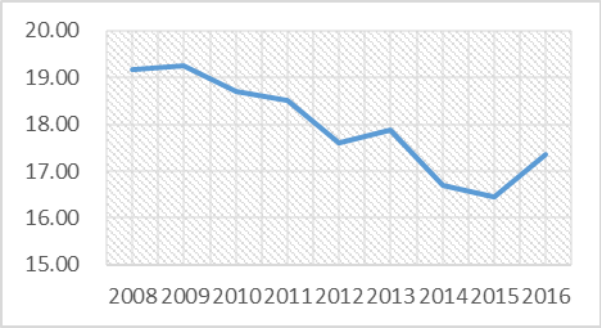

Figure 2. Population of 20 – 24 Years Old Who Look After Households
Source: Central Bureau of Statistics (2018d)

Figure 2 indicates that the number of those aged 20 – 24 years old who are not in the labor force (looking after households) had declined sharply during 2008-2016. These figures support the added worker theory which argues that low income encourages those previously not in the labor force, due to taking care of their households, to participate in the labor market so as to help their households meet their needs.

The Income per capita figure illustrates the ratio between the GDP and the number of population. The previous part of this paper had explained that the effect of income per capita on labor force participation depends on the income level. This implies that income distribution affects labor force participation rate. In the Indonesian context, the rural population exhibits a different Gini ratio pattern than the urban population. More specifically, the Gini ratio of the urban areas tends to be higher than that of the rural areas which tends to remain relatively constant. This can be seen in Figure 3 below.

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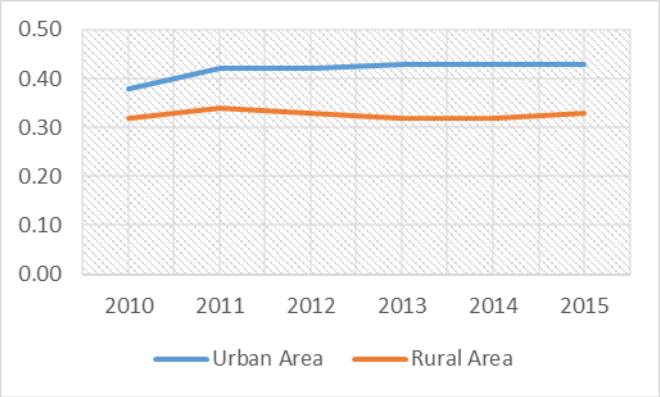

Figure 3. Comparison of Urban and Rural Gini Ratio
Source: Central Bureau of Statistics (2018a)

Figure 3 indicates that most of the Indonesian population live in the rural areas. The fact that the urban areas have a higher Gini index indicates that the largest proportion of the Indonesian population contributes to a smaller portion of the total GDP. In other words, the largest proportion of the Indonesian population are those from the rural areas with low income. In their study, Hubacek, Guan, and Barua (2007) argued that the economic success of several Asian developing countries had improved the quality of life for their population. It appears that majority of the population in these countries have undergone a transition, moving from poverty to sufficient fulfillment of their basic needs (e.g. foods, clothes). However, these people are not satisfied with only fulfilling their basic needs; they also wish to have a better life quality, such as highly nutritious food, better health care, more life comforts, and other life desires. Consequently, the relationship between the Gross Regional Domestic Product per capita at current prices and the labor force participation rate is positive.

5.2 Male life expectancy affects labor force participation rate

The test was applied by using the fixed effect model and the outcome supports the second hypothesis (H2) of this study. The fact that the Labor Force Participation Rate of the population aged 20-59 years old and those above 60 years old had increased. This suggests that a higher life expectancy increases labor force participation rate for these two age groups.

In the meantime, the Indonesian paternalistic culture which requires men to serve as family heads suggest that men enter the labor force. This factor confirms the current findings as the Indonesian quality of public health had equally increased (Ministry of Health, 2015). Central Bureau of Statistics (2018e) had reported that during the period of 2009 to 2015, the percentage of the population who have health complaints had decreased from 33.68 % to 30.35 %. This condition makes the population who are above 60 years old still able to participate in the labor market.

Relevant to this, Mustaq, Mohsin, and Zaman (2013) further proposed that well-managed health expenditure increases life expectancy at birth. Likewise, this will eventually increase labor force participation rate because people will have more years to enter the labor market.

In the Indonesian context, it appears that the Labor Force Participation Rate of the young population (those who are 15-19 years old) tends to decline. This suggests that most of the young population prefer to continue with their studies rather than enter the labor market. It also implies the success of the compulsory education program in Indonesia. This can be seen in Figure 4 below.

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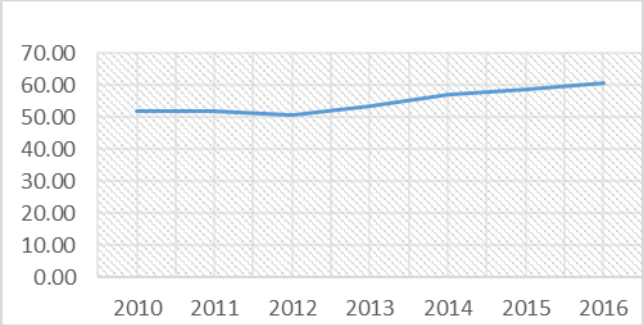

Figure 4. Population of 15-19 Years Old Who Continue Their Studies
Source: Central Bureau of Statistics (2018c)

In relation to these findings, Hipple (2016) had proposed that from 2000 to 2015, the younger population exhibit showed a decline in the labor force participation. The adolescents exhibited the largest decline in the labor force participation rate and this is possibly due to the increased school enrollment rate which implies that they prefer to continue their studies than to participate in the labor force. This can be seen in Figure 5 below.

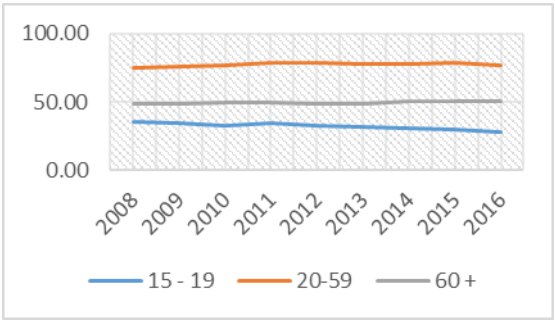

Figure 5. Labor Force Participation Rate by Age Group
Source: Central Bureau of Statistics (2018d)

Figure 5 indicates when the LFPR of the population aged 15-19 years old decreases because of the increased intention to continue with their studies, the LFPR of the population aged 20-59 years old and those above 60 years old increases. In sum, male life expectancy has a negative effect on labor force participation rate.

5.2 Number of dependents affects labor force participation rate

Using the fixed effect model, the test did not support the third hypothesis (H3). However, Mustaq, Mohsin, and Zaman (2013) stated that the number of dependents is a great impediment for growth and development. They proposed that governments reduce the number of dependents by providing old-age allowance to older workers and free educational and health facilities to the children.

Conclusions

This paper contributes to the empirical literature on the fact that low-income households constitute the largest proportion of the Indonesian population explains the positive relationship between the Gross Regional Domestic Product per capita at current prices and the labor force participation rate. However, Male Life Expectancy is negatively related to labor force participation because of the success of the compulsory education programs

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implemented by the government. Consequently, it is necessary for the Indonesian government to focus more on the low-income population and to simultaneously, increase the quality of public health.

While the unemployment rate has declined in recent years, labor force participation has also been declining, perhaps suggesting that unemployment is not as reliable an indicator of macroeconomic performance as it may have been in the past, but unemployment rate has positive relationship with female labor force participation established in few researches. The rise in labor force participation is often attributed in part to the maturing of the Baby Boom generation, as well as to the increase in the number of women in the workforce. The decline has often been attributed to the aging of the Indonesian labor force. A satisfactory model has to account for the rise and fall over many decades. The literature is not completely satisfactory, however, household decision making inside economic models. This would allow us to better understand what motivates or deters labor force participation.

References

Aaronson, S.; Cajner, T.; Fallick, B.; Galbis-Reig, F.; Smith, C.; & Wascher, W. (2014). Labor force participation: recent developments and future prospects. *Brookings Papers on Economic Activity*, *42*(2), 197-275. Retrieved from https://www.brookings.edu/wp-content/uploads/2016/07/Fall2014BPEA_Aaronson_et_al.pdf

Azid, T.; Ejaz Ali Khan, R.; & Alamasi, A. M. (2010). Labor force participation of married women in Punjab (Pakistan). *International Journal of Social Economics*, *37*(8), 592-612. Retrieved from https://doi.org/10.1108/03068291011060643

Bank of Indonesia. (2009). Laporan Tahunan Perekonomian. Retrieved from https://www.bi.go.id/id/publikasi/laporan-tahunan/perekonomian/Default.aspx

Balleer, A.; Gómez-Salvador, R.; & Turunen, J. (2009). Labour Force Participation in the Euro Area: A Cohort Based Analysis. In *Working Papers Series* (No. 1049). Retrieved from https://www.ecb.europa.eu//pub/pdf/scpwps/ecbwp1049.pdf

Bernardi, A. (2019). The capability approach and organizational climate as tools to study occupational health and safety. *Insights into Regional Development*, 1(2), 155-169. https://doi.org/10.9770/ird.2019.1.2(6)

Blagrave, P.; & Santoro, M. (2017). Labor Force Participation in Chile: Recent Trends, Drivers, and Prospects. In *IMF Working Paper* (No. 17/54). Retrieved from https://www.imf.org/en/Publications/WP/Issues/2017/03/13/Labor-Force-Participation-in-Chile-Recent-Trends-Drivers-and-Prospects-44741

Cai, L. (2010). The relationship between health and labour force participation: Evidence from a panel data simultaneous equation model. *Labour Economics*, *17*(1), 77-90. Retrieved from https://doi.org/10.1016/j.labeco.2009.04.001

Central Bureau of Statistics. (2018a). Kemiskinan dan Ketimpangan. Retrieved from https://www.bps.go.id/subject/23/kemiskinan-dan-ketimpangan.html#subjekViewTab6

Central Bureau of Statistics. (2018b). PDB Triwulanan Atas Dasar Harga Berlaku Menurut Pengeluaran (Miliar Rupiah), 2014-2018. Retrieved from Badan Pusat Statistik website: https://www.bps.go.id/dynamictable/2015/08/06/834/-seri-2010-pdb-triwulanan-atas-dasar-harga-berlaku-menurut-pengeluaran-miliar-rupiah-2014-2018-.html

Central Bureau of Statistics. (2018c). Pendidikan. Retrieved from https://www.bps.go.id/subject/28/pendidikan.html#subjekViewTab6

Central Bureau of Statistics. (2018d). Penduduk Berumur 15 Tahun Ke Atas Menurut Golongan Umur dan Jenis Kegiatan Selama Seminggu yang Lalu, 2008 - 2018. Retrieved from https://www.bps.go.id/statictable/2016/04/04/1904/penduduk-berumur-15-tahun-ke-atas-menurut-golongan-umur-dan-jenis-kegiatan-selama-seminggu-yang-lalu-2008---2018.html

Central Bureau of Statistics. (2018e). Persentase Penduduk yang Mempunyai Keluhan Kesehatan Selama Sebulan Terakhir menurut Provinsi, 2000-2017. Retrieved from https://www.bps.go.id/dynamictable/2015/09/19/921/persentase-penduduk-yang-mempunyai-keluhan-kesehatan-selama-sebulan-terakhir-menurut-provinsi-2000-2017.html

Chistobaev, A.I.; Semenova, A.Z.; Grudtsyn, N.A. (2018). Dynamics and strategic directions of public health preservation in Russian Federation. *Entrepreneurship and Sustainability Issues*, 6(3), 1180-1192. . http://doi.org/10.9770/jesi.2019.6.3(23)

Dayıoğlu, M.; & Kırdar, M. G. (2010). Determinants of and trends in labor force participation of women in Turkey. In Working Paper (No. 5). Retrieved from https://pdfs.semanticscholar.org/be5f/23b7c993fdd6a564947557a02a8a85da4ab1.pdf

Ehrenberg, R. G.; & Smith, R. S. (2012). *Modern labor economics: Theory and public policy* (11th ed.). Boston: Pearson Education. http://fac.ksu.edu.sa/sites/default/files/Modern_labor_economics__theory_and_public_policy_0.pdf

Fatima, A.; & Sultana, H. (2009). Tracing out the U-shape relationship between female labor force participation rate and economic development for Pakistan. *International Journal of Social Economics*, *36*(1/2), 182-198. Retrieved from https://doi.org/10.1108/03068290910921253

Hubacek, K.; Guan, D.; & Barua, A. (2007). Changing lifestyles and consumption patterns in developing countries: A scenario analysis for China and India. *Futures*, *39*(9), 1084-1096. Retrieved from https://core.ac.uk/download/pdf/51098.pdf

Luque, C. C. (2014). La tasa de actividad femenina a mediados del siglo XIX en Andalucía: el caso de Antequera. *Investigaciones de Historia Económica-Economic History Research*, *10*(3), 191-201. Retrieved from https://www.researchgate.net/profile/Maria_Nayra_Rodriguez_Rodriguez/publication/325570010_La_ensenanza_de_literatura_a_traves_de_las_infografias/links/5b167bef4585151f91fb8a3f/La-ensenanza-de-literatura-a-traves-de-las-infografias.pdf

McCulloch, N.; & Grover, A. (2010). Estimating the national impact of the financial crisis in Indonesia by combining a rapid qualitative study with nationally representative surveys. In *IDS Working Papers* (No. 346). Retrieved from https://assets.publishing.service.gov.uk/media/57a08b2a40f0b649740009e6/IndonesiaFinancialCrisispaperv7ST_1_.pdf

Mehrotra, S.; & Parida, J. K. (2017). Why is the Labour Force Participation of Women Declining in India? *World Development*, *98*, 360-380. Retrieved from https://doi.org/10.1016/j.worlddev.2017.05.003

Mushtaq, A.; Mohsin, A.; & Zaman, K. (2013). Effects of health on changing labor force participation in Pakistan. *Springer Plus*, *2*(1), 610. Retrieved from https://doi.org/10.1186/2193-1801-2-610

Özerkek, Y. (2014). Paid employment and growth in Turkey (1988-2013). *Journal of Economic and Administrative Sciences*, *36*(1), 215-227.

Reddy, A. B. (2016). Labour force participation of elderly in India: patterns and determinants. *International Journal of Social Economics*, *43*(5), 502-516. Retrieved from https://doi.org/10.1108/IJSE-11-2014-0221

SMERU. (2011). What is the Impact of the Global Financial Crisis for Workers: Flexibility and. Protection: A Case Study of the Utilization of Subcontract Workforce in Bekasi Indonesia. *The SMERU Research Institute*. Retrieved from http://smeru.or.id/en/report-types/research-report

Taşseven, Ö.; Altaş, D; & Turgut, Ü. N. (2016). The determinants of female labor force participation for OECD countries. *Uluslararası Ekonomik Araştırmalar Dergisi*, *2*(2), 27-38. Retrieved from http://hdl.handle.net/11376/2660

Ministry of Health. (2015). Rencana Strategis Kementerian Kesehatan Tahun 2015 - 2019. Retrieved from http://www.depkes.go.id/resources/download/info-publik/Renstra-2015.pdf

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MARKETING ANALYSIS OF THE MEDICAL REPRESENTATIVES' ACTIVITY AIMED ON INFORMATION SUPPORT FOR PROMOTED MEDICATIONS*

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Abstract. The purpose of the study was to analyze the medical representatives' activities aimed on information support for promoted medications. The assessment of the medical representatives' activity by doctors, pharmacists, and chemists was used to do so. The following methods of the study were used: comparative, structural and system analysis, as well as sociological methods of research (survey and interview). As a result of the study, it has been found that the activity of medical representatives is one of the main ways to obtain information about medications by medical or pharmaceutical workers, but the objectivity and completeness of the information received largely depends on the contact frequency and trust in the information materials provided. Following the results of the study, recommendations have been developed for improving the activities of medical representatives and their interaction with pharmaceutical organizations and doctors.

Keywords: medical representative; pharmacist; doctor; pharmacy; contact frequency; information; objectivity

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1. Introduction

A wide range of medications presented on the Russian pharmaceutical market today necessitates objective information about them for pharmaceutical specialists. Medical representatives of pharmaceutical companies play an important role in information support for medications.

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A medical representative is either a full-time employee of a pharmaceutical company or an employee voluntarily engaged in the company's activities, who visits medical and pharmaceutical organizations to directly promote medications (Cubic & Shaffer 2017; Androniceanu, 2017).

The medical representatives' activities should be considered in the context of the sociology of medicine (Salmasi et al. 2016), organization of pharmaceutical business (Lueckmann et al. 2009; Horodnic et al., 2018), pharmaceutical business and pharmaceutical market (Shang & Shi 1999; Sierles et al. 2009), psychology (Assari 2017), and professional training for pharmaceutical specialists (Sobowale et al. 2018).

It is important to note that pharmaceutical companies are always initiators and sponsors of the medicine development, influencing the development of medicine and pharmaceuticals worldwide, contributing to the expansion of medical knowledge in the scientific community, and improving the efficiency of diagnostics and treatment, which improves the healthcare quality. In this case, medical representatives are the main communicators from companies.

It can be assumed that the profession of a medical representative developed in line with the profession of a doctor while stimulating this process. This is because pharmaceutical companies conduct intensive research into various diseases and medicine development, while medical representatives communicate information about them to practitioners (ILO maritime labour Conventions and Recommendations 2008).

The above aspects determine the relevance of the research of medical representatives' activities from the standpoint of providing information about medicines to direct partners and customers: pharmacists and chemists.

The activities of medical representatives in Russia have become especially important now due to the Presidential Decree "On the national goals and strategic objectives of the Russian Federation development through to 2024" and the implementation of the sustainable development strategy "Russia 2024" (Eskindarov et al. 2017). Priorities in healthcare were identified in the strategy for sustainable development of Russia – in particular, increasing the personal responsibility of citizens for their health, ensuring the free choice of healthcare providers of appropriate quality, providing targeted assistance to the most socially vulnerable groups of the population, and creating a business-friendly environment in the healthcare market. It must be noted that the European Union's Health 2020: a European Policy Framework Supporting Action Across Government and Society for Health and Well-Being became a guideline (Health 2020). One of the directions in addressing the healthcare priorities is to increase the role of medical representatives in the medicine promotion, securing the quality, impartiality and reliability of pharmaceutical information sources.

The purpose of this article is to analyze the activities of medical representatives to provide information support to promoted medications – from the standpoint of assessment by their counterparties (doctors, pharmacists, and chemists).

2. Materials and Methods

The survey method was used as the main method of researching the activities of medical representatives in order to provide information support to promoted medications, where 266 the respondents from 21 constituent entities of the Russian Federation participated. The research review included doctors, pharmacists, and chemists from 174 economic agents of various forms of incorporation.

The deterministic quota method was used for sampling. The following parameters were monitored in the study: employment history, position, and age. The field phase of the study was conducted in 2017 – 2018 through a

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personal oral survey using a structured questionnaire. The questionnaire included questions relating to personal characteristics of the respondents, assessment of their needs for obtaining information about medicines from medical representatives, as well as an analysis of the level of satisfaction with the medical representatives' activities.

3. Results

When assessing the frequency of the medical representatives' visits to pharmacies, it was found that their level was 1–5 times a week in most cases (cumulative share of the respondents was 70%). Only 19.2% of the respondents noted the level of the medical representatives' visits to their institutions as 6–10 times a week. The smaller number of the respondents (10.8%) indicated more frequent visits (Figure 1).

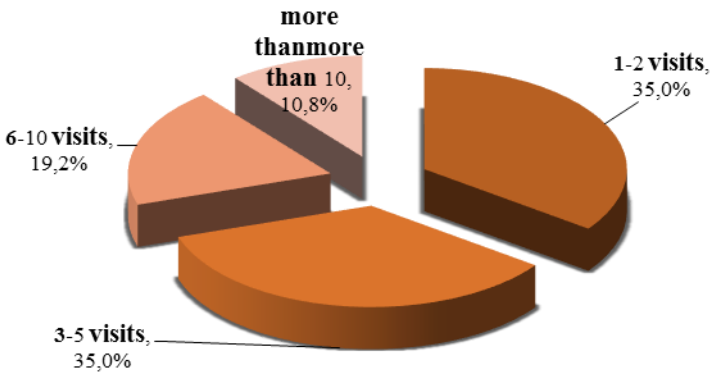

Fig.1. Frequency of medical representatives' visits to pharmacies (per week)

The authors believe that the provided data are more dependent on the geographical location of the pharmacy and its level of importance for the pharmaceutical company. It is known that there is a certain rating of pharmacies for the business potential among medical representatives:

– Category 1: large pharmacies (and chains) with high turnover, which promptly pay their invoices;
– Category 2: medium-sized pharmacies with high potential for sales growth, paying invoices in a timely manner or with a slight delay; and
– Category 3: small pharmacies or state-owned pharmacies that serve mainly low-income consumers and allowing frequent delays in payment of invoices.

Undoubtedly, the frequency of the medical representatives' visits to pharmacies largely depends on the pharmacy rating: Categories 1 and 2 attract the attention of medical representatives much more often than pharmacies from Category 3. The medical representatives most frequently visit the most successful and solvent pharmacies (6 or more times per week make up a cumulative share of 30%). There are "supporting" contacts (1–2 times a week) with a medical representative in one case out of three (35% of the respondents). As such, it can be argued that there is a direct connection between the number of medical representative's contacts and the rating/category of the pharmacy.

The degree of trust in medical representatives and the information they provide is an important factor in their performance. Studies reveal that employees of pharmaceutical organizations often have a negative attitude to medical representatives due to the insufficient quality of the information provided. At the same time, medical representatives often do not disclose full information about side effects of medications, omit (or intentionally

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reduce) information about contraindications of medications or allow incomplete presentation of other information about medications, mainly emphasizing its advantages without mentioning the possible risk of use (Walker & Druss 2015).

As such, the next stage of the study was to assess the degree of confidence in the information provided by medical representatives among pharmacists and chemists (Figure 2). The results revealed that only 6.7% of the respondents fully trusted the information materials provided by medical representatives. Seven two point four percent of the respondents could trust information only after its verification. Another 20.9% of the respondents noted that they did not always and fully trust the information provided by medical representatives about a particular product.

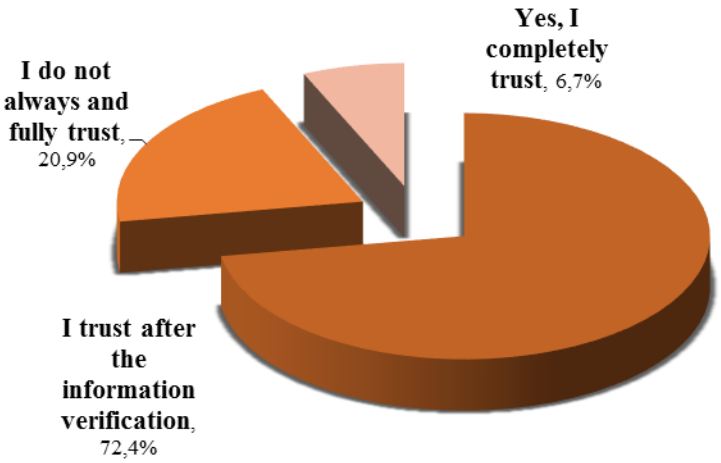

Fig.2. Assessment of the degree of trust in the information received from medical representatives by the respondents

It was established in the course of the study and interviews that pharmaceutical companies used both individual and collective forms of interaction between their medical representatives and representatives of pharmaceutical organizations and doctors in their activities. Individual meetings were used in almost half of the cases, while the remaining contacts provided for a collective approach and were hold as various seminars, round tables, and presentations.

The survey found that a certain form of interaction between medical representatives and pharmacists/chemists/doctors did not have significant impact on the recall rate for specific medication and their manufacturers. For example, regardless of the communication format, less than 40% of the respondents were able to recall which medical representatives visited them during the analyzed period. Meanwhile, the majority of the respondents recalled visits of medical representatives only from the interviewer's prompts. Given this fact, it can be assumed that the knowledge of pharmacists/chemists/doctors about medications promoted to the market by pharmaceutical companies is at the level of about 60%.

This was also confirmed by the results of the respondents' answers to the question: "Name the company whose medical representatives represented broad-spectrum antibiotics" (Figure 3).

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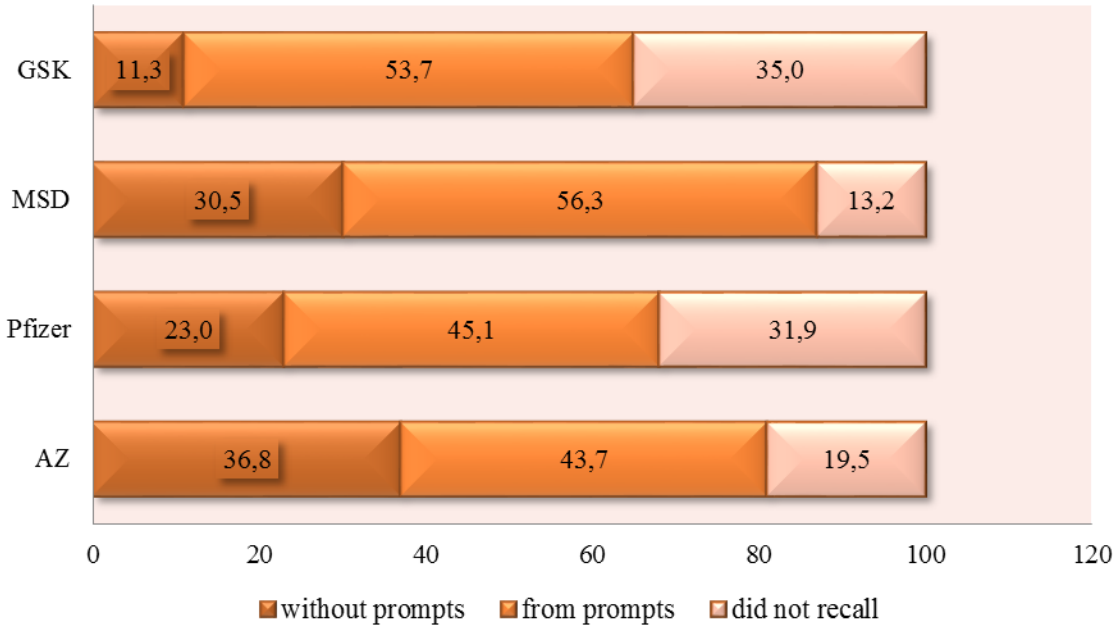

Fig.3. Recall rate by pharmacists and chemists of information on broad-spectrum antibiotics provided by medical representatives (%)

The information presented in the figure allows to conclude that the respondents best recalled visits of Merck Sharp & Dohme (MSD) employees, as mentioned by about 87% of pharmaceutical employees (30.5% of the respondents answered without prompts, and 56.3% – from interviewer's prompts). Only 13.2% of the respondents could not recall the visits of MSD representatives, which was the best result among the largest pharmaceutical companies mentioned in the survey. This indicates the prominence of MSD among pharmacists and indirectly reflects the significant number and frequent visits of MSD medical representatives to pharmacies.

More than 80% of the respondents recalled the meetings with medical representatives from AstraZeneca (AZ) devoted to broad-spectrum antibiotics (36.8% of the respondents answered without prompts, which was the best result among the largest pharmaceutical companies mentioned in the survey; and 43.7% answered from interviewer's prompts). At the same time, almost every fifth respondent could not recall information about broad-spectrum antibiotics, which had been explained by AZ representatives during the meeting.

Lower results of recall rate of information explained by medical representatives were noted by the respondents in the case of Pfizer – only 23% of the respondents recalled it without prompts. A significant part of the respondents (45.1%) did this with the help of an interviewer, and almost a third of the respondents (31.9%) could not recall the information explained by medical representatives of Pfizer, which indicated low efficiency of contact.

The worst results among the large pharmaceutical companies on the market for broad-spectrum antibiotics were obtained for representatives of GlaxoSmithKline (GSK) – 35% of the respondents could not recall the information or the representative's visit, and only 11.3% of the respondents had steady memorization (the lowest result among the companies mentioned in the survey). More than half of the respondents (53.7%) recalled the visit of a medical representative or a presentation and explained information about broad-spectrum antibiotics with the help of an interviewer. This is due to the fame of GSK in the Russian market and among pharmacists.

Higher results in the recall rate for visits and conversations were demonstrated by medical representatives of Eli Lilly and Janssen-Cilag, who promoted medications for the treatment of mental illness. Ninety three percent of

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the respondents recalled them during the survey of psychiatrists of medical institutions in 8 cities of Russia. A little worse result of the visit recall rate and information of medical representatives was obtained for Astrazenica – 83% of the respondents (Figure 4).

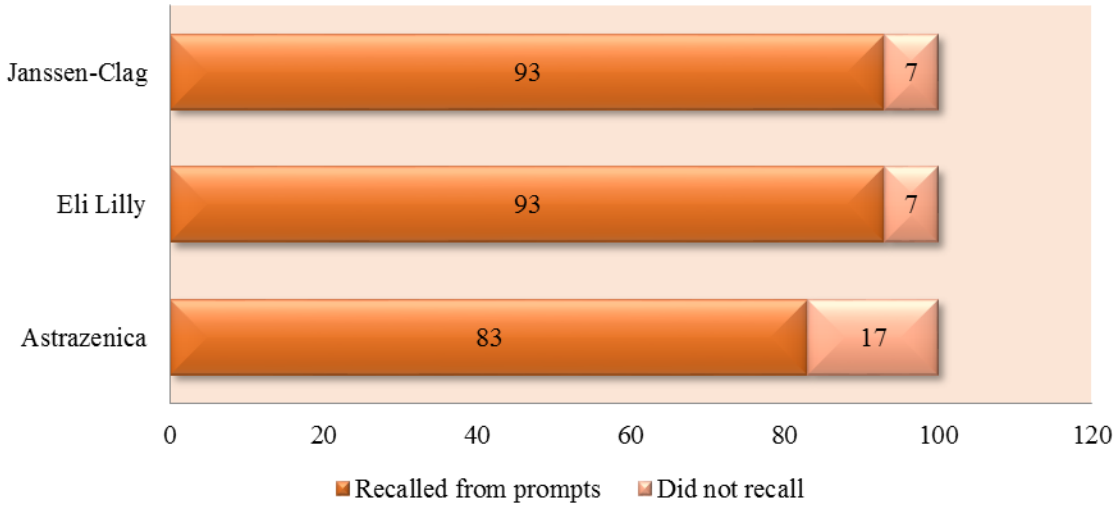

Fig.4. Recall rate for medical representatives of companies promoting medications for the treatment of mental illness by doctors

The recall rate for visits by medical representatives of the companies promoting medications for the treatment of mental illness can be better than for those promoting broad-spectrum antibiotics due to the following:

1) personal contacts with doctors (who directly use medications in their medical practice and rehabilitation) rather than with pharmacists (who act only as intermediaries between pharmaceutical companies and medical institutions/patients in this case);
2) special conditions for the use of medical items for the treatment of mental illness that are restricted and not used by a wide range of consumers; and
3) a limited number of manufacturers and pharmaceutical companies specializing in the production and promotion of medical items for the treatment of mental illness, compared with broad-spectrum antibiotics.

It must be recognized that the recall rate for visits and presentation of medical representatives, as well as information about medications promoted by them, are undoubtedly influenced by the frequency and regularity of communications, due to which the interval between regular visits of medical representatives of a particular pharmaceutical company does not usually exceed one month. However, even with such an interaction schedule, the respondents recalled on average only 40–60% of the meetings with medical representatives during a calendar month. Moreover, it was found during the survey that a significant number of the respondents (about 25%) noted no visits from representatives of some pharmaceutical companies over 6 months.

The results of establishing the visits' frequency of medical representatives promoting medications for the treatment of cardiovascular diseases are of particular interest (Figure 5).

According to the respondents participating in a study on the promotion of medications for the treatment of cardiovascular diseases, representatives of Pharmacia were the most active in the preceding month – about 61% of the respondents recalled their visits and presentations, while 11% recalled them with the help of an interviewer.

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However, even in this situation, more than a quarter of the respondents indicated no contact with a medical representative for more than 6 months.

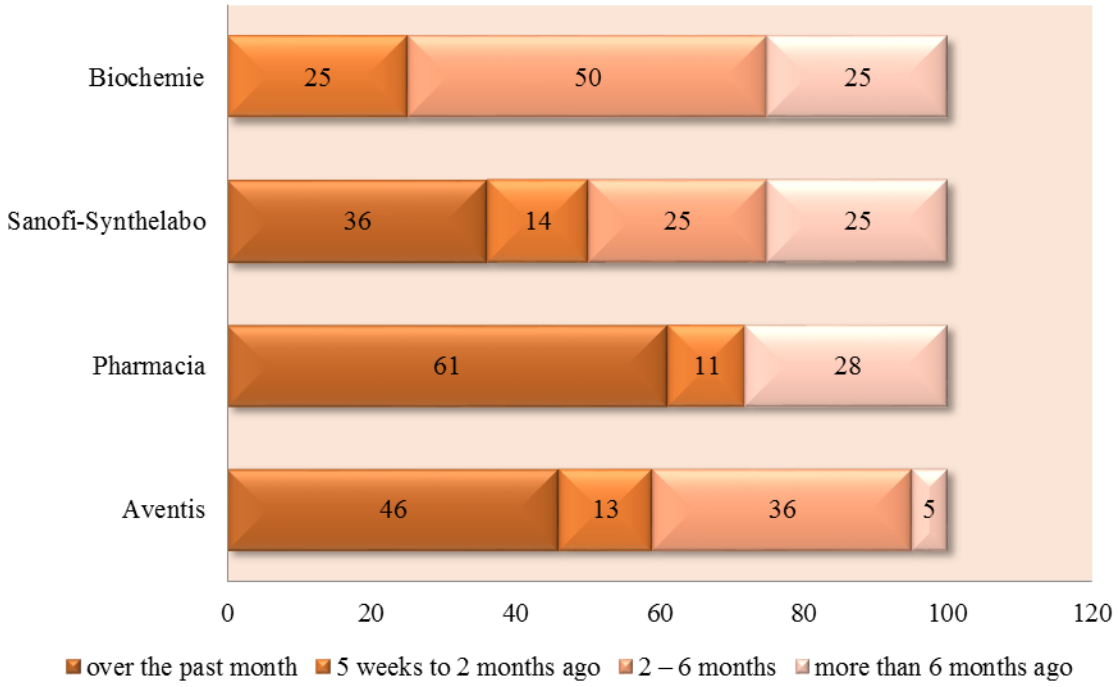

Fig.5. Visits' frequency for medical representatives promoting medications for the treatment of cardiovascular diseases

According to the survey results, the Aventis medical representatives were the most active: almost half (46%) of the visits were made over the past month, another 49% of the visits were from 5 weeks to 2 months ago. Only 5% of the respondents noted that Aventis medical representatives had visited them more than 6 months ago (this was the best result among the companies mentioned in the survey).

According to the respondents, a quarter of the visits and presentations were made more than 6 months ago by representatives of Biochemie and Sanofi Synthelabo. The former company had a quarter of contacts with medical representatives from 5 weeks to 2 months ago, and the main part (50%) of them was from 2 to 6 months ago. Biochemie was the only company whose contacts were not made (according to the respondents) during the month preceding the survey.

The respondents recalled the representatives of Sanofi Synthelabo by their visits during the past month (36%), from 5 weeks to 2 months ago (14%), but half of the contacts was 2–6 months ago and earlier.

During the survey, it was found that medical representatives of companies promoting medications for the treatment of mental illness visited hospitals quite regularly – during the previous month, there had been at least one visit of Janssen-Cilag and Eli Lilly employees in about 90% cases, as well as 73% of the visits by AstraZeneca representatives.

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Discussion

A large number of ethical restrictions that exist both at the national and at the international level are the peculiarity of the modern pharmaceutical market. The WHO recommends regulating medications advertising by encouraging states to develop recommendations for market promotion of the medication that are in line with national health policies, and to promote rational use of the medication.

The WHO issued the Recommendations on the Ethical Promotion of Medications as an example of such recommendations. There is also the Association of International Pharmaceutical Manufacturers (AIRM), which annually publishes its "Code on Promotion of Medications". A large number of pharmaceutical companies proclaim their commitment to ethical operation, relying on the preservation of their reputation and do not offer consumers products the effectiveness of which has not been confirmed by scientific research, but, unfortunately, other examples also exist (Yamamoto & Fushimi 2009; Panfiluk & Szymańska 2017).

The world practice indicates that the assessment of objectivity and reliability of information associated with pharmacotherapy, prescription of medicines from the standpoint of evidence-based medicine, have always been discussed by many scientists and practitioners (Veelo et al. 2006). The objectivity of information on pharmacotherapy had been assessed by experts in evidence-based medicine, which allowed to determine criteria for evaluating a pharmaceutical company, through which experts could determine the quality, reliability, and usefulness of information provided to a medical representative, such as (Schmitz & Kruse 2002):

– importance of the medication for clinical practice;
– availability of studies on the effectiveness of medicines in the leading professional journals;
– availability of highly reliable evidence (regular reviews, meta-analysis, double blind randomized controlling studies);
– breadth of the evidence, which allows to assess the safety, effectiveness, and cost of treatment;
– certainty of improvement in the living standards during the use of a particular medication;
– availability of application of indirect assessment criteria;
– clinical significance of the pharmacotherapy results; and
– availability of articles that contain the weightiest evidence of statements in the printed materials submitted by pharmaceutical companies.

It is important to note that contacts with medical representatives can also be negative: be intrusive or provide biased information. This is why programs are being adopted to protect pharmacists and doctors from the negative effects of communication in some countries, and behavior recommendations are being developed regarding the communication with representatives of pharmaceutical companies. The key recommendations include the following:
– active role of doctors and pharmacists in cooperation with medical representatives, which consists in compulsory questions regarding contraindications, adverse effects, and price of the medication represented;
– mandatory comparison of the materials provided by the medical representative with objective sources of information;
– mandatory provision of scientific information on the properties of medicines; and
– refusing free samples of medicines and other forms of attention from pharmaceutical companies.

It is important to note that one of the directions for reforming the pharmaceutical industry in Russia is the transition to the standards of proper practices in relation to the activities of pharmacies – the introduction of the Proper Pharmacy Practice (PPP). In accordance with the provisions of the standards, all processes and general activities of pharmacies should be documented.

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Conclusions

Following the results of the study, it has been found that the activity of medical representatives is one of the main ways to obtain information about medications and drugs by medical or pharmaceutical representatives today, but the objectivity and completeness of information received from a medical representative largely depend on the contact frequency and trust in the information materials provided by medical representatives.

A questionnaire survey allowed to define the frequency of visits of medical representatives to pharmacies: 1–5 times a week in 70% of cases. At the same time, an assessment of trust in the information materials provided to the medical representative indicates that only 6.7% of the respondents completely trust it, and 72.4% of the respondents intend to check this information.

The results of the study indicate that the cooperation between pharmacies' employees and medical representatives is largely not regular today on the part of pharmacies. There are also no regulatory legal acts at the state level to regulate the activities of medical representatives, and this complicates the work of both representatives and employees of pharmacy institutions.

The global practice of regulating information about medications and the formation of national policies require to define a responsible regulator, whose authority should include the creation of an efficient system of interaction between medical representatives and other specialists. This is why it seems expedient to create a nongovernmental organization in the Russian Federation that could unite players on the pharmaceutical market, conduct market and interaction analysis, and produce recommendations that could be adopted at the state level.

According to the PPP concept and ideology, any activity in the pharmacy should be documented. To comply with this provision, it is advisable to introduce a person responsible for cooperating with medical representatives, implementing and maintaining the register of medical representatives' visits to the pharmacy. This will allow tracking contacts with representatives of medical and pharmaceutical companies and their main results, and systematize the interaction of counterparties.

References

Androniceanu, A. (2017). Hospital management based on the relationship between doctors and patients. *Administratie si Management Public* (29): 41-53.

Assari, S. (2017). Number of Chronic Medical Conditions Fully Mediates the Effects of Race on Mortality; 25-Year Follow-Up of a Nationally Representative Sample of Americans. *J Racial Ethn Heal Disparities* 4(4): 623-631. https://doi.org/10.1007/s40615-016-0266-4

Cubic, B.A.; & Shaffer, L.A. (2017). Academic Health Center Psychology Representation to the Council of Faculty and Academic Societies (CFAS) of the Association of American Medical Colleges (AAMC). *J Clin Psychol Med Settings* 24(2): 124-131. https://doi.org/10.1007/s10880-017-9500-4

Eskindarov, M.A.; Maslennikov, V.V.; Abramova, M.A.; Lavrushin, O.I.; Goncharenko, L.I.; Solyannikova, S.P.; Abdikeev, N.M.; & Morkovkin, D.E. (2017). The CSR Strategy for 2018–2024: Slogans, Myths and Reality (Expert Opinion of Financial University). *Bulletin of The Financial University* 21(3): 6-24. https://doi.org/10.26794/2587-5671-2017-21-3-6-24

Health (2020). Retrieved August 18, 2018 from www.ndphs.org/documents/3239/NCD_5_6_3-Info_2_rus__Health_2020_WHO-EURO_short.pdf

Horodnic, A.; Brock, G.; Cristian Incaltarau, C. (2018). Transition and Mortality Impact in Post-Communist Romania. *Transformations in Business & Economics* 17(1-43), 21-37.

ILO maritime labour Conventions and Recommendations. (2008). In: Maritime Work Law Fundamentals: Responsible Shipowners, Reliable Seafarers. Berlin, Heidelberg: Springer Berlin Heidelberg, 9: 415. https://doi.org/10.1007/978-3-540-72751-4_2

Lueckmann, S.L.; Behmann, M.; Bisson, S.; & Schneider, N. (2009). Good idea but not feasible – the views of decision makers and stakeholders towards strategies for better palliative care in Germany: a representative survey. *BMC Palliat Care* 8(1): 10 https://doi.org/10.1186/1472-684X-8-10

Panfiluk, E.; Szymańska, E. (2017). The measurement of the innovativeness of health tourism services using an adequacy matrix title of the article. *Entrepreneurship and Sustainability Issues* 4(4): 400-420. http://doi.org/10.9770/jesi.2017.4.4(1)

Salmasi S.; Ming L.C.; & Khan T.M. (2016). Interaction and medical inducement between pharmaceutical representatives and physicians: a meta-synthesis. *J Pharm Policy Pract* 9(1): 37. https://doi.org/10.1186/s40545-016-0089-z

Schmitz, N.; & Kruse, J. (2002). The relationship between mental disorders and medical service utilization in a representative community sample. *Soc Psychiatry Psychiatr Epidemiol*. 37(8): 380-386. https://doi.org/10.1007/s00127-002-0567-2

Shang, Y.; & Shi, H. (1999). A Web based multi agent system for interpreting medical images. *World Wide Web* 2(4): 209-218. https://doi.org/10.1023/A:1019261025204

Sierles, F.; Brodkey, A.; Cleary, L.; McCurdy, F.A.; Mintz, M.; Frank, J.; Lynn, D.J.; Chao, J.; Morgenstern, B.; Shore, W.; Woodard, J. (2009). Relationships Between Drug Company Representatives and Medical Students: Medical School Policies and Attitudes of Student Affairs Deans and Third-Year Medical Students. *Acad Psychiatry* 33(6): 478-483. https://doi.org/10.1176/appi.ap.33.6.478

Sobowale, K.; Ham, S.A.; Curlin, F.A.; & Yoon, J.D. (2018). Personality Traits Are Associated with Academic Achievement in Medical School: A Nationally Representative Study. *Acad Psychiatry* 42(3): 338-345. https://doi.org/10.1007/s40596-017-0766-5

Veelo, D.P.; Spronk, P.E.; Kuiper, M.A.; Korevaar, J.C.; van der Voort, P.H.J.; & Schultz, M.J. (2006). A change in the Dutch Directive on Medical Research Involving Human Subjects strongly increases the number of eligible intensive care patients: an observational study. *Intensive Care Med*. 32(11): 1845-1850. https://doi.org/10.1007/s00134-006-0384-2

Walker, E.R.; & Druss, B.G. (2015). Rate and Predictors of Persistent Major Depressive Disorder in a Nationally Representative Sample. *Community Ment Health J*. 51(6): 701-707. https://doi.org/10.1007/s10597-014-9793-9

Yamamoto, K.; & Fushimi, K. (2009). Travel of patients to distant hospitals for elective surgery in Japan: A cross-sectional analysis of a nationally representative sample. *Surg Today* 39(9): 758-763. https://doi.org/10.1007/s00595-009-3991-z

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THE IMPLEMENTATION OF GOOD CORPORATE GOVERNANCE MODEL AND AUDITOR INDEPENDENCE IN EARNINGS' QUALITY IMPROVEMENT

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Abstract. The general objective of this research is to explore the model of earnings quality monitoring and to examine the effect of auditor independence on the relationship between *corporate governance* mechanism and earnings quality. Specifically, this research is aimed to investigate the impact of ownership structure, commissioner board structure, audit committee structure, internal audit function, and internal control activity, on earnings quality by involving an interaction of these variables with auditor independence. Earnings quality is measured with two proxies. The first proxy is *performance-adjusted discretionary accruals* or also called *Total Accrual*, while the second utilizes *Total Current Accrual*. Achieving all objectives above, the author develops a model and analyses this model in two stages. In the first stage, the model is explored using analysis technique of correlation and regression. Second, fittingness of model is attested using regression analysis with a variety of variable controls and sample controls. Research object is the manufacture companies listed in Indonesia Stock Exchange in period 2011-2015. The Sample includes 112 companies with 560 data of research. After conducting outlier test, the suitable amount of data is 553. The Result of hypothesis test indicates that the model of earnings quality monitoring is constructed from the interaction of many variables. *Corporate governance* mechanism consists of variables such as ownership structure (managerial ownership and institutional ownership), commissioner board structure, audit committee structure, internal audit function, and internal control activity. Adjusted R-Square value is reaching for 3.3% with significance-value of 0.001. Partially, commissioner board structure, internal audit function, and internal control activity have a significant effect on earnings quality. Auditor independence does not moderate the impact of *corporate governance* components on earnings quality.

Keywords: auditor independence; corporate governance; discretionary accrual; earnings quality

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1. Introduction

Profit and Loss Statement is a structure to communicate financial information to the relevant parties out of the company. The primary focus of this statement is information about company performance, and this performance is known by measuring income and its components. Investors, creditors, and other parties with interest in assessing incoming cash-flow would have great necessity on information about company performance (Mulford & Eugene, 2010; Masiulevičius & Lakis, 2018).

Some parties may already be informed over others about company condition, but such information usually does not match with the real situation of the company. Management (agent) is a party with a responsibility to manage all resources available in the company. Therefore, agent must know more about the company than the owner (principal) or other stakeholders. The owner always gets information from the report made by the agency. This relationship leads to a situation called information asymmetry. Imparity situation and the potential conflict of interest between company management and financial information user can be avoided by using a third party (neutral) to audit earnings-loss statement to improve the quality of financial information given by management (Sumarwoto, 2006). The study can contribute to the understanding of the effect of auditor independence on a relationship between governance mechanism and earnings quality in a particular agency setting. They might be of interest to practitioners and regulators, as they are consistent with calls for more earnings quality requirements in this agency setting (Allegrini, 2013).

Audit Standard has required an auditor to discuss and communicate with audit committee about the desired earnings quality. This effort would reduce the possibility of opportunistic earnings management and also of material misrepresentation. Role of the auditor on earnings quality would be more meaningful if the auditor is independent. People trust given to auditor's verification of an earnings-loss statement is determined by auditor's competence and independence (Watt & Zimmennan, 1986; Tarasova et al., 2018). According to Marra, A., Mazzola, P. and Prencipe, A. (2011) board independence and audit committees play an important and effective role in reducing earnings management after the introduction of IFRS.

Empirical evidence shows that the application of *corporate governance* is related more to company performance and less with earnings quality. If any connections whatsoever, the relationship is not consistent (Larcker et al., 2007; GMI, 2005). The role of the auditor and internal control and the effect of both on earnings quality are also far from being clear (Hoitash et al., 2009; Lin et al., 2011). Based on the review of previous studies, two “gaps” are found. First is the debate on the direct effect of *corporate governance* on earnings quality. Second, some researches still examines the object partially, such as *corporate governance* and stock return (Brown & Caylor, 2004; Larcker et al., 2007); *corporate governance* and internal control (Jenning et al., 2006; Bedard & Graham, 2008; Hoitash et al., 2009; Nagy, 2010); *corporate governance* and earnings quality (Larcker et al., 2007); auditor and earnings management (Teoh & Wong, 1993; Francis & Yu, 2009); auditor and audit quality (Abbott et al., 2007; Francis & Yu, 2009); auditor and earnings quality (Jerry & Mark, 2010; Lin et al., 2011); auditor and internal audit (Bedard & Graham, 2008); and internal audit and internal control (Lin et al., 2011). All researchers above do not comprehensively investigate the role played by ownership structure, internal audit function, internal control activity, and auditor independence in the model of earnings quality monitoring. Therefore, the formulated problem in this research would be, "How shall be the fittest model that describes the role of *corporate governance* mechanism, ownership structure, internal audit function, internal control activity, and auditor independence in earnings quality monitoring?”

The general objective of this research is to explore the model of earnings quality monitoring and to examine the effect of auditor independence on a relationship between *corporate governance* mechanism and earnings quality. The specific objective of this research is to investigate the effect of ownership structure, commissioner board

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structure, audit committee structure, internal audit function, and internal control activity, on earnings quality by using auditor independence as moderating variable.

Financial statement (earnings-loss) can be used as a structure for monitoring the contract between *agent* and *principal*. This statement is useful not only for agent and principal, but also for other users including investors, creditors, employees, customers, governments, and communities (IAI, 2015). The financial statement shall contain reliable information which then is used as the base in making an economic decision. Therefore, such statement must have what so-called qualitative characteristic.

During a condition of uncertainty, the financial statement in desired quality can reduce information asymmetry in agency contract involving agent and principal, or also in the relationship between agent and other stakeholders. Indeed, information asymmetry brings a risk of poor decision-making on economic issues. According to Scott (2003)**,** the risk of information asymmetry is caused by two factors, respectively *adverse selection*, and *moral hazard*. The proof that *moral hazard* exists can be detected from the presence of *earnings management* done by *the agent* or from the relationship between agent and principal which harms the user of the financial statement. The presence of *earnings management* would provide great indication of lower earnings quality.

Earnings management is an option made by the manager when they are making policy or selecting accounting method, but this option would impact on earnings or also on the achievement of specific goals of the managerial statement (Scott, 2003). Empirically, earnings quality can be measured by the presence of *earnings management*. Feng, Kristian, Qinytuan, & Xin (2011) have used three proxies in estimating earnings quality. The first proxy is *performance-adjusted discretionary accruals* developed by Kothari, Leone, & Wasley (2005). The second is *discretionary revenues*, a model made by McNichols & Stubben (2008) and Stubben (2010). The third proxy is a model constructed by Dechow & Dichev (2002) as modified by Francis et al., (2005). Based on the results of some previous studies, it is indicated that earnings quality is affected by some factors. These factors are: the application of *corporate governance* (Larcker et.al., 2007; GMI, 2005; Jennings et. al., 2006), the involvement of high-quality auditors (Francis & Yu, 2009; Teoh & Wong, 1993; Abbott et.al., 2007), internal audit function and internal control activity (Nagy, 2010) and auditor independence (Watt & Zimmerman, 1986; Scott & Marshall, 2001). Earnings accuracy is one of the key factors affecting a firm's sustainability in the sense that reported earnings provide information about a firm's long-term sustainability and further are directly associated with a firm's cost of capital (Shin, 2019).

Corporate governance mechanism is needed to ensure that company has performed well, went in the right direction, and been managed without abuse. *Corporate governance* has once been public attention when the public start to learn the financial crisis suffered by East Asia countries and the fall of Enron and WorldCom (Pirzada, 2013). *Good Corporate governance* becomes then a robust regulation model in the financial market (Anuchitworawong, 2010). The presence of *good corporate governance* (GCG) is absolutely required by an organization, considering GCG requires a good governance system which can assist in building shareholder confidence and ensure that all stakeholders are treated equally. A good system will provide effective protection to shareholders to recover their investment reasonably, appropriately and efficiently, and ensure that management acts for the benefit of the company (Mahrani, 2018)

Most regulations and corporate governance codes emphasize the adjective independent next to the words auditor because auditor independence is expected to result in better protection for shareholders and other stakeholders (Ianniello, 2015). Based on Watt & Zimmennan (1986) view of auditor independence has perceived that people trust to verification given by the auditor on the earnings-loss statement is determined by auditor's competence and independence. Auditor competence is concerning with professional reliability of auditor individual. It requires the auditor to have a technical skill which enables the auditor to always keep on track the violation of the existing

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accounting system. Meanwhile, auditor independence involves auditor to have less-biased perceptions of any things related to audit results by Solikhah, Firmansyah & Pirzada, (2017). Independent auditor shall be the protector of the empowering accounting practices because auditor is not only considered as having a profound knowledge in accounting field but also perceived as having close relationship with anyone in audit committee and director board who are responsible for checking up the activity of the decision-makers in the company (Scott & Marshall, 2001).

Based on theories previously elaborated and the findings of previous studies, then the hypothesis of research is developed (Pirzada, 2015), and it can be described as follows.

- Managerial Ownership, Institutional Ownership, Commissioner Board Structure, Audit Committee Structure, Internal Audit Function, and Internal Control Activity, affect Earnings Quality.
- Managerial Ownership, Institutional Ownership, Commissioner Board Structure, Audit Committee Structure, Internal Audit Function, Internal Control Activity, and Auditor Independence, affect Earnings Quality.
- Managerial Ownership, Institutional Ownership, Commissioner Board Structure, Audit Committee Structure, Internal Audit Function, and Internal Control Activity, with Auditor Independence as moderating variable, affect Earnings Quality.

Research population is the manufacture companies that have been listing in Indonesia Stock Exchange from 2011 to 2015. This population contains 138 companies. Sampling technique is *purposive sampling*, and it is applied to all manufacture companies by criteria. The criteria involve listing in Indonesia Stock Exchange from 2011 to 2015 and having the complete data of research variables. Some companies that meet sampling criteria is attaining 112 companies with 560 research data. After conducting outlier test, the suitable amount of data is left only 553.

Data collection method in this research is documentation. Many annual reports are compiled, and it includes the report to commissioner board, report to director board, report of *corporate governance* implementation, internal control statement, internal audit statement, balance sheet, earnings-loss statement, and cash-flow statement, as well as notes for the financial statement. Some data are derived from the collection of investment gallery at STIE Malangkucecwara, and others are acquired from the publications of Indonesian Capital Market Directory. The completion of data is ensured by examining websites of Indonesia Stock Exchange and discerning *yahoo finance*.

Some variables are subjected to observation. These are described as follows.

a. *Corporate Governance Structure*. The proxies of this variable include Managerial Ownership (% of stock ownership); Institutional Ownership (% of stock ownership); Commissioner Board Structure (% of the independent member); and Audit Committee Structure (% of the independent member).
b. *Internal Audit Function*. This variable is measured with some proxies, such as: Quality Assurance (reported = 1; not-reported = 0); Formal Follow-Up (reported = 1; not-reported = 0); Coordination with Audit Committee and/or Auditor (reported = 1; not-reported = 0); and Education Background of Internal Auditor (accounting = 1; not-accounting = 0).
c. *Internal Control Activity*. Proxies that measure this variable are: Disclosure of Control Environment (disclosed = 1; not-disclosed = 0); Disclosure of Risk Assessment (disclosed = 1; not-disclosed = 0); Disclosure of Control Activity (disclosed = 1; not-disclosed = 0); and Disclosure of Information, Communication and Surveillance (disclosed = 1; not-disclosed = 0).
d. *Auditor Independence*. The measurement of this variable is done with dummies, such as value 1 = independent and value 0 = not-independent. Data of independence have been acquired from review report by Public Accountant Offices (PAO) and Network of Foreign Public Accountant Offices (NFPAO).
e. *Earnings Quality*. In this research, this variable is measured with two proxies.

   First proxy is *performance-adjusted discretionary accruals*. This proxy is developed by Kothari et.al. (2005). The estimated model of this proxy is:

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$$TAccr_{i;t} = \alpha_0 + \alpha_1(1/Assets_{i;t-1}) + \alpha_2\Delta Rev_{i;t} + \alpha_3 PPE_{i;t} + \alpha_4 ROA_{i;t} + \varepsilon_{i;t}, \ldots.(1)$$

$TAccr_{i;t}$: Total Accrual; measured as the change of *non-cash current assets*, subtracted from the change of *non-interest-bearing current liabilities*, subtracted by depreciation & amortization of company *i* at year *t*. The result is then scaled with the lag of total assets ($Assets_{i;t-1}$);

ΔRev_{it} : The change in annual revenue. It is scaled with the lag of total assets ($Assets_{i;t-1}$);

PPE_{it} : Property, Plant, and Equipment of company *i* at year *t*. It is scaled with the lag of total assets ($Assets_{i;t-1}$)

ROA_{it} : *Return on Assets* of company *i* at year *t*.

The second proxy is model suggested by Dechow & Dichev (2002) which is then modified by Francis et al., (2005), and Feng et al. (2011).

Specifically, model is estimated as follows:

$$TCAccr_{i;t} = \alpha_0 + \alpha_1 OCF_{i;t-1} + \alpha_2 OCF_{i;t} + a_3 OCF_{i;t+1} + \alpha_4 \Delta Rev_{i;t} + \alpha_5 PPE_{i;t} + \varepsilon_{i;t} \ldots\ldots\ldots (2)$$

$TCAccr_{i;t}$: Total Current Accruals; measured as the change of *non-cash current assets*, subtracted from the change of *non-interest-bearing current liabilities*. The result is then scaled with the lag of total assets ($Assets_{i;t-1}$);

OCF : Operational Cash Flow; measured as the sum of net earnings, depreciation & amortization, and the change of current liabilities, subtracted from the change of current assets. Result is then scaled with the lag of total assets ($Assets_{i;t-1}$)

$\Delta Rev_{i;t}$: The change in annual revenue. It is scaled with the lag of total assets ($Assets_{i;t-1}$)

$PPE_{i;t}$: Property, Plant, and Equipment of company *i* at year *t*. It is scaled with the lag of total assets ($Assets_{i;t-1}$)

Residual of the regression model is *discretionary accruals*. In this regression, the author uses the absolute value of *discretionary accruals* (DisAccr) as KLK proxy. This value is then multiplied by -1.

Classic Assumption Test

After subjecting the regression model to classical assumption test, it is found that the model has met the conditions required by multicollinearity test, autocorrelation test, heteroscedasticity test, and normality test. By these results, then the regression model is considered as fit.

Descriptive Statistic Test

The following table indicates the result of descriptive statistic test. This test is conducted to understand minimum rate, maximum rate, mean rate, and standard deviation of earnings quality, either in total

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accrual or total current accrual approaches in 112 companies on five observation periods (2011-2015) (Table 1).

Table 1. Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.
Earnings Quality 1	553	-.95	.00	-.1981	.12858
Earnings Quality 2	553	-.90	.00	-.0866	.11516
Man-Own	553	.00	90.00	3.1398	12.21998
Inst-own	553	.00	.99	.6925	.22158
Comm-BS	553	.00	1.00	.4301	.16008
Aud-Com.S	553	.00	1.00	.3529	.11705
Audit-IF	553	2.00	4.00	3.3454	.60647
IC-Act.	553	.00	4.00	2.7396	1.04821
IndepAud	553	.00	1.00	.8264	.37911
Valid N (list-wise)	553				

Of 112 go-public manufacture companies, earnings quality level (KLK) in total accrual approach has given the mean rate of –0.1981, the minimum rate of -0.95, the maximum rate of 0.00, and standard deviation of 0.12858. Earnings quality level in total current accrual is giving the mean rate of –0.866, the minimum rate of -0.90, the maximum rate of 0.00, and standard deviation of 0.11516. Based on the results of two approaches, it can be said that mean rate of total current accrual is better than that given by total accrual.

Managerial Ownership has the mean rate of 3.1398 with the standard deviation of 12.21998. This position shows that managerial ownership in manufacture companies that listing in Indonesia Stock Exchange is very low, and as a consequence, full control over company policies is less optimum. Institutional Ownership has the mean rate of 0.6925 with the standard deviation of 0.22. It signifies a condition that institutional ownership of the manufacture companies that listing in Indonesia Stock Exchange is very low, and thus, full control over company policies is less optimum. Commissioner Board Structure has the mean rate of 0.431 with the standard deviation of 0.16.

Equation 1:

$$\mathbf{EQ} = \alpha + \beta_1\mathbf{Man\text{-}Own} + \beta_2\mathbf{Ins\text{-}Own} + \beta_3\mathbf{Comm\text{-}BS} + \beta_4\mathbf{Aud\text{-}Com.S} + \beta_5\mathbf{Audit\text{-}IF} + \beta_6\mathbf{IC\text{-}act} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

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Table 2. GCG Models To Earning Quality

		Earnings Quality 1 with TAcc Approach				Earnings Quality 2 with TCAcc Approach			
R		.209[a]				.099[a]			
R Square		.044				.010			
Adjusted R Square		.033				-.002			
F		3.961				.867			
Sig.		.001[a]				.519[a]			
		B	Std. Error	t	Sig.	B	Std. Error	t	Sig.
1	(Constant)	-.258	.031	-8.256	.000	-.040	.022	-1.786	.075
	Man-Own	-.001	.000	-1.497	.135	.000	.000	.493	.622
	Inst-Own	.003	.021	.156	.876	-.007	.015	-.492	.623
	Comm-BS	.090	.025	3.602	.000*	.017	.018	.904	.366
	Audt-Com.S	.038	.034	1.113	.266	-.017	.025	-.697	.486
	Aud_IF	.002	.007	.271	.786	-.005	.005	-.975	.330
	IC-Act	.007	.004	1.783	.075**	-.003	.003	-1.234	.218

[a] Predictors: (Constant), IC-Act, Man-Own, Comm-BS, Audt-Com.S, Aud-IF, Inst-own
* significant at 5% level
** significant at 10% level

As shown in the Table 2 above, the independent variables will include Managerial Ownership, Institutional Ownership, Commissioner Board Structure, Audit Committee Structure, Internal Audit Function, and Internal Control Activity. These variables explain Earnings Quality at 3.3% level, while the remaining percentage is affected by another variable. Partially, Managerial Ownership and Institutional Ownership do not have a significant effect on Earnings Quality. This situation is supported by Arniati and Mardiyah (2008) who stated that managerial ownership does not influence income smoothing, and the presence of income smoothing signifies the condition of lower earnings quality. Audit Committee Structure, measured by the proxy of the independence of audit committee members, is not significantly influencing Earnings Quality. This finding is supported by Amin (2017) who found that audit committee does not affect earnings quality.

The result of analysis, however, indicates that Commissioner Board Structure, measured by the proxy of the independence of commissioner board, has a significant effect on Earnings Quality at 5% level. This position aligns with the findings of previous researchers, such as Fama & Jensen (1983); Sharma (2004); Abdul Rahman & Ali (2006); Osma & Noguer (2007); Osma (2008); Jaggy et al (2009); Lo, Wong & Firth (2010), and Prastiti & Wahyu (2013). Empirically, earnings quality can be measured by the presence of earnings management (Feng, Kristian, Qinytuan, & Xin, 2011). Internal Audit Function, with its proxies involving quality assurance, regular follow-up, coordination with the audit committee, and education background of internal auditor, has a significant effect on Earnings Quality at 10% level. Internal Control Activity has a significant positive effect on Earnings Quality at 10% level. The effectiveness of *corporate governance* is closely related to internal control (Hoitash & Bedard, 2009). The company with weak *corporate governance* always fails to detect or disclose material weakness. Bedard & Graham (2008) delivered evidence that management only is not enough to identify internal control weakness, and even, 84% proportions of material weakness are successfully detected by the auditor (Table 3).

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Equation 2:

$$\mathbf{EQ} = \alpha + \beta_1\mathbf{Man\text{-}Own} + \beta_2\mathbf{Ins\text{-}Own} + \beta_3\mathbf{Comm\text{-}BS} + \beta_4\mathbf{Aud\text{-}Com.S} + \beta_5\mathbf{Audit\text{-}IF} + \beta_6\mathbf{IC\text{-}act} + \beta_7\text{Indep-Aud} + \varepsilon \text{ .....} \quad (2)$$

Table 3. GCG Model and Auditor Independence

		Earnings Quality 1 with TAcc Approach				Earnings Quality 2 with TCAcc Approach			
R		.218[a]				.111[a]			
R Square		.047				.012			
Adjusted R Square		.035				-.001			
F		3.694				.923			
Sig.		.001[a]				.488[a]			
		B	Std. Error	t	Sig.	B	Std. Error	t	Sig.
1	(Constant)	-.253	.031	-8.034	.000	-.037	.022	-1.641	.101
	Man-Own	-.001	.000	-1.430	.153	.000	.000	.552	.581
	Inst-Own	.010	.022	.475	.635	-.003	.015	-.194	.847
	Comm-BS	.089	.025	3.539	.000*	.015	.018	.834	.405
	Aud-Com.S	.042	.034	1.210	.227	-.016	.025	-.652	.515
	Audit-IF	.001	.007	.179	.858	-.005	.005	-1.002	.317
	IC-act.	.009	.004	2.215	.027*	-.002	.003	-.792	.429
	IndepAud	-.018	.011	-1.573	.100**	-.010	.008	-1.198	.232

[a] Predictors: (Constant), IC-act., Man-Own, Comm-BS, Aud-Com.S, Audit-IF, Inst-Own, Indep.Aud
* significant at 5% level
** significant at 10% level

When the variable of Auditor Independence is set into Model of Good Corporate Governance, the result shows that the effect of independent variables on earnings quality becomes greater. This result is signified by the increase of Adjusted R-Square from 3.3% to 3.5% based on KLK measurement with Total Accrual approach. The role of the auditor on earnings quality is more meaningful if the auditor is independent. People trust given to auditor's verification on the earnings-loss statement is determined by auditor's competence and independence (Watt & Zimmennan, 1986). The partial result indicates that auditor independence has a significant effect on earnings quality at 10% level. Commissioner Board Structure and Internal Control Activity are consistently and significantly influencing Earnings Quality at 5% level. Independent auditor shall act as the protector of the empowering accounting practices because the auditor is not only having knowledge in accounting field but also building a close relationship with members in audit committee and director board who have a responsibility to follow the track of decision-makers in the company (Scott & Marshall, 2001) (Table 4).

Equation 3:

$$\mathbf{EQ} = \boldsymbol{\alpha} + \beta_1\mathbf{Man\text{-}Own} + \beta_2\mathbf{Ins\text{-}Own} + \beta_3\mathbf{Comm\text{-}BS} + \beta_4\mathbf{Aud\text{-}Com.S} + \beta_5\mathbf{Audit\text{-}IF} + \beta_6\mathbf{IC\text{-}act} + \beta_7\text{Indep-Aud} + \boldsymbol{\beta_8}\mathbf{Man\text{-}Own*Indep} + \boldsymbol{\beta_9}\mathbf{Ins\text{-}Own*Indep} + \boldsymbol{\beta_{10}}\mathbf{Comm\text{-}BS*Indep} + \boldsymbol{\beta_{11}}\mathbf{Aud\text{-}Com*Indep} + \boldsymbol{\beta_{12}}\mathbf{Audit\text{-}IF*Indep} + \boldsymbol{\beta_{13}}\mathbf{IC\text{-}act*Indep} + \boldsymbol{\varepsilon} \text{ ..} \quad (3)$$

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Table 4. GCG Model with Auditor Independence as a moderating variable

		Earnings Quality 1 with TAcc Approach				Earnings Quality 2 with TCAcc Approach			
R		.200				.099			
R Square		.040				.010			
Adjusted R Square		.016				-.014			
F		1.700				.402			
Sig.		.0057				.969			
		B	Std. Error	t	Sig.	B	Std. Error	t	Sig.
1	(Constant)	-.247	.122	-2.017	.044	-.229	.110	-2.091	.037
	Man-Own	9.175E-5	.001	.112	.911	-3.090E-5	.001	-.042	.966
	Inst-Own	-.021	.068	-.308	.758	.002	.061	.034	.973
	Comm-BS	.178	.089	1.995	.047*	.094	.080	1.180	.238
	Aud-Com.S	.091	.158	.574	.566	.025	.142	.176	.860
	Audit-IF	-.017	.029	-.585	.559	.036	.026	1.392	.165
	IC-act.	.001	.017	.067	.947	-.007	.015	-.494	.621
	IndepAud	0.014	.132	.105	.917	.178	.118	1.512	.131
	M-own_Indep	-.001	0.001	-1.058	0.290	0.00	0.001	0.150	0.881
	Ins-own_Indep	.010	.076	.133	.894	-.012	.068	-.184	.854
	ComBS_Indep	-.087	.097	-.897	.370	-.080	.087	-.918	.359
	Aucom_Indep	-.056	.166	-.337	.736	-.056	.148	-.377	.706
	Aud IF_Indep	.004	.030	.125	.901	-.044	.027	-1.622	.105
	AIC_Indep	.013	.018	.700	.484	.009	.016	.548	.584

[a] Predictors: (Constant), Man-Own, Inst-Own, Comm-BS, Aud-Com.S, Audit-IF, IC-act., IndepAud, M-own_Indep, Ins-own_Indep, ComBS_Indep, Aud.com_indep, Aud.IF_Indep
* = significant at 5% level

When Earnings Quality is measured with Total Accrual approach, the result indicates that independent variables are significantly influencing earnings quality at 5% level. When Total Current Accrual is used to measure earnings Quality, independent variables do not show a significant effect on earnings quality. The model above confirms the fact that Auditor Independence does not moderate the effect of Commissioner Board Structure, Internal Audit Function, and Internal Control Activity on Earnings Quality. In this position, Earnings Quality is directly influenced by Commissioner Board Structure, Internal Audit Function, and Internal Control Activity without the moderation of Auditor Independence.

Discussion

Theoretically, the involvement of auditor can reduce information asymmetry and potential conflict of interest between the management of the company and the user of financial information. Therefore, the presence of auditor shall improve the quality of financial information reported by management (Sumarwoto, 2006). The auditor will verify that earnings-loss statement has been made in the manner of fairness and compliance with Financial Accounting Standard (FAS), and also reflect "truly conditions" of economic and operational aspects of the company. The auditor is also required by audit standard to discuss and communicate about the desired earnings quality with the audit committee, and by such activity, it would reduce the possibility of opportunistic earnings management and also the risk of material misrepresentation (Jerry & Mark, 2010).

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Conclusions

Commissioner Board Structure, which is measured by the proxy of the independence of commissioner board, is significantly influencing Earnings Quality at 5% level. Internal Audit Function, with its proxies involving quality assurance, regular follow-up, coordination with the audit committee, and education background of internal auditor, has a significant effect on Earnings Quality at 10% level. It can be said that the presence of auditor would improve the quality of financial information reported by management (Sumarwoto, 2006). Internal Control Activity has a significant positive effect on Earnings Quality at 10% level. The effectiveness of *corporate governance* has a close relationship with internal control. The company with weak *corporate governance* is always difficult to detect or disclose material weakness. Bedard & Graham (2008) have given a proof that company management if they have required skill, can only identify minor proportion of internal control weakness because 84% proportions of material weakness are successfully detected by the auditor.

Managerial Ownership and Institutional Ownership do not have a significant effect on Earnings Quality. This finding is supported by Arniati and Mardiyah (2008) who found that managerial ownership is not influencing income smoothing, and income smoothing signalize lower earnings quality. Audit Committee Structure, which is measured by the proxy of the independence of audit committee members, does not significantly influence Earnings Quality. This finding is supported by Amin (2014) who asserted that audit committee does not affect earnings quality. This research the common managerial ownership 3.14% and institutional ownership 0.69%. It's too small, so the influence to earning quality is not significant.

By putting Auditor Independence into Good Corporate Governance Model, the effect of independent variables on earnings quality is getting bigger. Auditor Independence does not moderate the effect of Commissioner Board Structure, Internal Audit Function, and Internal Control Activity on Earnings Quality.

The result of this research shall give the proper theoretical contribution to the principles underlying the relationship of principal-agent-stakeholders through the instrument of the earnings-loss statement. This research is expected to produce the fittest model of earnings quality monitoring, respectively a model which predicts that the company with the higher level of accountability and transparency is one with the capability to produce the reliable quality of financial information.

The limitation of this research is that the author does not have access to data concerning with ownership structure of key stockholders. Therefore, the author is in the difficult position to measure ownership concentration. Besides, the author also does not have access to data of the result of assemblies held by Commissioner Board. Thus, it would limit the capacity of the author to measure Commissioner Board assemblies and other related variables.

References

Allegrini, M., Greco, G. 2013. Corporate boards, audit committees and voluntary disclosure: Evidence from Italian listed companies. *Journal of Management & Governance* 17(1): 187-216. https://doi.org/10.1007/s10997-011-9168-3

Amin, A., Suhardjanto, D. and Agustiningsih, S.W. 2017. Board-Auditor Interaction and Earnings Management: The Model of Company with Concentrated Ownership. *Review of Integrative Business and Economics Research* 6(3): 217-238. http://buscompress.com/journal-home.html

Anuchitworawong, C. 2010. The value of principles-based governance practices and the attenuation of information asymmetry. *Asia-Pacific Financial Markets* 17(2): 171-207. https://link.springer.com/article/10.1007/s10690-010-9114-4

Arniati, T., Mardiyah, A. 2008. Relationship between Ownership Structure, Firm Value, and Income Smoothing (Study at Go Public Firms). *Journal of Business Accounting and Management* 15(2): 363-380.

Bedard, J.C., Graham, L. 2008. Archival evidence on processes and outcomes of internal control assessment under Section 404 of the Sarbanes-Oxley Act. Working paper, Bentley University.

Brown, L.D., Caylor, M.L. 2004. Corporate governance and firm performance. , http://papers.ssrn.com/sol3/papers.cfm?abstract_id=586423

Dechow, P.M., Dichev, I.D. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77(s-1): 35-59. https://doi.org/10.2308/accr.2002.77.s-1.35

Francis, J.R., Reichelt, K., Wang, D. 2005. The pricing of national and city-specific reputations for industry expertise in the US audit market. *The Accounting Review* 80(1): 113-136. https://doi.org/10.2308/accr.2005.80.1.113

Francis, J.R. and Yu, M.D. 2009. Big 4 office size and audit quality. *The Accounting Review* 84(5): 1521-1552. https://doi.org/10.2308/accr.2009.84.5.1521

Governance Metrics International (GMI). 2005. Corporate Governance Ratings and Corporate Performance: An Analysis of Governance Metrics International (GMI) ratings www.gmiratings.com

Ianniello, G., 2015. The effects of board and auditor independence on earnings quality: evidence from Italy. *Journal of management & Governance* 19(1): 229-253. https://doi.org/10.1007/s10997-013-9285-2

Indonesian Accountant Association. 2015. Basic frame for preparation and presentation of earnings statement. Standard Board of Financial Accounting, p.78

Jennings, M.M., Pany, K.J., Reckers, P.M.J. 2006. Strong corporate governance and audit firm rotation: effects on judges' independence perceptions and litigation judgments. *Accounting Horizons* 20(3): 253–270. https://doi.org/10.2308/acch.2006.20.3.253

Kothari, S.P., Leone, A.J., Wasley, C.E. 2005. Performance matched discretionary accrual measures. *Journal Of Accounting And Economics* 39(1): 163-197. https://doi.org/10.1016/j.jacceco.2004.11.002

Lin, J.W., Hwang, M.I. 2011. Audit quality, corporate governance, and earnings management: A meta-analysis. *International Journal of Auditing* 14(1): 57-77. https://doi.org/10.1111/j.1099-1123.2009.00403.x

Larcker, D.F., Richardson, S.A., Tuna, I. 2007. Corporate governance, accounting outcomes, and organizational performance. The accounting review 82(4): 963-1008. https://doi.org/10.2308/accr.2007.82.4.963

McNichols, M.F., Stubben, S.R. 2008. Does earnings management affect firms' investment decisions?. *The Accounting Review* 83(6): 1571-1603. https://doi.org/10.2308/accr.2008.83.6.1571

Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2000. Tunneling. *American Economic Review* 90(2): 22-27. https://doi.org/10.1257/aer.90.2.22

Masiulevičius, A., Lakis, V. 2018. Differentiation of performance materiality in audit based on business needs. *Entrepreneurship and Sustainability Issues* 6(1): 115-124. http://doi.org/10.9770/jesi.2018.6.1(9)

Marra, A., Mazzola, P., Prencipe, A. 2011. Board monitoring and earnings management pre-and post-IFRS. *The International Journal of Accounting* 46(2): 205-230. https://doi.org/10.1016/j.intacc.2011.04.007

Mahrani, M., Soewarno, N. 2018. The effect of good corporate governance mechanism and corporate social responsibility on financial performance with earnings management as mediating variable. *Asian Journal of Accounting Research* 3(1): 41-60. https://doi.org/10.1108/AJAR-06-2018-0008

Mulford, Ch. W. and Eguene E.C. (2010), "Detection of accounting fraud: the financial numbers game", Translator: Aurolla S.Harahap, and Yudith D. Anggraini, PPM Publisher, Jakarta, p. 356.

Nagy, A.L. 2010. Section 404 compliance and financial reporting quality. *Accounting Horizons* 24(3): 441-454. https://doi.org/10.2308/acch.2010.24.3.441

Pirzada, K., Mustapha, M.Z.B., Wickramasinghe, D. 2015. Firm Performance, Institutional Ownership and Capital Structure: A Case of Malaysia. Procedia-Social and Behavioral Sciences, 211: 170-176. https://doi.org/10.1016/j.sbspro.2015.11.025

Pirzada, K. and Ahmed, M., 2013. Corporate governance quality in organization and its impact on key stakeholders (A case study of Attock Cement Public Limited Company, Pakistan). *Global Business and Economics Research Journal 2*(5): 66-74. https://ssrn.com/abstract=2382936

Shin, H. and Kim, S.I., 2019. The Effect of Corporate Governance on Earnings Quality and Market Reaction to Low Quality Earnings: Korean Evidence. *Sustainability* 11(1): 102. ttps://doi.org/10.3390/su11010102

Solikhah, B., Della Firmansyah, N., & Pirzada, K. 2017. The Influence of Effective BOC on Choice of Auditor. *Pertanika Journal of Social Science and Humanities* 25(S): 271-280. http://www.pertanika.upm.edu.my/view_archives.php?journal=JSSH-25-S-11

Sumarwoto. 2006. The effect of KAP rotation policy on earnings quality http://eprints.undip.ac.id/8197/1/Sumarwoto.pdf

Scott, W.R. 2003. Financial Accounting Theory. Prentice Hall. Canada, Toronto, Ontario, p.676

Stubben, S.R. 2010. Discretionary revenues as a measure of earnings management. *The Accounting Review* 85(2): 695-717. https://doi.org/10.2308/accr.2010.85.2.695

Tarasova, V.I., Mezdrykov, Y. V., Efimova, S.B., Fedotova, E.S., Dudenkov, D. A., Skachkova, R.V. 2018. Methodological provision for the assessment of audit risk during the audit of tax reporting. *Enterpreneurship and Sustainability Issues* 6(1): 371-397. http://doi.org/10.9770/jesi.2018.6.1(23)

Teoh, S.H. and Wong, T.J. 1993. Perceived auditor quality and the earnings response coefficient. *Accounting Review* 68(2): 346-366. https://www.jstor.org/stable/248405

Watts, R.L., L. and JL Zimmerman. 1986. Towards a Positive Theory of the Determination of Accounting Standards. *The Accounting Review* 53(1): 112-134. https://www.jstor.org/stable/245729

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IMPLEMENTATION OF INTERNAL CONTROLS AND THE SUSTAINABILITY OF SMEs IN HARARE IN ZIMBABWE

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Abstract Inspired by the assertion that preventative measures can prevent the failure of business enterprises, this paper sought to determine the types of internal controls and the degree to which SMEs implemented them in the central business district of Harare in Zimbabwe. By completing semi-structured questionnaires, the 135 respondents generated the quantitative data, which was analysed utilising Version 25 of the Statistical Package for the Social Sciences (SPSS) software. The results revealed that the conventional internal controls which are customary in larger business enterprises were either absent or not adequately implemented in the SMEs. A cross-gender comparison suggested that female-led SMEs were more likely to implement internal control systems than their male counterparts. By empirically justifying the need for internal control systems in SMEs, this paper contributes to both theory and practice, by reaffirming the effectiveness of internal controls and emphasising how their effective implementation can increase the sustainability of this business cohort.

Keywords: sustainability; small and medium-sized enterprises (SMEs); internal controls

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JEL Classifications: M4, M10, M14, M42.

1. Introduction and background

Although small and medium-sized enterprises (SMEs) play a crucial role in the growth of most economies, their sustainability is often adversely affected by factors that contribute to their demise within the first few years after being established (Kemp et al., 2015; Nyathi et al., 2018). This becomes a cause of concern for countries with a high proportion of SMEs (Akingbade, Aliu, Elegunde, Ogundele &, Saka 2013). The many reasons for the failure of SMEs include a typical lack of awareness of the inherent risks that are associated with operating a business and effective strategies to circumvent them.

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Irrespective of their sizes, all businesses are required to contend with a range of risks, which can be conveniently narrowed down to financial, operational, and technological risks. If not adequately managed, the risks are likely to influence the attainment of organisational goals adversely. Chimombe and Makochekanwa (2017) believe that the lack of capability to manage risks effectively compromises the sustainability of SMEs. Conversely, the chances of survival of SMEs will improve significantly through the effective management of risks, if appropriate internal controls are well-designed and implemented, the viability of the findings of studies such as the one that was conducted by, Gachoka, Aduda, Kaijage, and Okiro (2018) suggest that without internal controls, SMEs are bound to fail. By contrast, Eshima and Anderson (2017) maintain that the empirical evidence to support positive correlations between the implementation of internal controls and the sustainability of SMEs is limited. This perhaps justifies the need for more empirical studies.

Besides enriching the literature, Stone (2016) and Othman and Ali (2014) asset that the damage often done to both profits and the sustainability of businesses by the absence of internal control mechanisms or the ineffective implementation of them is immense and worth concerted intervention. Among the inevitable consequences are inefficiency, fraud, mismanagement, a loss of client assurance, and a loss of customers. Small businesses appear to be particularly prone to encounter losses in these respects, as the findings of the global fraud study of the Association of Certified Fraud Examiners (ACFE) of 2016 revealed that only 38% of small businesses had internal control departments, while the percentage for large companies stood at 88.3% (ACFE, 2016; Stone, 2016).

Even though SMEs are numerically predominant and the most vulnerable contributors to the economies of many countries, most research on the role that internal controls play in the sustainability of business organisations have tended to be mostly concerned with sizeable organisations. Even so, most of the relatively few studies of internal controls and sustainability in SMEs have focused on developed countries, with studies such as those of Adenyi and Adeniran (2017) being notable exceptions. Consequently, this research paper was prompted by the need to determine the influence of internal controls on the sustainability of SMEs in developing countries, with a particular emphasis accorded to Harare in Zimbabwe.

2. Literature review

2.1 Classification and significance of SMEs

Although definitions of SMEs tend to vary, defining characteristics in South Africa include the number of employees who are employed by individual organisations, turnover, and gross assets (South Africa, 1996). In Zimbabwe, SMEs are classified as enterprises which are staffed by not more than 100 employees. In many cases, crucial elements of the definitions of SMEs concern the roles which they play in the economies of their countries. SMEs make significant contributions to the economic growth of developing countries (Matamanda & Chidoko, 2017).

In Zimbabwe, the SME sector contributes more than 60% to the national GDP and employs an estimated 5.8 million people. Small businesses also make significant contributions to combating poverty, by reducing unemployment and improving living standards. As Berger, Bouwman, & Kim (2017) explain, in many cases SMEs provide opportunities for employment to people who would not be considered to be employable by larger corporations. SMEs are also widely acknowledged to be at the forefront of innovative practices (Bos-Brouwers, 2010), as the close and personal interactions which their employees have with consumers enable them to develop a good understanding of their needs through direct personal experience (Khalifa & Saad, 2017). In Zimbabwe, it is often customary for innovative workers to prefer to work in smaller businesses than in large organisations (Cohen, 2017).

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SMEs play a particularly vital role in the economy of Zimbabwe owing to their ability to repackage bulk purchases from distributors in quantities which are affordable to poor consumers who cannot afford to buy in bulk (Makochekanwa and Chimombe, 2017; Manaye, 2018). In many cases, SMEs are more capable of adapting to changing economic climates than their larger counterparts in the formal sectors of their countries. The emphasis which many SMEs place upon relationships with customers is evident from the findings of studies which have revealed that the loyalty of local customers is often not deterred even during economic crises (Kumar & Kumar Singh, 2017). The findings could suggest that SMEs are likely to display resilience during times of economic hardship. In the case of Zimbabwe during the 2008 global recession and local economic meltdown, SMEs played a significant role in helping to keep the economy afloat (Matamanda & Chidoko, 2017). Noko (2011) attributes the resilience of SMEs in Zimbabwe to the deftness with which they have been able to adapt to ever-changing government policies.

Güzel, Sağ, and Sezen (2016) argue that SMEs do not always stay small and that the majority of the corporations started as SMEs. Furthermore, SMEs which evolve into large corporations tend to remain in the communities in which they were first established (Seidl, Baumgarten, Beaumont, & Erskine, 2017). Choi, Lee, and Sonu (2013) emphasise that if the headquarters of large corporations remain in the communities in which they were established as SMEs, they invariably provide much-needed employment, which, in turn, stimulates local economies.

2.2 Sustainability and SMEs

As the meaning of the term ‘sustainability' is to a large extent dependent upon the contexts in which it is used, a plethora of different definitions can be applied to it. In the context of the management of businesses, both Dyllick and Hockerts (2002) and Perrini and Tencati (2006) characterise sustainability in terms of the capacity of business organisations to continue to operate over long periods, owing to the durability of the relationships which exist with relevant stakeholders. From a similar standpoint, Bruwer and Coetzee (2016) maintain that the crucial factors which determine sustainability pertain to resources and stakeholders. The overarching thrust of all of the assessments which have been made in this discussion is that sustainability is a concept which refers to a crucial criterion for the success of all business organisations.

Consequently, the rates at which small businesses continue to fail within the early stages of their operations make it imperative to conduct empirical studies to identify the principal factors which preclude the majority from surviving beyond their formative years. The respective estimates of Cohen, McKay, and Wolfe, (2017) and Kemp *et al*. (2015) are that 75% and 70%, respectively, of SMEs, fail within five years of having been established.

2.2.1 Measures of sustainability

Irrespective of the criteria which are used to assess corporate sustainability, researchers tend to agree that measuring sustainability represents a crucial step towards reaching a consensus concerning how it may be optimally achieved (Lee & Saen, 2012; Ozdemir et al. 2011). As qualitative procedures are usually used to measure sustainability, they are often time-consuming, costly, and dependent upon expertise. Consequently, although large organisations may have the resources to implement them, in many cases they are likely to be beyond the means of SMEs.

To understand how internal controls influence sustainability, not only is there a need for a definition and understanding of the concept of sustainability, but due consideration also needs to be given to how it is measured. The existence of many different interpretations of sustainability implies that there are several different facets of sustainability and the possibility of diversity concerning the optimal methods for measuring each type of sustainability. At present many different predetermined measures of social, economic, and environmental

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sustainability are used to determine whether enterprises are sustainable or not. Although the researcher does not wish to question the relevance or validity of the measures, it is also pertinent to point out that the use of predetermined measures could serve to preclude researchers from applying and assessing the relevance and validity of non-standard measures of sustainability, such as cultural sustainability. Although the social, environmental, and economic pillars upon which the concept of sustainability rests at present (Bos-Brouwers, 2010) are duly acknowledged, this paper is mainly concerned with cultural stability.

2.2.2 Economic sustainability

Although economic sustainability refers to the ability of enterprises to continue their operations profitably, profitability is not the only measure of economic sustainability. Other measures include the ability to withstand economic turbulence and the ability to recover from severe economic setbacks (Grimm, Hofstetter & Sarkis, 2016). In the context of this study, economic sustainability was of particular significance, as SMEs in Zimbabwe have been obliged to operate in an ailing economy for nearly two decades.

Since early 2000, the economy of Zimbabwe has undergone several reverses, collapses, and partial recoveries, all of which have influenced the sustainability of SMEs. From 2000 to the year in which this study was conducted (2017), SMEs have been affected by several developments at the macroeconomic level, most of which have had negative consequences. Among the measures to which the government resorted were the introduction of bearer cheques and dollarisation. Bearer cheques were introduced as an emergency measure and entailed replacing banknotes with cheques which were payable to bearers before particular expiry dates, while dollarisation saw the Zimbabwe dollar being replaced with the US dollar (Pilosoff, 2009). Subsequently, the Reserve Bank of Zimbabwe (RBZ) introduced bond notes, a new form of currency, to replace the US dollar. As those SMEs which have managed to survive the turbulent economic conditions which have plagued Zimbabwe since 2000 should be considered to be economically sustainable, for this study, sustainability is measured following the number of years for which individual SMEs have continued to operate profitably.

2.3 Drivers of sustainability

The sustainability of business organisations is influenced by both internal and external factors, with the former playing a crucial role (Lozano, 2015). Among the most significant internal drivers of sustainability are leadership, management styles, and internal control systems. Although this paper is primarily concerned with internal drivers, specifically the role of internal controls, it is necessary to provide an overview of external drivers, particularly concerning the sociopolitical and economic environments in which SMEs are required to operate in Zimbabwe.

2.3.1 External drivers: Sociopolitical and economic environments in Zimbabwe

Although dire sociopolitical and economic circumstances in Zimbabwe have militated against the successful operation of businesses, the consequences have been varied, in that many SMEs have thrived while others have collapsed (Mugobo & Wakeham, 2014). Many lessons can be drawn from both phenomena. The period from the time during which the study was conducted to the present has witnessed a further deterioration of economic conditions in Zimbabwe. The government responded by abolishing the Zimbabwe dollar in 2008 and adopting the US dollar as the official currency of the country, although the issuing of bond notes which were considered to be on a par with US dollars subsequently resulted in shortages of cash. Zimbabweans also preferred actual US dollars to the local bond notes, as they perceived them to be of higher value (Makanyeza & Mutambayashata, 2018).

As SMEs do not operate in a vacuum but instead depend to a large extent upon the success of the economies in which they operate, it is crucial that external factors which drive sustainability should be appropriately taken into account. In the case of Zimbabwe, shortages of cash at the national level inevitably precipitate internal problems, such as the theft of money or the abuse of resources. In addition to the sociopolitical factors which impede the

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successful functioning of business organisations, the Zimbabwean economy is mired in a multitude of regulations which also have adverse implications for their sustainability. A case in point is provided by the gazetting of Statutory Instrument 64 to limit the spending of consumers on imported luxury goods.

2.3.2 Financial resources

According to Navare and Handley-Schachler (2017), SMEs in Zimbabwe tend to be characterised by low capitalisation and to depend mainly upon the financial resources of their owners. Conversely, as Khalifa and Saad (2017) explain, the financial resources which are available to enterprises contribute significantly to their sustainability because they determine their capacities in respects such as hiring employees, acquiring assets, and obtaining financial assistance in the form of loans. Dach and Allmendinger (2014) maintain that although in some instances SMEs can thrive with limited financial resources, they are nonetheless at a higher risk of failing due to unexpected setbacks than those with significant access to financial resources.

Although the sustainability of business organisations requires substantial investment, SMEs are often at a distinct disadvantage, owing to a lack of financial resources (Nobanee & Ellili, 2016). Gandhi, Sachdeva and Gupta (2018) maintain that in many cases SMEs lack human capital, in that their limited financial resources often preclude them from attracting suitably qualified personnel to ensure their sustainability. During the period of dollarisation, the country underwent a crisis concerning liquidity, which resulted in severe shortages of cash and further compromised the sustainability of SMEs as a direct consequence. Although the local currency was discarded in favour of the US dollar, other currencies such as the South African Rand and the Botswana Pula were also used.

Mabhungu (2011) explains that the government of Zimbabwe adopted the US dollar and introduced a multi-currency system to curb the rampant hyperinflation which had ravaged the economy of the country until 2009. As Bhatasara, Chiweshe, and Helliker, (2018) point out, most SMEs in Zimbabwe are obliged to use manual systems and effectively precluded from having access to electronic payment systems which medium-sized and large enterprises usually have. Not only do they lack the ability to invest the substantial amounts of capital which are needed to acquire efficient electronic systems, but they typically require the knowledge and experience which are necessary to fulfil the legal requirements with which they need to comply to operate them.

2.3.3 Competition

The capacity of SMEs to continue their operations is threatened by the great competition which they face from many different sources (Papazov & Mihaylova, 2014). SMEs in many different industries in Zimbabwe are operating in direct competition with larger established enterprises in the country, and their markets have been further diluted by the importation of cheap goods from countries such as China and Dubai. Consequently, SMEs which rely extensively on local products or are unable to import competitively priced goods are likely to find themselves in an untenable position (Ayandibu & Houghton, 2017). The growth of sales which are transacted through the internet, in the form of either e-commerce or social commerce, has supplied yet another source of competition (Rahayu & Day, 2017). The combined effects of global economic crises, local economic upheavals, and the dramatically changing methods of transacting sales all have adverse implications for the sustainability of SMEs in Zimbabwe. Kusi-Sarpong, Gupta and Sarkis (2018) explain that the highly competitive and rapidly changing global business environment makes innovative practices both expensive and risky for all business organisations, including SMEs.

2.3.4 Internal drivers of sustainability

Batista and Francisco (2018) maintain that establishing corporate governance frameworks within business enterprises provides a crucial means of increasing their sustainability, while Choi, Lee, and Sonu (2013) emphasise that internal controls are essential to the sustainability of business enterprises. Although corporate

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governance and internal controls tend to be associated more with larger companies than SMEs, internal controls can significantly increase the sustainability of SMEs.

The internal controls which business enterprises can employ fall into three principal categories, namely, detective, preventative, and corrective. Although the different types of internal controls are used for various purposes, all contribute to achieving the objectives of individual business organisations (Germann & Manasseh, 2017). Werner and Gehrke (2018) contend that SMEs often lack adequate financial or human resources to implement the full spectrum of internal controls and that in many cases, the organisational structure of SMEs may preclude them from doing so. By contrast, Aduda *et al*. (2018) maintain that even SMEs whose resources are extremely slender can implement their controls to achieve their organisational objectives. Apart from the complex external factors which affect the sustainability of SMEs, their sustainability is also influenced by many internal factors such as corporate culture, the availability of financial and non-financial resources, and approaches and attitudes to management. Although SMEs may be obliged to devise and implement their internal controls, there is ample evidence to confirm that the sustainability of all business enterprises is determined, to a large extent, by their ability to develop and implement appropriate internal controls (Werner & Gehrke, 2018). The unique internal control practices, which are generated by SMEs in the absence of the financial and non-financial resources which many medium-sized and large business organisations have at their disposal, have tended to be overlooked by many studies which have been conducted to date.

2.4 Internal Controls and SMEs

Internal controls are developed and implemented to ensure the effectiveness and efficiency of the operations of business organisations, responsible financial reporting, and compliance with appropriate laws and regulations (Kaya, 2018; Committee of Sponsoring Organisations of the Treadway Commission (COSO), 2017). The findings of numerous studies confirm that internal controls have been used in business organisations to promote their sustainability Khalifa and Saad (2017); Kaya and Masetti (2018); COSO, 2017).

2.4.1 Factors which influence the efficacy of internal controls

The many categories of risks to which SMEs are exposed need to be effectively minimised if they are to achieve their goals (Navare & Handley-Schachler, 2017). Germann and Manasseh (2017) suggest that internal controls are designed to help enterprises achieve their objectives through the mitigation and elimination of potential risks, although Gachoka *et al*. (2018) point out that SMEs very often cannot implement the internal controls which are used by larger enterprises. According to Ge, Koester, and McVay (2017), an essential difference between SMEs and large corporations is articulated by the trend for the latter to be sufficiently well-resourced and positioned to develop and implement internal controls.

2.4.1.1 Governance and leadership

As the owners of SMEs often play an active role in all of the operations of their businesses, they are usually able to ensure that the activities are carried out per their standards and expectations. Consequently, the management of SMEs by their owners usually entails a style of leadership in which there is no separation between ownership and control (Fernández & Nieto, 2006).

Werner and Gehrke (2018) emphasise that internal controls need to be developed in a proper manner which facilitates their adoption and implementation. Accordingly, those tasked with the implementation of the internal controls in organisations need to be thoroughly conversant with the internal controls which have been developed (Park, Matkin, & Marlowe, 2017). In addition, it needs to be acknowledged that the ultimate effectiveness and efficiency of a system of internal controls requires the internal controls to be the responsibility of all employees, from the members of the management of organisations who design and monitor their implementation to the members of staff who carry out the various control procedures (Germann & Manasseh, 2017).

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2.4.2 Types of internal controls

Categories of internal controls are devised to perform different tasks. In this study, the classes of internal controls which are advanced by Olamide and Anastasia (2018) are used, namely, preventative, detective, and corrective controls. The latter are also known as compensating controls. Bruwer and Coetzee (2016) maintain that the presence or absence of each set of controls exerts a different influence upon the sustainability of SMEs.

2.4.2.1 Preventative controls

Aduda *et al*. (2018) explain that preventative controls are mechanisms, which are used to prevent undesirable consequences such as theft from occurring. Navare and Handley-Schachler (2017) maintain that preventative internal controls play a crucial role in ensuring the fluidity of business processes that, if they were to be impeded in any way, would prevent SMEs from attaining their operational objectives.

2.4.2.2 Detective controls

In certain instances, preventative controls in themselves may not be sufficient to safeguard the assets of SMEs and prevent losses and risks from undermining the success of their operations. The function of detective controls is to detect threats before the undesirable consequences of them occur (Germann & Manasseh, 2017).
Park *et al*. (2017) characterise detective controls as constituting the second line of defence after preventative controls. Conversely, Werner and Gehrke (2018) maintain that sufficiently effective and efficient preventative controls should ensure that the first line of defence eliminates risks. Detective controls can be employed for many purposes, such as quality control, legal compliance, and preventing and detecting instances of fraud (Gachoka, et al. 2018).

2.4.2.3 Corrective controls

Corrective controls play an equally vital role as those of preventative and corrective controls and enable organisations to limit the effects of damage which has occurred as far as possible (Ge *et al*., 2017). Consequently, it is imperative for business organisations to have appropriate policies and procedures to guide the implementation of corrective controls, which could take the form of issuing warnings to members of staff or even instituting procedures for dismissal in cases of dishonest conduct or gross negligence.
Effective corrective controls should ensure that business organisations can back up their stored data and have the luxury of restoring the functionality of systems in the event of unforeseen setbacks. As Haddow, Bullock, and Coppola (2017) argue that corrective controls can also take the form of a disaster management plan, which details the procedures, which should be followed before, during, and after the occurrence of a disaster or emergency.

Haddow *et al*. (2017) maintain that for a disaster management plan to be effective, it should be comprehensively documented in clear terms and easily implemented if and when unforeseen circumstances arise. A disaster management plan is corrective, in that it can provide the means to back up crucial information, such as information about debtors or creditors. The ability to plan for contingencies enables enterprises to remain afloat in times of crises by paying its creditors and ensuring that debtors pay them. Manufacturing enterprises are also able to back up vital information concerning the procedures and processes through which their products are manufactured. Also, Ge *et al*. (2017) characterise insurance as a corrective control.

2.5 Factors which discourage the comprehensive implementation of internal controls in SMEs

Werner and Gehrke (2018) emphasise the crucial role, which internal controls play in the operations of businesses and also acknowledge that many factors deter SMEs from formulating and implementing them. As it has already been explained, although many SMEs are unable to afford the controls, which are utilised by larger enterprises, they are often able to tailor practices to their specific needs concerning managing risks. Conversely, as Park *et al*. (2017) point out, the factors that make the practices difficult for SMEs to implement are similar to those, which affect larger enterprises concerning internal controls. The elements are discussed in the sections, which follow.

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2.5.1 Cost

Cost represents one of the most significant factors that discourage SMEs from developing and implementing internal controls (Manaye, 2013). Many SMEs are unable to secure sufficient funds to cover internal controls such as security features, control systems, digital systems, and other related facilities. Also, many lack the human capital that is needed to design and implement them.

2.5.2 Attitudes and knowledge

Navare and Handley-Schachler (2017) found that the owners of the SMEs that they studied tended to perceive internal controls as being necessary for larger organisations than their own and in many cases to have little relevance to the nature of their businesses. They also found that many of the owners were unwilling to change their approaches to the running of their companies, even in the face of the dramatic changes, which continue to redefine how business is conducted in the 21st century.

2.5.3 Separation of duties

Amroune et al. (2017) observe that although large corporations can spread the carrying out of crucial functions among large numbers of employees, SMEs often lack the human resources to do so. According to Nyathi et al. (2018), it is usually not considered extraordinary for a single employee in an SME to be responsible for performing several different tasks in crucial procedures. Failing to segregate duties and responsibilities inevitably results in increased exposure to the risk of errors and instances of fraud. In addition, it is also common for the owners of SMEs to be reluctant to delegate the performing of crucial tasks to members of their staffs, as they tend to believe that they maintain control over their businesses by performing the work themselves.
Ge *et al*. (2017) maintain that assigning responsibilities such as authorising transactions, keeping records, reconciliations of accounts, and custody of the assets of organisations to different employees increases the effectiveness and efficiency of internal controls. They also emphasise that individual employees should be assigned specific responsibilities, which should preferably be defined in a manner which provides appropriate orientation concerning their duties. According to Nyathi *et al*. (2018), the assignment of specific duties within holistic business practices to different, suitably qualified employees contributes significantly to the mitigation of risks.

3. Research design

Grounded on studies such as Bachman and Schutt, (2017) and Tomsic, Bojnec, and Simcic (2015), this paper adopted a quantitive approach to data collection and analysis.

3.1 Research population, sampling technique, and sample size

Cohen (2017) characterises a research population as an aggregation of elements from which a particular researcher wishes to make deductions. To Qin (2017), a target population alludes to a group of people or objects from which the data for a study is was derived and to which the findings of the study will apply. The target population for this study consisted of all of the SMEs that operated in the central business district (CBD) of Harare in Zimbabwe at the time of the study.

The stratified random sampling technique was employed to select the respondents for this study. As this method gave every SME the likelihood of being selected, it also ensured that the sample was an accurate reflection of the industries (Mac Lane, 2013).

The research sample comprised of 100 SMEs that were still operating and 35, which had ceased to function. As the size of the sample was significantly more than the recommended minimum of 30 for a quantitative survey

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(Eichler, Wu, Cox, Klaus, & Boardman, 2018), one may conclude that it was representation of the target population.

3.2 Collection and analysis of the data

A semi-structured questionnaire was utilised for soliciting quantitative data from the 135 SMEs that either operated or had operated in the CBD of Harare. The questionnaires were administerd by the researcher to individual entrepreneurs, managers, and owners of shops. The data which the questionnaires generated was analysed employing Version 25 of the Statistical Package for the Social Sciences (SPSS) software, and the findings were presented in the form of descriptive statistics.

4. Results and discussions

The researcher collected 81 completed questionnaires from the Active SMEs and 24 from the dormant ones. Table 1 provides a summary of the distribution of industrial sectors in which the SMEs either operated or had operated.

Table 1. Industrial sectors in which the SMEs in the research sample operated or had operated

		Active SMEs		Dormant SMEs	
		Frequency	Percentage	Frequency	Percentage
	Food and beverages	12	14.8	4	16.7
	Information and communications technology (ICT)	10	12.3	4	16.7
	Manufacturing and engineering	14	17.3	4	16.7
	Transport and logistics	15	18.5	4	16.7
	Retail and wholesale	18	22.2	4	16.7
	Services	12	14.8	4	16.7
	Total	**81**	**100.0**	**24**	**100.0**

Source: authors

Table 1 demonstrates that the sampling technique that was used enabled all sectors to be adequately represented. The food and beverage sector accounted for 14.8% of the active SMEs and 16.7% of the dormant ones, while the percentages for the information and communications technology (ICT) sector were 12.3% and 16.7% respectively. A further 17.3% of the active SMEs operated in the manufacturing and engineering sector, 18.5% in the transport and logistics sector, 22.2% in the retail and wholesale industry, and 14.8% were providers of services. It was significant to note that the dormant SMEs were equally represented in each sector, accounting for 16.7% of the sample of dormant SMEs in each instance.

Table 2. Ownership of the SMEs

	Active SMES		Dormant SMES	
	Frequency	Percentage	Frequency	Percentage
Family-owned and managed	23	28.4	5	20.8
Self-owned and managed	26	32.1	7	29.2
Separate ownership and management	32	39.5	12	50.0
Total	**81**	**100.0**	**24**	**100.0**

Source: authors

Table 2 records that 20.8% of the SMEs that had ceased operating had been owned and managed by families, 29.2% had been owned and run by single proprietors, and the ownership and management of 50% had been separate. The results further highlight that inability to retain key employees contributed to the demise of many that the SMEs studied. For instance, managers had resigned and formed businesses in the same lines of trade as those in which they worked in many cases.

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4.1 People responsible for developing and implementing internal controls

Table 3. People responsible for developing and implementing internal controls

	Active SMEs		Dormant SMEs	
	Frequency	Percentage	Frequency	Percentage
Owner	43	53.1	17	70.8
Manager	38	46.9	3	12.5
No one	2	2.5	4	16.7
Total	**81**	**100.0**	**24**	**100.0**

Source: authors

Table 3 reveals that in 53.1% of the active SMEs the internal controls were developed and implemented by the owners, while in 46.9 % the responsibility fell to manager, and in 2.5% no one was responsible for doing so, which suggests that in these instances the businesses operated without a clearly articulated set of internal controls. In 70.8% of the dormant SMEs, the internal controls had been developed and implemented by the owners, while in 12.5% the managers had been responsible for doing so, and in 16.7 % no one had been responsible for doing so.

Table 4. Educational qualifications of people who develop and implement internal controls

	Active SMEs		Dormant SMEs	
Level of educational attainment	Frequency	Percentage	Frequency	Percentage
Primary	14	17.3	5	20.8
Secondary (O-level)	30	37.0	8	33.0
High School (A-Level)	5	6.2	4	16.7
Senior certificate	6	7.4	2	8.3
Diploma	9	11.1	2	8.3
Undergraduate degree	8	9.9	2	8.3
Postgraduate	4	4.9	0	0
No Education	5	6.2	1	4..2
Total	**81**	**100.0**	**24**	**100.0**

Source: authors

In Table 4 it can be seen that 17.3% of the people who were responsible for developing and implementing internal controls in the active SMEs had not progressed beyond primary school, 37.0% had completed secondary school, 6.2 % had completed high school, 7.4 % held senior certificates, 11.1 % held diplomas, 9.9 % held undergraduate degrees, 4.9 % held postgraduate degrees, and 6.2% had received no formal education. The spread of levels of educational attainment was generally similar for the dormant SMEs. The widely varying levels of educational attainment tend to support the assessment of Mehralizadeh and Sajady (2006) that practical training and experience are as essential to the sustainability of businesses as educational qualifications.

To ascertain how qualifications were spread among the genders, the researcher employed cross tabulation. The findings are reflected in Figure 1.

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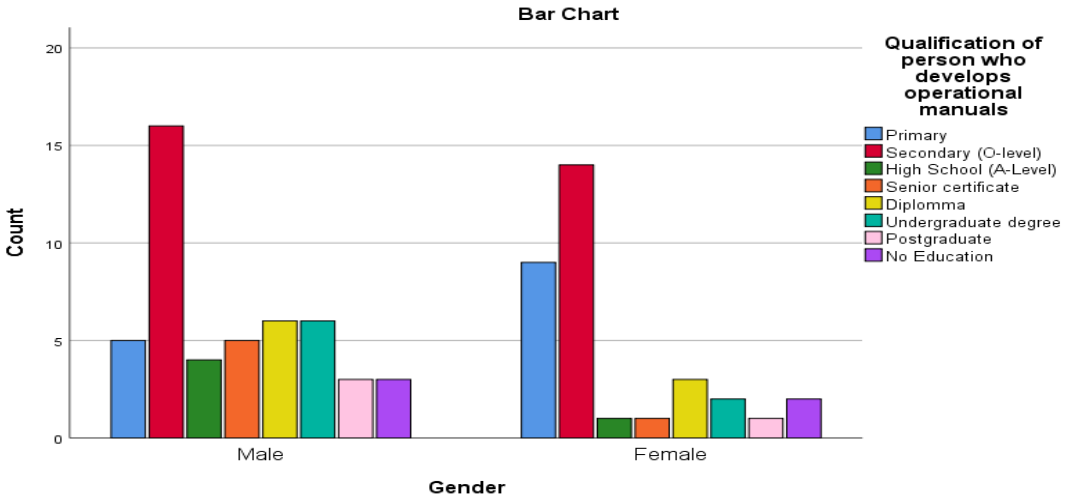

Figure 1. Cross tabulation of levels of educational attainment and genders of the respondents

Figure 1 illustrates that the levels of educational attainment of the male respondents were generally higher than those of the females and that most of the SMEs were either run or had been run by people who did not hold tertiary qualifications.

4.2. Manuals and procedures followed in implementing internal controls

Appropriate manuals provide coherently written guidance to those who are tasked with the implementation of internal controls following the policies of individual business organisations. Rahayu and Day (2016) maintain that the availability of and adherence to manuals contribute significantly to the sustainability of businesses. Table 5 provides a summary of the numbers of SMEs, which made use of or had made use of financial, operational, marketing, and technological manuals.

Table 5. First set of manuals to guide the implementation of internal controls

	Active SMES		Dormant SMES	
Item	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Financial manuals	30	37.0	6	25.0
Operational manuals	31	38.3	11	45.8
Marketing manuals	30	37.0	10	41.6
Technological manuals	29	35.8	11	12.5

Source: authors

Table 5, notes that 37% of the active SMEs had manuals to guide the implementation of internal controls concerning finances, 38.3% had manuals to guide operations, 37% to guide marketing, and 35.8% to guide the use of technology. For the dormant SMEs the percentages were 25%, 45.8%, 41.6%, and 12.5% respectively.

Table 6 summarises the numbers of SMEs that either used or had utilised manuals for cost control, income regulation, consumer relations and corporate governance. According to Lozano (2015), corporate governance represents the heartbeat of any business, and its absence is likely to have extremely negative implications for survival. These controls are also crucial to the effective management of the working capital of a business Yadav,

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Jain, Mittal, Panwar, and Sharma (2019) explain that business organisations need to regularly manage their working capital to maintain liquidity in their day-to-day operations. Appropriate by policies and working manuals provide the basis for the internal controls which need to be applied.

Table 6. Second set of manuals to guide the implementation of internal controls

	Active SMEs		Dormant SMEs	
Item	Frequency	Percentage	Frequency	Percentage
Cost control	37	45.7	12	50
Income regulation	25	30.9	9	37.5
Consumer relations	26	32.1	7	29.1
Corporate governance	19	23.5	4	16.67

Source: authors

Table 6 indicates that a significant majority of both the active and dormant SMEs prioritised cost controls over controls aligned to income regulation, consumer relations, and corporate governance. Among the active SMEs, 45.7% implemented cost controls, as opposed to 50% of the dormant SMEs. The table also reveals that the smallest percentages of both groups implemented controls to ensure optimal levels of corporate governance. This finding correlates that noted in Table 2, which showed that most of the SMEs in the sample were owned and managed by families or single proprietors, for whom the concept of corporate governance would be likely to appear abstract and irrelevant to the running of their businesses.

Table 7. Cross tabulation of the implementation of the first set of internal controls and gender

Gender	**Cost control**		**Income regulation**		**Consumer relations**		**Corporate governance**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Male	14%	40%	10%	33%	12%	36%	25%	35%
Female	36%	11%	28%	28%	23%	28%	38%	2%
Total		100%		100%		100%		100%

Source: authors

Table 7 illustrates that internal controls aligned to cost control, income regulation, consumer relations, and corporate governance were implemented in significantly more of the SMEs in the sample which was run by females than those which were driven by males. The female respondents who comprised 38% of the sample implemented controls to ensure effective corporate governance, while those who constituted 2% did not. By contrast, the male respondents who comprised 40% of the sample did not implement internal controls on cost control, the group which accounted for 33% did not implement internal controls relating to income regulation, and that which comprised 36% did not implement internal controls related to corporate governance. Table 8 summarises the distributions of the genders of the respondents regarding the implementation of financial, operational, marketing, and technological controls.

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Table 8. Cross tabulation of the implementation of the second set of controls and gender

Gender	Financial controls		Operational controls		Marketing controls		Technological controls	
	Yes	No	Yes	No	Yes	No	Yes	No
Male	38%	35%	10%	36%	11%	38%	45%	39%
Female	25%	2%	33%	21%	27%	24%	7%	9%
		100%		**100%**		**100%**		**100%**

Source: authors

Although almost all of the female respondents implemented financial controls, their male counterparts were relatively evenly distributed, in that 38% of the sample achieved the controls, while 35% did not. The female respondents also represented significantly higher percentages of the sample concerning the implementation of operational and marketing controls, while the male respondents who implemented controls concerning the use of technology represented a group which comprised 45% of the sample. By contrast, the female respondents who did so made up only 7% of the sample.

4.3 The benefits of internal controls for achieving the objectives of SMEs

The following two sections take the form of discussions of the benefits, which can be derived from the implementation of internal controls and the negative consequences that can result from failing to implement them.

4.3.1 Perceived benefits of internal controls

Although 46% of the respondents considered that internal controls resulted in increased overhead expenses for businesses in terms of both initial outlay and the costs, which are incurred through the implementation of monitoring practices, 66% believed that they resulted in reduced incidences of theft of stock and resources by customers, employees, and other stakeholders. A further 72% contended that internal controls would encourage potential investors to invest in or partner with SMEs, as they should serve to convince them that their investments and the assets of the SMEs were secure.

A relatively small group of 14% of the respondents maintained that internal controls facilitated the delegation of duties. This finding suggests that the owners or managers of many of the SMEs preferred to assume as many responsibilities as possible. It would be plausible to conclude that their reluctance to delegate responsibilities stems from an inability to detect instances of unethical behaviour, owing to a lack of appropriate controls. According to 20% of the respondents, microfinance institutions, banks, and the government assess the internal controls which SMEs implement before they commit to lending substantial amounts of money. Consequently, a lack of internal controls could constitute one of the principal reasons for the difficulty that many SMEs experience in attracting the capital and investments, which they need to establish themselves securely and to achieve adequate growth.

4.3.2 Consequences of an absence of internal controls

A significant majority of 64% of the respondents attributed rampant theft of their resources to a lack of internal controls, while 42% acknowledged that a lack of controls undermined the confidence of shareholders and stakeholders in their ability to grow and prosper. A further 16% believed that a lack of appropriate controls impeded employees from functioning optimally. This assessment suggests that a lack of controls is likely to result in excessive reliance upon decisions which are taken solely by owners, who in some cases may not have a sufficiently comprehensive understanding of the dynamics which prevail at the operational level. It could also suggest that excessively bureaucratic styles of leadership could serve to impede manufacturing schedules. A significant portion of 32% of the respondents contended that delayed decisions owing to bureaucratic practices

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resulted from an absence of internal controls, while 26% believed that a lack of internal controls increased the extent to which SMEs were exposed to the risk of cybercrime. More ever a small group of less than 10% maintained that SMEs which failed to implement internal controls were particularly likely to lose skilled and ethical members of their workforces and to fail to attract young graduates who could stimulate the adoption of innovative practices.

5. Conclusions, implications, and recommendations

While the people of Zimbabwe struggle to bring the governance of their country into line with democratic principles, the damage which was inflicted upon the economy by many years of totalitarian rule has left a lingering legacy. The economic collapse has resulted in many businesses struggling to survive in extremely unfavourable conditions and widespread poverty owing to ever-escalating levels of unemployment as businesses continue to be obliged to close. All of these phenomena have contributed to the highly volatile economic environment with which SMEs are required to contend in Zimbabwe. This study of active and dormant SMEs in Harare in Zimbabwe was conducted to contribute to their sustainability by providing a comprehensive understanding of functions that the effective implementation of internal controls performs. The findings underscore the overarching need for the leaders of SMEs to be schooled and capacitated with the requisite competencies to formulate and manage internal controls systems. It was evident that a great many of the SMEs in a large research sample either lacked articulated procedures for implementing internal controls or failed to implement internal controls adequately. Conversely, it was found that although the female respondents in many instances lacked the levels of educational attainment of their male counterparts, they were generally more aware of the need to implement internal controls.

The crucial role, which SMEs play in achieving economic growth in developing countries, is more widely acknowledged today than ever before. By emphasising the need for SMEs to integrate effective internal control systems, this paper advances the need for tailor-made policies, which support and empower SMEs by enabling them to benefit from the implementation of external controls. Through lobby groups, SMEs can influence the policies of any of the spheres of government that affect them and also to be adequately represented at the national level. Similarly, associations of SMEs could promote the development and implementation of government programmes to equip SMEs to play a decisive role in the achieving of economic growth and combating unemployment, particularly concerning enabling them to develop and implement internal controls to ensure their sustainability.

Although internal controls are widely perceived to be costly to implement, SMEs can and should identify cost-effective forms of internal controls by performing cost-benefit analyses before embarking upon the implementation of particular systems. Useful risk ratings could also play a vital role in enabling the owners and managers of SMEs to decide upon the types of internal controls that they need to implement. Another significant consideration that arises from the findings of this study is that internal controls serve not only to minimise risks, but also to provide insights into opportunities that can be exploited. Consequently, internal controls have the inherent capacity to perform at least two crucial functions and can be used to facilitate the growth of SMEs to larger enterprises. As developing and implementing effective internal controls entails an ongoing process, the perceptions and attitudes of those who are to be tasked with doing so need to accord with the priorities which internal controls serve. Accordingly, facilities should be made available to the owners and managers of SMEs to educate them concerning the concept of internal controls, the benefits which they provide, and the process of developing and implementing them. Furthermore, there is an increasingly pressing need for the adoption of ICT by SMEs in Zimbabwe, to maximise the benefits which their internal control systems can provide.

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http://doi.org/10.9770/jesi.2019.7.1(16)

References:

Makochekanwa, A., Chimombe, S. 2017. *Analysis of the impact of dollarisation on Zimbabwe's international trade flows*. University of Zimbabwe Publications. http://ir.uz.ac.zw/jspui/bitstream/10646/3492/1/Makochekanwa%20and%20Chimombe%2cS.%20Analysis_of_the_impact_of_dollarisation_on_Zimbabwe%E2%80%99s_international_trade_flows.PDF

Adeniyi, S.I. & Adeniran, B.G. 2017. Internal controls for sustainable development of small scale enterprises in Lagos State: A study of selected local governments. *Business Trends*, (7)2, 28-35. https://www.dfek.zcu.cz/en/tvp/doc/akt/2-2017-clanek-4.pdf

Amroune, B., Plaisent, M., Hafsi, T., Bernard, P. & Zuccaro, C. 2017. Success Factors of Upgrade Programs of SMEs in a Changing Environment, Resources Dependency Perspective: The Case of Algeria. https://doi.org/10.13189/aeb.2017.051103

Association of Certified Fraud Examiners. (2016). ACFE report to the nations on occupational fraud and abuse, 2016 global fraud study; about the report. Internal threats. Retrieved from https://www.acfe.com/rttn2016/docs/2016-report-to -the-nations.pdf

Ayandibu, A.O. & Houghton, J., 2017. The role of Small and Medium Scale Enterprise in local economic development (LED). *Journal of Business and Retail Management Research*, 11(2). http://www.jbrmr.com/cdn/article_file/i-26_c-262.pdf

Bachman, R.D. & Schutt, R.K. 2017. *Fundamentals of research in criminology and criminal justice*. Sage Publications. https://www.amazon.com/Fundamentals-Research-Criminology-Criminal-Justice/dp/1506359574.

Batista, A. & Francisco, A. 2018. Organizational sustainability practices: A study of the firms listed by the Corporate Sustainability Index. *Sustainability*, 10(1), 226. https://www.mdpi.com/2071-1050/10/1/226.

Berger, A.N., Bouwman, C.H. & Kim, D. 2017. Small bank comparative advantages in alleviating financial constraints and providing liquidity insurance over time. *The Review of Financial Studies*, p.hhx038. https://academic.oup.com/rfs/article/30/10/3416/3792480.

Bos‐Brouwers, H. E. J. 2009. Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice. *Business strategy and the environment*, 19(7), 417-435. https://onlinelibrary.wiley.com/doi/abs/10.1002/bse.652.

Brink, A., Cant, M. & Ligthelm, A. 2003. *Problems experienced by small business in South Africa*. Small Enterprise Association of Australia and New Zealand 16th Annual Conference, Ballarat, 28 Sept -1Oct, 2003.

Bruwer, J.P. & Coetzee, P. 2016. A literature review of the sustainability, the managerial conduct of management and the internal control systems evident in South African small, medium and micro enterprises. https://businessperspectives.org/images/pdf/free/7237/PPM_2016_02cont1_Bruwer.pdf.

Choi, J.H., Lee, J. & Sonu, C.H. 2013. Determinants of human resource investment in internal controls. *China Journal of Accounting Research*, 6(3), 167-185. https://www.sciencedirect.com/science/article/pii/S1755309113000257.

Cohen, E., 2017. *Sustainability for SMEs*. Routledge, p. 356.

Cohen, G. & Ladaique, M. 2018. Drivers of Growing Income Inequalities in OECD and European Countries. In *Reducing Inequalities* (pp. 31- 43). Palgrave Macmillan, Cham.

Dach, L., & Allmendinger, K. 2014. Sustainability in Corporate Communications and its Influence on Consumer Awareness and Perceptions: A study of H&M and Primark. *Procedia-Social and Behavioral Sciences*, 130, 409-418. https://www.sciencedirect.com/science/article/pii/S1877042814029589.

Dyllick, T. & Hockerts, K. 2002. Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11 (2), 130 -141. https://onlinelibrary.wiley.com/doi/abs/10.1002/bse.323.

Eichler, C.M., Wu, Y., Cox, S.S., Klaus, S. & Boardman, G.D. 2018. Evaluation of sampling techniques for gas-phase siloxanes in biogas. *Biomass and Bioenergy*, 108, 1-6. https://www.sciencedirect.com/science/article/pii/S0961953417303653.

Eshima, Y. & Anderson, B.S. 2017. Firm growth, adaptive capability, and entrepreneurial orientation. *Strategic Management Journal*, 38(3), 770-779. https://onlinelibrary.wiley.com/doi/abs/10.1002/smj.2532.

Noko, J., 2011. Dollarization: the case of Zimbabwe. *Cato Journal*, 31, 339. https://ideas.repec.org/a/cto/journl/v31y2011i2p339-365.html.

Eshima, Y. & Anderson, B.S., 2017. Firm growth, adaptive capability, and entrepreneurial orientation. *Strategic Management Journal*, *38*(3), 770-779. https://onlinelibrary.wiley.com/doi/abs/10.1002/smj.2532.

Fama, E.F. & Jensen, M.C. 1983. Separation of ownership and control. *The journal of law and Economics*, 26(2), 301-325. https://www.jstor.org/stable/725104?seq=1#metadata_info_tab_contents.

Fernández, Z. & Nieto, M.J., 2006. Impact of ownership on the international involvement of SMEs. *Journal of international business studies*, 37(3), 340-351. https://link.springer.com/article/10.1057/palgrave.jibs.8400196.

Gachoka, N., Aduda, J., Kaijage, E., & Okiro, K. 2018. The Moderating Effect of Organizational Characteristics on the Relationship between Budgeting Process and Performance of Churches in Kenya. *Journal of Finance and Investment Analysis*, *7*(2), 1-5. *www.scienpress.com/download.asp?ID=584495.*

Gandhi, S., Sachdeva, A. & Gupta, A. 2018. Distributor service quality in Indian SMEs: A bi-directional customer perspective. *Uncertain Supply Chain Management* 6(4), 335-356. http://growingscience.com/beta/uscm/2741-distributor-service-quality-in-indian-smes-a-bi-directional-customer-perspective.html.

Ge, W., Koester, A., & McVay, S. 2017. Benefits and costs of Sarbanes-Oxley Section 404 (b) exemption: Evidence from small firms' internal control disclosures. *Journal of Accounting and Economics*, 63(2), 358-384. https://www.sciencedirect.com/science/article/pii/S0165410117300113.

Germann, S. & Manasseh, S. 2017. Internal Controls in Small and Medium Size Enterprises: A Study of Matamata. *AMR*, p.51.

Nyathi, K. A, Nyoni, T., Nyoni, M., and Bonga, W. G. 2018. The Role of Accounting Information in the Success of Small & Medium Enterprises (SMEs) in Zimbabwe: A Case of Harare. *Journal of Business and Management* 1(1), 01-15. Available at SSRN: https://ssrn.com/abstract=3114042

Grimm, J.H., Hofstetter, J.S., & Sarkis, J. 2016. Exploring sub-suppliers' compliance with corporate sustainability standards. *Journal SMEs*, 112, 1971-1984. https://www.sciencedirect.com/science/article/pii/S0959652614012165.

Haddow, G., Bullock, J. & Coppola, D.P. 2017. *Introduction to emergency management*. Butterworth-Heinemann.

Helliker, K., Chiweshe, M.K. & Bhatasara, S. eds., 2018. *The Political Economy of Livelihoods in Contemporary Zimbabwe*. Routledge.

Kaya, O. & Masetti, O. 2018. SME Financing and Securitization: Firm‐Level Evidence from the Euro Area.

Kemp, A. Bowman, A., Blom, B., Visser, C., Bergoer, D., Fullard, D., Moses, G., Brown, S-L., Bornman, J., & Bruwer, J-P. 2015. The usefulness of cash budgets in micro, very small, and small retail enterprises operating in the Cape Metropolis. *Expert Journal of Business and Management*, 3(1), 1 – 12. https://ideas.repec.org/a/exp/bsness/v3y2015i1p1-12.html.

Khalifa, A.H. & Saad, M. 2017. The determinants of trust in the customer–service provider relationship: The case of Tunisian small and medium-sized enterprises (SMEs). *International Journal of Technology Management & Sustainable Development*, *16*(3), 295-310. https://www.ingentaconnect.com/contentone/intellect/tmsd/2017/00000016/00000003/art00006?crawler=true&mimetype=application/pdf.

Kumar, R. & Singh, R. 2017. Coordination and responsiveness issues in SME supply chains: a review. *Benchmarking: An International Journal*, *24*(3), 635-650. https://www.emeraldinsight.com/doi/abs/10.1108/BIJ-03-2016-0041.

Kusi-Sarpong, S., Gupta, H. & Sarkis, J. 2018. A supply chain sustainability innovation framework and evaluation methodology. *International Journal of Production Research*, 1-19. https://www.tandfonline.com/doi/abs/10.1080/00207543.2018.1518607?journalCode=tprs20.

Lee, K.H. & Saen, R.F. 2012. Measuring corporate sustainability management: A data envelopment analysis approach. *International Journal of Production Economics*, 140(1), 219-226. https://www.sciencedirect.com/science/article/pii/S0925527311003781

Ligthelm, A.A. & Cant, M.C. 2002. *Business success factors of SMEs in Gauteng*. Pretoria: University of South Africa. https://www.worldcat.org/title/business-success-factors-of-smes-in-gauteng-a-proactive-entrepeneurial-approach/oclc/51481530.

Mabhungu, I., Blessing, M., Simbarashe, M., Divaris, J., Lloyd, C. 2011. Factors influencing micro and small enterprises' access to finance since the adoption of multi-currency system in Zimbabwe. *E3 Journal of Business Management and Economics*, 2(6), 217-222. citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.907.1195&rep=rep1....

Mac Lane, S. 2013. *Categories for the working mathematician*. Springer Science & Business Media (Vol.5) https://www.springer.com/gp/book/9780387984032.

Manaye, M.K. & Tigro, M.G. 2018. Challenges for Small and Micro Enterprises in Accessing Finance (Case of Wolaita Soddo Town). *Global Journal of Management and Business Research* https://journalofbusiness.org/index.php/GJMBR/article/view/2339/2240.

Matamanda, S.H. & Chidoko, C. 2017. Accessing formal financing by Small and Medium Enterprises in Zimbabwe: The case of SMMEs and banks in Chiredzi Urban. *Cell*, *263*(773), 555908.

Mehralizadeh, Y. & Sajady, S.H. 2006. A study of factors related to successful and failure of entrepreneurs of small industrial business with emphasis on their level of education and training https://papers.ssrn.com/sol3/papers.cfm?abstract_id=902045.

Mugobo, V.V. & Wakeham, M. 2014. Re-branding Zimbabwe: A transformative and challenging process. *Mediterranean Journal of Social Sciences*, *5*(27 P1), 298. www.mcser.org/journal/index.php/mjss/article/download/5083/4906.

Navare, J. & Handley-Schachler, M. 2017. Financial aggregation of risks for SMEs in developing economies: a conceptual framework of financial aggregation and microinsurance effects. In: Spence, L.J.; Frynas, J.G. Muthuri, J., & Navare, J. (eds). Handbook on Small Business Social Responsibility: Global Perspectives. Edward Elgar. http://eprints.mdx.ac.uk/22955/

Ng, H.S. & Kee, D.M.H. 2018. The core competence of successful owner-managed SMEs. *Management Decision*, 56(1), 252-272. https://www.emeraldinsight.com/doi/abs/10.1108/MD-12-2016-0877.

Niță, C.G. & Ștefea, P. 2014. Cost control for business sustainability. *Procedia-Social and* Behavioural Sciences, 124, 307-311. https://www.sciencedirect.com/science/article/pii/S1877042814020382.

Nobanee, H. & Ellili, N. 2016. Corporate sustainability disclosure in annual reports: Evidence from UAE banks: Islamic versus conventional. *Renewable and Sustainable Energy Reviews*, *55*, 1336-1341. https://www.sciencedirect.com/science/article/pii/S1364032115007315.

Olamide, O. & Anastasia, O.O. 2018. Management Controls and Small Scale Enterprise's (SSEs) Profitability in Ogun State, Nigeria. *Covenant Journal of Entrepreneurship* (Special Edition), 1(1). https://journals.covenantuniversity.edu.ng/index.php/cjoese/article/view/826.

Othman, R. & Ali, N. 2014. NPO, internal controls, and supervision mechanisms in a developing country. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 25(1), 201-224. https://link.springer.com/article/10.1007/s11266-012-9335-4.

Ozdemir, A.I. & Aslan, E. 2011. Supply chain integration, competition capability and business performance: a study on Turkish SMEs. *Asian Journal of Business Management*, *3*(4), 325-332. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjGkZ_M8PrgAhVDxhoKHc-ZCYIQFjAAegQIARAC&url=http%3A%2F%2Fmaxwellsci.com%2Fprint%2Fajbm%2Fv3-325-332.pdf&usg=AOvVaw0a9Wz5XPLyvYoPP_r7fwc7.

Papazov, E., & Mihaylova, L. 2014. Linking Accounting Information with Business Planning in Bulgarian SMEs. In *8th International Management Conference: Management challenges for sustainable development. Bucharest, Romania* (pp. 321-327). https://ideas.repec.org/a/rom/mancon/v8y2014i1p321-327.html.

Park, Y.J., Matkin, D.S. & Marlowe, J. 2017. Internal control deficiencies and municipal borrowing costs. *Public Budgeting & Finance*, 37(1), 88-111. https://onlinelibrary.wiley.com/doi/abs/10.1111/pbaf.12120.

Perrini, F. & Tencati, A. 2006. Sustainability and stakeholder management: The need for new corporate performance. *Business Strategy and the Environment*, 15(5), 296 – 308. https://onlinelibrary.wiley.com/doi/abs/10.1002/bse.538.

Pilossof, R. 2009. 'Dollarisation 'in Zimbabwe and the Death of an Industry. Review of African Political Economy, 36(120), 294-299. https://www.jstor.org/stable/27756273?seq=1#metadata_info_tab_contents.

Qin, J. 2017. Examples and Basic Theories for Length Biased Sampling Problems. In *Biased Sampling, Over-identified Parameter Problems and Beyond* (pp. 1-9). Springer, Singapore. https://link.springer.com/chapter/10.1007/978-981-10-4856-2_1.

Rahayu, R. & Day, J. 2017. E-commerce adoption by SMEs in developing countries: evidence from Indonesia. *Eurasian Business Review*, *7*(1), 25-41. https://link.springer.com/article/10.1007/s40821-016-0044-6.

Sağ, S., Sezen, B. & Güzel, M. 2016. Factors that motivate or prevent adoption of open innovation by SMEs in developing countries and policy suggestions. *Procedia-Social and Behavioral Sciences*, *235*, 756-763. https://www.sciencedirect.com/science/article/pii/S1877042816316111.

Seidl, M., Baumgarten, A., Beaumont, S. & Erskine, S. 2017. *Microsoft System Center 2016 Orchestrator Cookbook*. Packt Publishing Ltd.

Siwangaza, L., Smit, Y., Bruwer, J., & Ukpere, W. I. 2014. The status of internal controls in fast moving small medium and micro consumer goods enterprises within the Cape Peninsula. *Mediterranean Journal of Social Science*, 5(10), 163-175. http://www.mcser.org/journal/index.php/mjss/article/view/2879.

Stone, R. 2016. Fraud, security, and controls in small businesses: A proposed research agenda. *Journal of Business*, 1(3), 15-21. https://www.journalofbusiness.us/index.php/site/article/download/44/15.

Tomšič, N., Bojnec, Š. & Simčič, B. 2015. Corporate sustainability and economic performance in small and medium sized enterprises. *Journal of Cleaner Production*, 108, 603-612. https://www.sciencedirect.com/science/article/pii/S095965261501207X.

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DEVELOPMENT OF ELECTRONIC BANKING: A CASE STUDY OF UKRAINE

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Abstract. The article examines the practice of providing financial services in the conditions of security electronic business and outlines the preconditions for the transformation of financial services using various forms of electronic banking. The phases of development of Internet banking and use of mobile banking are considered. The international practice of electronic banking on the example of Poland with a detailed analysis of clients and the characteristics of the leading Polish banks is analyzed. The market of domestic Internet banking services is characterized and the main problems that hinder its development in modern conditions are revealed. The advantages and disadvantages of the wide dissemination of Internet technologies in Ukraine are formulated. Almost all banks that occupy leading positions in the market of banking services offer e-banking services, as it enables clients, without attending a branch of banks, to carry out a wide range of banking operations: to manage the volume of resources on their own account; exchange currency; make payments and transfers; pay for services of mobile communication, Internet, utilities, taxes, fines. The introduction of innovative forms of remote-servicing expands the profile of traditional risks and creates new sources of their occurrence. Therefore, the process of identifying security risks in the use of electronic banking, assessments and risk minimization techniques is a prospect for further research.

Keywords: bank; electronic banking; remote bank service; internet banking; mobile banking; innovations

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1. Introduction

Today, in conditions of hard competition, the quality of the bank is determined by the level of development of innovative technologies and ideas that greatly simplify the process of interaction between customers and the bank. Electronic banking is widespread in America and Europe in today's conditions is in demand in the Ukrainian market. In order to remain in the market, banks need to increase their competitiveness, for example, through the introduction of new services, the development of modern technology in order to meet the needs of customers. Remote service today serves as a modern tool in banking, which has not only mobility, but also high functionality, availability and security. The perspective of remote banking services requires a deeper theoretical study and practical aspects of its implementation, which indicates the relevance of this topic.

2. Literature review

The issue of electronic banking development is interesting for many domestic and foreign economists and practitioners such as S. Vakhnyuk (Vachnyk, 2003), O. Yesin (Jesina, 2013), O. Chub (Chyb, 2017), S. Voitschovska-Philippe (Wojciechowska–Filipek, 2010), C Zalesk, (Zaleska, 2007), M. Kisil (Kisiel, 2007), and others. In one article it is analyzed the current state of development of the banking network in Ukraine as one of the types of distance in the banking sector system and the essence of the concept of the Internet banking – its opportunities and advantages are determined (Jesina, 2013). But as the current state of Internet banking shows, there are still a number of unresolved issues that require new developments to determine the best ways to use e-banking. The author does not highlight the disadvantages of using remote banking services. The scientist S. Vakhnyuk notes that an alternative strategy that can ensure the competitive advantages of commercial banks should be based on the organization of remote customer service capabilities. For today, the servise of access of bank and client cooperation is possible within «client – bank» system. Some banks, working on the prospect, offer an on-line version of the "client-bank" that uses the Internet for information exchange (Vachnyk, 2003). However, we believe that this approach has its own disadvantages, because it requires the installation of specific software on the user's computer to provide the functions of the client interface, encryption, transmission and receipt of information. Therefore, we can say that the system «client – bank» does not fully address the issue of user independence from its geographical location.

Electronic banking includes such areas as online information service, digital money issue, electronic payments and settlements, as well as deposit and loan operations, currency and stock transactions carried out electronically. This definition is used Gracheva M as generalized and is adequate for all forms of electronic access of customers to banking services (Gracheva M, 2002). It is worth paying attention to the opinion of the scientist and agree with it.

Synthesis of bank financial management integrated technologies should involve consistency of indicators used as part of these technologies. For this purpose, they should reflect the strategic goals and be interrelated so that one can trace how changes in some indicators affect the others. This means that during the process of implementation of bank financial management integrated technologies priority should be given to the most significant indicators, such statements are highlighted by Iryna Chmutova in her work **(**Chmutova I., 2017**).** sufficiently pointed out by Bank Management, but there is insufficient implementation of banking technology.

At the same time, it should be noted that the available tools rely on different analytical methods to support integrated management technologies, leading to inconsistency of managerial decisions based on the analysis of different metrics. E. Bessonova, Boiar A. and T. Domkhokova deal with this problem by using balanced scorecard indicators for controlling purposes (Bessonova E., Boiar A.; 2016; Boiar et al. 2018). Another problem which has

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not been addressed by researchers is the need to consider the current stage of the bank's development when forming a set of analytical parameters underlying remote banking service.

Strengthening banking supervision with the use of Internet banking, highlighted in the work of Y. Romanenko and I. Chaplay. They describe the complexity of the internal construction of the functional system of transactions that are part of the banking supervision mechanism determines the need for a unified approach to harmonize the content and procedures for the implementation of these functions, which should ensure the effectiveness of supervisory activities in general (Romanenko Y.; Chaplay I., 2017).

Scientist T. Shevchuk proposes the basic factors for further development of Internet banking in Ukraine which will attract much more clients, increase speed and quality of service of client's cashless payments, develop functionality and services convenient and affordable for the clients, increase the safety of banking in general (Shevchuk T., 2015). Solutions of the specified questions are caused by relevance and timeliness of scope of a research.

The authors agree that the rapid development of computer and telecommunication technologies increases the efficiency of both the banking services themselves and their sales channels, greatly expanding the market and the geography of services that can be used by the client. However, issues related to the operation of various forms of electronic banking services, security and the use of innovative gadgets and technologies as e-banking tools are not sufficiently investigated.

The purpose of the study is the development of scientifically grounded proposals for improving efficiency of using the latest financial electronic technologies as new competitive services of a bank. The main issues that are investigated in the article are the international practice of electronic banking on the example of Poland and the analysis of domestic Internet banking services.

3. Research methods

The theoretical and methodological basis of the research is the basic provisions of modern economic theory, the work of leading domestic and foreign scientists on the issues of remote banking services. In article all materials are worked out by means of a complex of methods of scientific research, in particular the direct description of the studied phenomenon, processing of statistical information by means of economic methods of a research, representation of the received results by means of a tabular form and a graphic method.

The scientific novelty of the obtained results is represented by a set of theoretical and practical aspects of the research, namely proposals on the impact of technology development on the development of banking products and recommendations for the further development of various forms of electronic banking in Ukraine.

4. Presentation of the main research material

Electronic banking, as one of the ways to provide banking services, has gained widespread popularity in developed countries and gradually captures the Ukrainian financial and credit sector. It should be noted that customers are increasingly choosing easy access to services that they can use anywhere.
The Bank is one of the intermediary institutions, which makes possible the flow of funds from legal entities with a financial surplus for those who have a deficit. In this case, the bank accumulates and distributes the capital.
It is very important to value the tendencies of different asset classes which are in foreign reserves portfolio (Teresienė, D., 2018).

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The development of information technology plays an important role in the bank (Tsymbaliuk I., 2017). Electronic banking operations are characterized by the fact that the client is able to benefit from every service offered by the bank using an electronic device.

Electronic banking includes such areas as online information service, digital money issue, electronic payments and settlements, as well as deposit and loan operations, currency and stock transactions carried out electronically. This definition is used as generalized and is adequate for all forms of electronic access of customers to banking services (Gracheva et al, 2002).

In the process of stage development, forms of electronic banking changed according to the evolution of software tools and hardware means (Yakubiv V., 2015). The main forms of electronic banking are PC-banking, Internet-banking, mobile banking, video banking, tele-banking and self-service terminals (POS terminals and ATMs). Details are described in Figure 1.

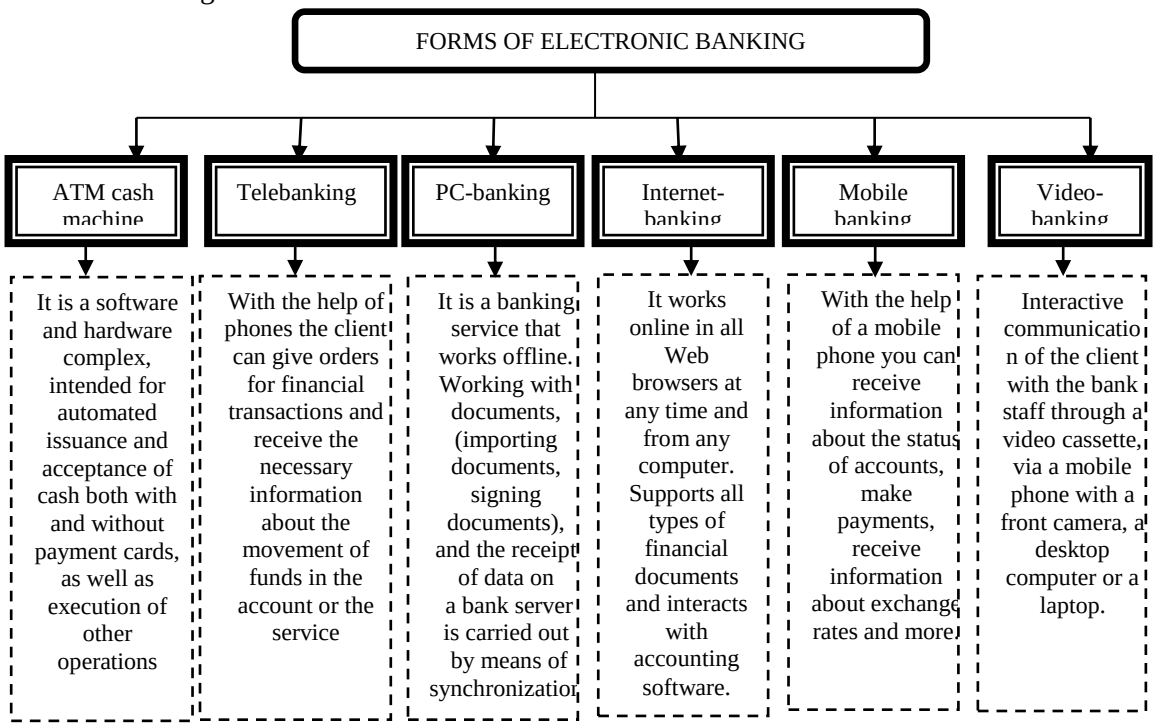

Fig. 1. Forms of Electronic Banking

Source: built by the authors

The vast majority of these forms are still functioning, but there is a clear tendency of prevalence of Internet banking and mobile banking. Mobile banking offers customer service, very similar to those offered by a traditional bank. The difference lies in the fact that due to the mobility of transactions, they are held for a short time, without the need to stand in queue at the branches of the bank and wait for the appropriate decision. Internet services are divided into two parts: the first one is information that is accessible to all users with Internet access without signing an agreement with the bank, and the second - operations that allow you to perform various actions on your account, but only after the agreement with the bank. After the transaction is signed, the client receives the login and password for the first time you sign in to your account. Other services are activated by the user through the website or the corresponding application of the given bank in the phone. The exception is products related to the assessment of creditworthiness, when the client must personally contact the bank.
The stage of development of Internet banking is shown in Figure 2.

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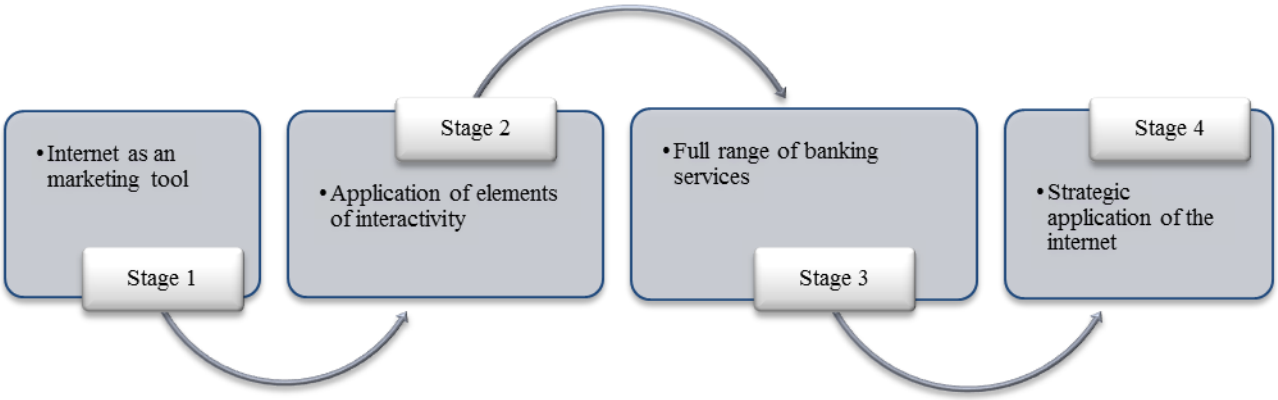

Fig. 2. Stages of Internet Banking Development

Source: own research based on (Wojciechowska – Filipek, 2010).

The first stage of Internet banking development includes marketing and promotion. At this stage, it is important to provide the client with the maximum amount of information related to the activities of the bank. The first step is to create a bank website, which should contain information related to the bank's activities, a list of services provided by the bank, an updated map of branches and ATMs, which allows the client to contact the bank by e-mail. This will allow the dissemination of information among potential bank customers (Wojciechowska - Filipek, 2010). At the second stage of development - interactive elements are introduced on the existing web-site of the bank. The main goal is to motivate customers to visit the bank's website. The Bank offers such free tools as: calculators that allow you to calculate the loan, the schedule of repayment of the loan, also expects the bank' staff to facilitate the implementation of common tasks (Kisiel, 2007). The third stage allows banks to offer a full range of services and operations of the bank. For the first time, clients can manage their funds on accounts. All this thanks to the Internet. Establishing or terminating a deposit or checking transaction history is no longer a problem for the client. As a result, the bank becomes more reliable in the eyes of customers who prefer to use banking services over the Internet (Zaleska, M., 2007). The last stage of Internet banking development focuses on the fact that the bank uses the Internet for strategic purposes to collect and analyze customer information in order to sell its goods and services more effectively. Only at this stage, the bank offers an additional variety of investment services, and even insurance. While the bank's website is being turned into a portal, including financial information, stock quotes or other financial services that are available online (Kisiel, 2007). Banks, through modern technological solutions, offer new banking services and products adapted to take into account the individual needs of the customer. Banks offer customers the highest level of security through electronic signature, simple and strict authentication and encryption of data.

There are four business models of Internet banking («traditional bank», «virtual bank», «internet bank», «electronic financial supermarket»), the characteristics of which are shown in Figure 3.

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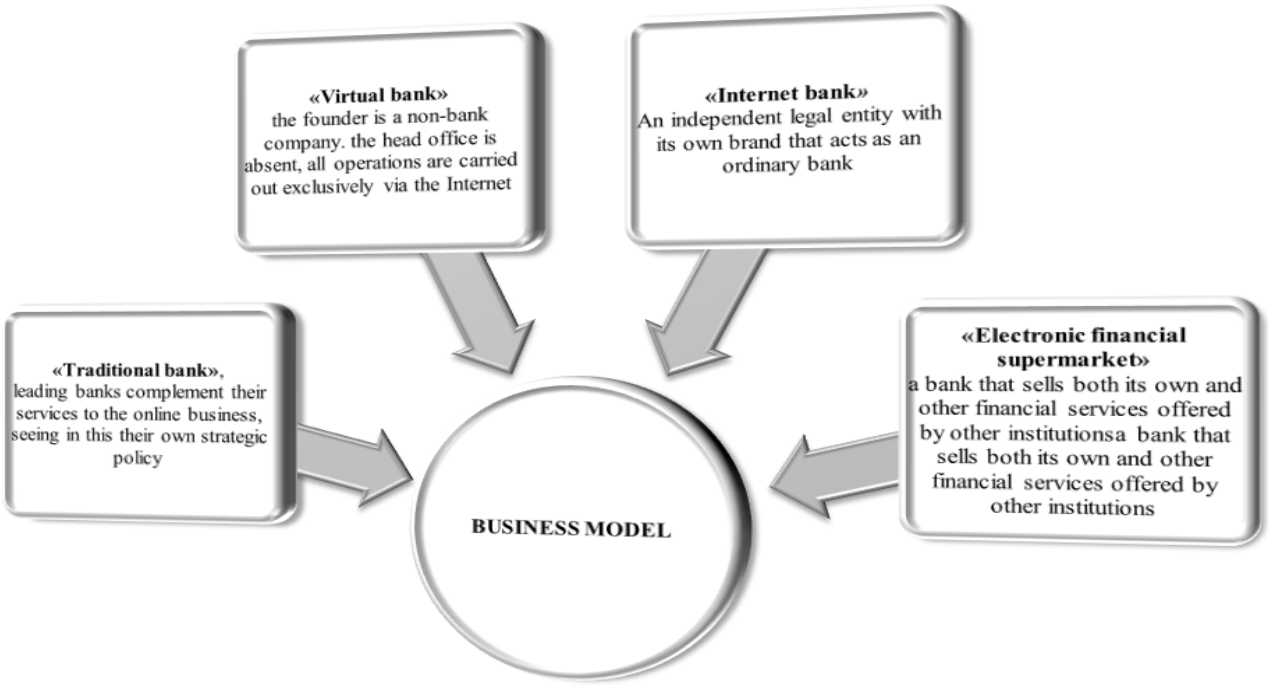

Fig. 3. Internet Banking Models

Source: built by the authors

Analyzing the world practice of electronic banking, Poland is choosen as an example. Bank Zachodni WBK is the third largest bank in Poland at the expense of its property. The Bank concentrates its activities on the management of assets, investments, leasing, factoring, insurance services and brokerage activities. There are about 900 offices in which more than 3 million clients are served. In the case of mobile banking, the bank BZ WBK offers a BZWBK24 mobile phone, with the ability to monitor accounts on the phone's desktop constantly. Mobile banking is based primarily on mobile applications BZWBK24 and PeoPay, which are characterized primarily as a free and convenient and understandable application. They allow you to transfer and control the funds on the account quickly and pay with NFC contactless. If the account does not exceed 50 zloty, then click «OK», while the amount over 50 zloty requires a 4-digit PIN. At the moment, this application provides great convenience, since there is no need to carry cash or a credit card. The growing popularity of these applications has led to an almost ten times increase in the number of deals in 2017 – more than 2177 million transactions, while in 2015 it was only 219,000. The number of mobile banking operations and the number of their active users in 2015–2017. shown in Figure 4.

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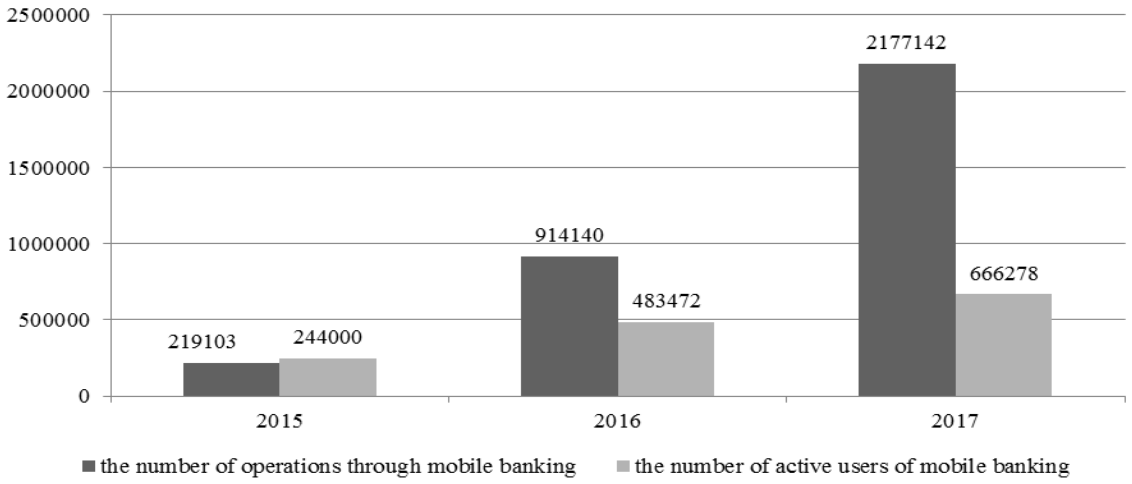

Fig. 4. The number of mobile banking operations and the number of their active users in 2015 – 2017

Source: own development based on data provided by BZWBK

When it comes to active mobile banking users, namely young people between the ages of 18 and 26, their number for the period under the study increased almost threefold. At the end of 2017 there were more than 666 thousand users, which is 422 thousand users more than in 2015.

In 2017, more than 2.8 million customers had access to Internet Bank. Compared to 2015, this figure is increasing annually by almost 100 thousand users. Of all clients having an agreement with a bank, BZWBK24 uses the Internet almost 60% at least once a month go in their savings accounts. The number of individual clients is shown in Figure 5.

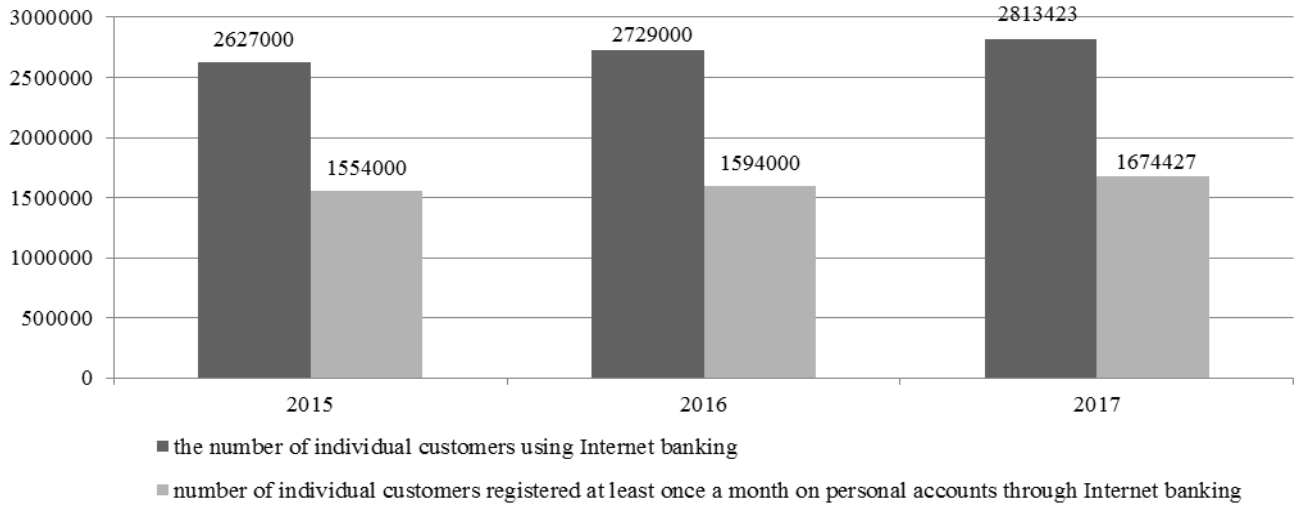

Fig. 5. Number of Individual Customers

Source: own development based on data provided by BZWBK

Among the digital banking services, most customers (63 %) use only online banking, and one in three combines Internet banking services with mobile banking. In contrast, only 4 % are those who support only their bank

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account with the help of mobile banking. Schematically depicts the structure of electronic banking clients in Figure 6.

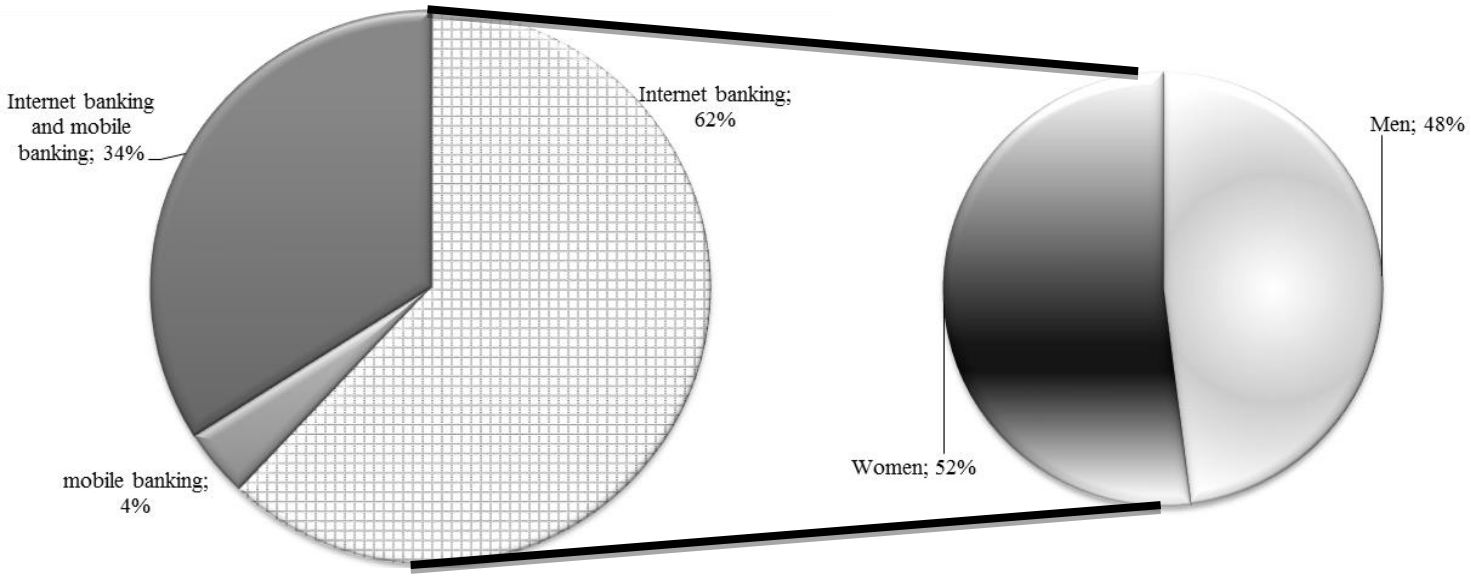

Fig. 6. Structure of electronic banking clients

Source: own development based on data provided by BZWBK.

Among the digitized clients of the Zachodni Bank, the majority is women, as shown in Figure 6. The largest age group of women is between the ages of 27 and 35. Immediately behind them a small group of people aged from 36 to 50 years. The number of clients registered on the BZWBK 24 Internet platform over the age of 50 can be compared with the number of clients aged from 18 to 26 years. Young clients are usually more ambitious, active, and above all innovative. Those who have reached the retirement age are much less interested in modern technologies.

It is also worth analyzing banks in Poland, for example, MBANK, PKO BP and Eurobank, which offer their customers the ability to use different types of online accounts, and the client, choosing Internet accounts, is controlled by the number of fees. Different packages on the example of the proposed banks (in comparison) are shown in Table 1.

Table 1. Comparison of subscription costs – SMS message

Peculiarity	MBANK			PKO BP	Euro bank	
Message number	I – 20 SMS	II 45 SMS	III 90 SMS	I – 40 SMS	Optimum 15 SMS	Premium 50 SMS
Charge	3,00 ZL	6,00 ZL	9,00 ZL	6,00 ZL	2.50 ZL	6,00 ZL

Source: own research based on (Dostęp do serwisy transakcyjnego iPKO oraz iPKO biznes, przeglądany 12.02.2018)

The largest fee from customers is traced to Eurobank – up to 9 zlotys. MBANK and RKO BP allow you to use mobile payments with your smartphone as a Blik service. The cost of SMS notification of mobile payments in the analyzed banks is different: PKO BP offers 0,25 zloty for 1 SMS, MBANK – r equires a fee of 0,35 zloty.

MBANK's customers have the largest selection of subscriptions. The 90 SMS package costs only 9 PLN, which is very beneficial for a potential client who is actively using Internet services and mobile banking. Eurobank's

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premium subscription is different from the other, so you can receive up to 50 SMS messages for 6 zł. Nevertheless, it allows the user to take advantage of the service - a financial manager.

According to research by the company Juniper Research, by the end of 2019 more than 1.75 billion mobile phone owners (every third inhabitant of the Earth) will use their gadgets for banking operations. By comparison, in 2014, about 800 million people used the services of mobile banking. Worldwide. At the same time, it should be noted that in Ukraine, the number of Internet users is increasing (The Statistics Portal).

In 2018, in Ukraine, it is ccounted up to 65 % of Internet users from the total number of inhabitants, while in developed countries this figure reaches 90 %. Experts predict that for 2-3 years there will be an active increase in the number of Internet users. Over the past two years, the offer of online banking from big banks has increased. Such a service appeared in Savings Bank, as well as Raiffeisen Bank Aval. Electronic banking is most widespread in the United States, where almost every major bank and the vast majority of medium and small banks provide their clients with remote account management via the Internet. In the US, the most famous banks, such as Bank of Internet USA, EverBank Direct, BankSimple and PerkStreet Financil, specialize in online banking services. The US Internet banking market is one of the most developed in the world. This primarily reflected in the fact that the US bank customer can get the maximum number of services via the Internet, all transactions in the account, purchase / sale of currency trading on the stock markets, deposit insurance, credit, access to personalized financial information and more. According to the research «comScore», in the US in the number of internet banking holders of deposits in the ten largest banks increased to 65 million. And just pay various bills through a network of about 66 % of US consumers (Chyb O., 2017). Table 2 shows the list of domestic banks that provide Internet banking services in modern conditions.

Table 2 Internet banking services of domestic banks

<table>
<tr><th>Bank's name</th><th>Internet banking system</th><th colspan="2">Opportunities</th></tr>
<tr><td>PrivatBank</td><td>Privat24</td><td rowspan="7">-view account statements;
-any types of payments;</td><td rowspan="4">-registration of deposit
-change of currency;
-refill a mobile phone account;
-additional services on payment cards.</td></tr>
<tr><td>Ukrsotsbank</td><td>Internet banking</td></tr>
<tr><td>Prominvestbank</td><td>PIB-ONLINE</td></tr>
<tr><td>Alfa Bank</td><td>My Alfa-Bank</td></tr>
<tr><td>OTP Bank</td><td>OTPdirekt</td><td>-deposit registration;
-currency exchange
- refill a mobile phone</td></tr>
<tr><td rowspan="3">UkrEximBank</td><td rowspan="3">Financial Portal</td><td>-currency exchange.</td></tr>
<tr><td>-mobile phone replenishment.</td></tr>
<tr><td>- replenishment and withdrawal of funds from a savings account.</td></tr>
</table>

Source: grouped by the authors

PrivatBank, the first Ukrainian bank to introduce Internet banking in its services, was held in 1998. Among the banks that are actively moving towards the development of Internet banking, one can distinguish PrivatBank, Ukreximbank, OTP Bank (Jesina, 2013).

Today, most experts consider mobile banking to be the most promising electronic channel for the delivery of banking services, because it allows you to implement an effective marketing concept «a bank that is always with you» (Vachnyk, 2003). An average client of a retail bank in developed countries should collaborate with him as follows: through a branch - 1-2 times a year; through the Call Center or the TV Banking System (IVR) – 5-10 times a month; through an ATM - 3-5 times a month; via the Internet - 7-10 times a month; through a mobile phone - 20-30 times a month.

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There are several main reasons that encourage banks to implement their online banking, namely: a significant demand for such a service; minimal cost; significant competitive advantage. Despite the fact that Internet banking has arisen relatively recently, in Western Europe, every fifth resident enjoys such a service. According to The Statistics Portal, today the number of users and the volume of Internet banking operations are driven by Norway – 90 % of the population, Finland – 86 %, Estonia – 81 %, United Kingdom – 58 %, USA – 57 %, Germany and Austria – 51 % (The Statistics Portal).

The forms of electronic banking provide the same range of services, but they also have key differences: when using mobile banking, access is only through a telephone and a tablet; access to Internet banking can be done through a stationary computer, a laptop, a tablet and a smartphone. The advantages and disadvantages of mobile banking and Internet banking in Table 3 are described in detail.

Table 3 Advantages and disadvantages of mobile banking and Internet banking for customers and banking institutions

Advantages		Disadvantages	
for customers	for banks	for customers	for banks
round-the-clock service regardless of where you are	expansion of the client base	inaccessibility in the case of technical malfunctions in the system	high cost of software development and support
ease of use and portability	increase in operating income	need to obtain relevant knowledge	increase the level of operational risks
the cost of service is much lower than the service at the department	strengthening of competitive positions in the market of banking services	inability to access in the absence of the Internet or mobile phone	in the event of frequent failures in the system, the probability of reputational risk increases
possibility of realization of a wide spectrum of services and constant control of accounts	reduction the cost of maintaining staff and departments	increase the risk of illegal obtaining of personal data by third parties	increase the likelihood of fraud and virus attacks
operationality of conducting transactions	expanding the range of services	nsufficient protection against fraudsters	dependence on Internet providers

Source: developed by the authors

In Ukraine, consumers appreciate the branching out of branches and ATMs, which indicates that they favor contact service. For them, the quality of service and service is important, despite the fact that among the trends of recent years is the reduction of bank branches and the number of staff through optimizing the costs of banks. At the same time, Internet marketing, mobile marketing and other multi-channel communications are increasing. Under these conditions, the role of marketing tools that influence the formation of a high level of quality of service for consumers (Rechetnikova I., Chapovalova E., 2017).

Among the reasons that hinder the development of e-banking in Ukraine (especially Internet banking and mobile banking), one can distinguish:
1) the absence of legislative acts regulating the relations between banks and their clients in the process of using electronic banking;
2) low level of trust of the part of clients (especially among the elderly) to technological innovations;
3) lack of high-speed access to the Internet, especially in rural areas.

Studies conclude that both internal and external factors significantly influence the performance of banks.There are number of explanatory variables that have been utilized to measure the performance of banks. (Xu et al., 2018; Kunitsyna et al., 2018).

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A significant factor inhibiting the development of innovative forms of e-banking is the financial and political situation in Ukraine, which creates unfavorable conditions for banking business, which leads to the liquidation of banking institutions and the withdrawal of foreign banks from the domestic financial services market (Sodoma R., 2018). Under such conditions, the share of banks actively investing in the development of advanced forms of banking services in our country is still insignificant.

Conclusions and perspectives of further research

The article proposes the basic factors for further development of Internet banking in Ukraine which will attract much more clients; increase speed and quality of service of client's cashless payments; develop functionality and services convenient and affordable for the clients; increase the safety of banking in general. (Shevchuk T., 2015). As a result of the study, it was found that the forms of electronic banking have undergone certain stages, which resulted in the emergence of effective and convenient tools that correlate with the advanced achievements in information technology.

Internet banking and mobile banking are creating new trends in the banking sector and become an obvious element without which functioning in the world around us is impossible. It brings with it a number of very important benefits not only for potential customers, but also for the bank. It provides customer contact with the bank through the use of the Internet. Mobile banking is the latest step in providing banking services. Its use is possible thanks to installed mobile phone banking applications.

Almost all banks that occupy leading positions in the market of banking services offer e-banking services, as it enables clients, without attending a branch of banks, to carry out a wide range of banking operations: to manage the volume of resources on their own account; exchange currency; make payments and transfers; pay for services of mobile communication, Internet, utilities, taxes, fines.

Therefore, further research should be aimed at developing an effective electronic tool that should absorb elements of existing banking products. The introduction of innovative forms of remote servicing expands the profile of traditional risks and creates new sources of their occurrence. That's why the process of identifying risks in the use of electronic banking, assessments and risk minimization techniques is a prospect for further research.

References

Bessonova E.; Domkhokova T. (2016). The technique of evaluating the efficiency of controlling adjusted for confectionary enterprises. *Economic Annals–XXI*, 157 (3-4(1)), 112–114. https://doi.org/10.21003/ea.V157-0035 17

Boiar, Andrii O.; Shmatkovska, Tetiana O.; Stashchuk, Olena V. (2018). Towards the theory of supranational finance, *Cogent Business & Management*, 5(1) http://doi.org/10.1080/23311975.2018.1482594

Chmutova I.; Vovk V.; Bezrodna O. (2017). Analytical tools to implement integrated bank financial management technologies. *Economic Annals–XXI*, 163 (1-2(1)), 95–99. https://doi.org/10.21003/ea.V163-20

Chyb, O. Rozvutok internet-bankingy v globalnomy seredovuchi [Development of Internet banking in the global environment] Retrieved from http://www.nbuv.gov.ua

Dostęp do serwisy transakcyjnego iPKO oraz iPKO biznes [Access to the iPKO and iPKO biznes transaction website]. Retrieved from http://www.pkobp.pl/aktualnosci/ogolnokrajowe/dostep-do-serwisu-transakcyjnego-ipko-oraz-ipko-biznes-zaktualizuj-przegladarke-na-wspierajaca-protokol-tls/

Gracheva, M. V. (2002). Elektronnuje bankovskuje uslugu: osobennosty upravlennja ryskamu [Electronic banking services: features of risk management]. *Bankovskuje technologuje*, 6, 20-29. Retrieved from http://www.finnews.ru/cur_an.php?idnws=73

Jesina, O. G. (2013). Internet-banking v Ukraini: sychasnyj stan, problem ta perspektyvy rozvutku [Internet banking in Ukraine: the current state, problems and prospects of development] . *Visnik socialno-ekonomichnuc doslidchen*, 1(48), 209-213. Retrieved from http://vsed.oneu.edu.ua/files/full/2013/vsed_48-2013.pdf

Kisiel, M. (2007). Internet a konkurencyjnosi bankow w Polsce [Internet and the competitiveness of banks in Polsce], Warszawa. Retrieved from http://www.pte.pl/pliki/2/19/rola_bankow_-_angielski%5B1%5D-1.pdf

Kunitsyna, N.; Britchenko, I.; Kunitsyn, I. 2018. Reputational risks, value of losses and financial sustainability of commercial banks. *Entrepreneurship and* Sustainability *Issues*, 5(4), 943-955. http://doi.org/10.9770/jesi.2018.5.4(17)

Powiadomienia SMS i EMAIL [SMS and EMAIL notifications]. Retrieved from https://www.pkobp.pl/bankowosc-elektroniczna/ipko/obsluga-rachunkow-i-lokat/e-wyciagi/powiadomienia-sms-i-e-mail/#/szczegoly-oferty/

Przewodnik finansowy nbp: Bankowosc internetowa i rozliczenia w sieci [Financial advisor nbp: Internet banking and online settlements). Retrieved from http://superbiz.se.pl/wiadomosci-biz/przewodnik-finansowy-bankowosc-internetowa-i-rozliczenia-w-sieci_309432.html

Rechetnikova, I.; Chapovalova, E. (2017). Marketyngovi instrymenty zabezpechennja jakosti obslugovuvannja na runky bankivskych poslych [Marketing tools for quality assurance in the banking services market]. *Marketing I menedjment innovacij*, Symu, 2, 47-56. http://doi.org/10.21272/mmi.2017.2-04

Sodoma, R.; Skhidnytska, H.; Shvorak, A.; Shmatkovska, T.; & Zhurakovska, I. (2018). Peculiarities of agrarian receipts as a modern financial tool [Peculiarities of agrarian receipts as a modern financial tool] . *Economic annals – XXI*, 169 (1-2), 46-49. https://doi.org/10.21003/ea.V169-09

Romanenko Y. A.; Chaplay I. V. (2017). Theoretical and methodological foundations subsystem brand management at the enterprise [Theoretical and methodological foundations subsystem brand management at the enterprise] . *Scientific bulletin of Polissia*, 2., 156—163 Retrieved from http://journals.uran.ua/nvp_chntu/article/view/110268

Shevchuk T. (2015). Problemy ta osoblyvosti rozvytku zyfrovych bankivskych technologij [Problems and development features of digital banking technologies). *Financial and credit activity: problems of theory and practice*, 1(18), 249-255. https://doi.org/10.18371/fcaptp.v1i18.46549

The Statistics Portal [The Statistics Portal). Retrieved from http://www.statista.com/statistics/222286/online-banking-penetration-in-leading-european-countries/

Tofan I. N., Ahres O. H., Shmatkovska T. O. (2017). Problems in administration of real estate tax other than land in Ukraine [Problems in administration of real estate tax other than land in Ukraine]. *Scientific bulletin of Polissia*, 3(11), 148-153. Retrieved from http://nvp.stu.cn.ua/uk/component/k2/item/823-tofan-i-n-ahres-o-h-shmatkovska-t-o-problems-in-administration-of-tax-on-real-estate-other-than-land-in-ukraine.html

Tsymbaliuk, I. O.; Shmatkovska, T. O.; & Shulyk, Y.V. (2017). Tax alternatives to implement the tax capacity of internet activity in Ukraine [Tax alternatives to implement the tax capacity of internet activity in Ukraine]**.** *Financial and credit activity: problems of theory and practice*, Kharkiv, 22, 336-344. Retrieved from http://fkd.org.ua/article/view/110049

Vachnyk, S. V. (2003). Perspektyve dustancinogo obslygowywannja klijentiv v rezymi realnogo chasy dlja bankiv Ukraine [The prospects of remote customer service in real time for banks in Ukraine]. *Problemu I perspektyvu rozvytky bankivskoji systemy Ukrainu* . Symu. 184-185. Retrieved from http://zavantag.com/docs/483/index-11859-1.html?page=39

Wojciechowska–Filipek, S. (2010). Technologia informacyjna w uslugach bankowosci elektronicznej, [Information technology in electronic banking services] Warszawa. 55 Retrieved from http://www.wne.sggw.pl/czasopisma/pdf/PEFIM_2010_T3_nr52.pdf

Xu, J. X.; Naiwen, L.; Ahmad, M. I. (2018). Banking performance of China and Pakistan, *Entrepreneurship and Sustainability Issues*, 5(4), 929-942. http://doi.org/10.9770/jesi.2018.5.4(16)

Yakubiv, V. M.; Horohotska, N. I.; Yakubiv, R. D. (2015). Upravlinska model zabezpechennya rozvytku silskogospodarskyx pidpryyemstv shltaxom vprovadzhennya dyversyfikacijnyx procesiv [Administrative model of ensuring the development of agricultural enterprises

through diversification processes implementation]. *Actual problems of economics,* 8(170), 58-66. Retrieved from https://www.researchgate.net/publication/298698043_Administrative_model_of_ensuring_the_development_of_agricultural_enterprises_through_diversification_processes_implementation

Zaleska, M. (2007). Wspolczesna bankowosc, [Contemporary banking] Warszawa Retrieved from https://cyberleninka.ru/article/v/standartizatsiya-bankovskih-produktov-uslug-i-kanalov-ih-rasprostraneniya

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DEVELOPING SOCIAL ENTREPRENEURSHIP: A STUDY OF COMMUNITY PERCEPTION IN INDONESIA

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Abstract. Nowadays, the understanding of social entrepreneurship is still diverse. This study aims to create a model of social entrepreneurship and the factors shaping it. The results of this study indicated that there was a direct, positive influence of the organizational environment, social environment, individual characteristic, experience, and family demands for entrepreneurship, while the economic environment, education and training had no significant influence on the entrepreneurship. Furthermore, the results of the analysis proved that the organizational environment, variables, social environment, economic environment, individual characteristic, education and training, experience, and family demands indirectly influenced the social entrepreneurship through entrepreneurship variables as the intervening variables, except for the economic environment variable. The research method used was Structural Equation Model (SEM). SEM is a multivariate analysis used to analyze the relationships between variables in a complex manner. Authors used non-probabilistic sampling with 320 respondents. Authors strive to examine the role of government in providing capital, and universities in creating new social entrepreneurs that contribute to the tightening of social problems in the further research.

Keywords: Entrepreneurship; Social Entrepreneurship; Indonesia

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JEL Classification: M14, M20

1. Introduction

Entrepreneurship is an art and science that has contributed greatly to the business world. The traditional theory of entrepreneurship states that entrepreneur is someone who creates a new business in a risky and uncertain environment for profit purpose (Kirzner, 1973; Abdulmelike, 2017; Daud et al., 2018). The traditional theories emphasize entrepreneurship in terms of risk-oriented and individual profit seeking. However, along with developments and changes in the business environment, there is a shift in understanding of entrepreneurship. Now it does not only emphasize achieving individual profit, but also focuses on how entrepreneurial activities can

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contribute socially (Mair & Noboa, 2003; Abdulmelike, 2017; Myres et al., 2018; Buchko, 2018; Daud et al., 2018; Kimmit & Muñoz, 2018; European Commission, 2018; Sannikova & Brante, 2018).

Prabhu (1999) described social entrepreneurs as people who make or manage innovative entrepreneurial organizations, and whose main mission is social changes and development of community groups. According to him, social entrepreneurship is the process of construction, evaluation, and the pursuit of opportunities for transformative, energetic and dedicated social changes (Kimmit & Muñoz, 2018). According to Sharir and Lerner (2006), social entrepreneurs act as agents of change to create and maintain social values without being limited to the existing resources. The social entrepreneurs aim to create value in the form of transformational changes that will benefit the poor and ultimately, the wider community (Abdulmelike, 2017; Myres et al., 2018; Buchko, 2018; Kimmit & Muñoz, 2018; Sannikova & Brante, 2018; Prodanov, 2018).

Although social entrepreneurship has many similarities to traditional entrepreneurship; for example, these two forms of entrepreneurship together create a new activity or organization in the social environment. The key differences between these two forms of entrepreneurship are: owners or actors of social entrepreneurship are not merely encouraged by the desire to gain profit, but, more importantly, they strive to solve social problems in their environment and to create social values. With a focus on social changes and social development, the social entrepreneurs have a significant impact on the society, both socially and economically (Mair & Noboa, 2003; Kimmit & Muñoz, 2018). Hibbert et al. (2005) revealed that social entrepreneurship is the use of entrepreneurial behavior, which tends to be more oriented to the achievement of social purposes and does not prioritize the profit, or if there is any profit, it is used for social purposes.

The results of the study by Mair and Noboa (2003) showed that the interest in social entrepreneurship came from several factors influencing the entrepreneurial behavior. They added that the model of social entrepreneurship, which was specifically related to the social entrepreneurship intention, was influenced by cognitive factors (character and moral) and individual characteristic factors (emotions and empathy), making the social entrepreneur focuses on helping others (Prodanov, 2018). While Mort (2003) revealed that the factors influencing the entrepreneurship were not only limited to individual factors, because they were not enough to picturize the entrepreneurial process as a whole. He also further mentioned that it was because the entrepreneurial activity also involved organizations, economic environment, and social support, resulting in the environmental factors to be external factors which could complement the entrepreneurial activities. The results of Nicholls (2006) study showed that based on the level of organizational, the social entrepreneurship could be seen from two elements. The first was to focus on social mission, which reflected in the context and output of the actions according to the social values showed in the surrounding environment after the organization carried out its activities. The second was the operational process - the approach to action with an 'entrepreneurial' component. These components indicated the individual behavior of an entrepreneur. From the results of these studies, it can be seen that external factors influence entrepreneurship such as: individual characteristicistics, organizational, social, and economic environment also have a relationship with the formation of social entrepreneurship model. Based on these explanations, there is a strong belief that there is a connection between these external factors influencing the formation of social entrepreneurship model (Kimmit & Muñoz, 2018).

A previous research by Priyanto (2004) explained that internal factors of entrepreneurship were the aspects that proposed and shaped the spirit of entrepreneurship. Entrepreneurship is basically for everyone because it can be learned. According to Drucker (1996), every person who has the courage to make decisions can learn to become and behave like an entrepreneur. It is because entrepreneurship is more of a behavior than a personality phenomenon, which basically lies in the concepts and theories, not an intuition (Abdulmelike, 2017; Sannikova & Brante, 2018; Daud et al., 2018). Further, the entrepreneurial spirit of a person can be formed through several aspects, including: individual characteristic, education and training, experience, parenting, and family demands.

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These factors are the internal factors that can also shape the spirit of social entrepreneurship (Hisrich & Peters, 1992; Kimmit & Muñoz, 2018; Daud et al., 2018).

Based on the research results explained previously, in a broad outline, it can be concluded that social entrepreneurship is one of the positive ways or alternatives in overcoming various social problems these days. Research studies on social entrepreneurship are interesting, and need to be carried out. However, it has not been discussed on how the entrepreneurship model can be created, the linkages between entrepreneurial variables in general and social entrepreneurship have not yet emerged. Previous researches considered entrepreneurship as a separate part of social entrepreneurship (McMullen, 2011). On the other hand, the results of a study by Estrin et al. (2013) showed that the high number of commercial entrepreneurs in one country will determine the number of social entrepreneurs. Therefore, it can be concluded that there is a link between commercial entrepreneurship and social entrepreneurship (Myres et al., 2018).

It is explained formerly that there is an inconsistency in the results between McMullen's (2011) and Estrin et al.'s (2013) studies, which makes it a space for this present study. A question is then followed whether entrepreneurship is related to social entrepreneurship or not. The answer of this question is what this research is about. Thus, the main objective of this study is to understand whether there is a direct link between entrepreneurship and social entrepreneurship. Entrepreneurship will be the antecedent of the social entrepreneurship.

The method that can be used to analyze the Construction of Social Entrepreneurship Model is the Structural Equation Modeling (SEM) method. According to Santoso (2010), SEM analysis is a complex multivariate analysis as it involves a number of interconnected independent and dependent variables to form a model. However, it cannot simply be concluded that there is a dependent and independent variable in SEM because an independent variable can be dependent on another relationship.

2. Literature Review and Hypothesis Development

2.1 Entrepreneurship

Entrepreneurship is considered as a spirit, ability, attitude, individual behavior in handling business or activities that lead to efforts to find, create, and implement work methods, technology and new products by increasing efficiency in order to provide better services and or gain greater profits (Drucker, 1996; Siagian & Ashafani, 1995; Riyanti, 2003; Prodanov, 2018; Buchko, 2018; Shannikova & Brante, 2018; Shin, 2018). Based on this definition, it indicates that entrepreneurship is the ability to create something new and different through creative thinking and innovative action to create opportunities in facing life's challenges. This ability is based on the nature, characteristics, and character of someone who has the will to realize the innovative ideas into the real world creatively. It is a process of identifying, developing, and bringing visions into life. This vision can be in the form of innovative ideas, opportunities, and better ways of doing things. The final result of the process is the creation of new businesses formed in conditions of risks or uncertainties (European Commission, 2018).

2.2 External Factors of Entrepreneurship

2.2.1 Organizational Environment

Organizational environment refers to the result of actions in an organizational climate that can influence the behavior of its members (Wijono, 2005; Abdulmelike, 2017; Buchko, 2018; Prodanov, 2018). Someone who lives and is raised in a conducive and challenging, open and flexible organizational environment will be a successful entrepreneur who has a large motivation, is independent and responsive to risks (Buchko, 2018; Prodanov, 2018).

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2.2.2 Social Environment

Social environment refers to a social climate exists around individual groups and is based on mutually agreed upon personal values (Reppeti, 2007; Kimmit & Muñoz, 2018). Social factors (such as network and support from the socio-political elite), economic factors (such as the availability of capital, aggregate indicators, recession and unemployment), political conditions (such as support from other institutions, regulations) and infrastructure factors (such as the education system, labor market, access to information and availability of assets) will greatly influences one's intentionality and decision making in conducting business activities (Mazzarol et al., 1999; Prodanov, 2018).

2.2.3 Economic Environment

Economic environment refers to an economic condition in an organizational environment. High unemployment is one of the factors that influence a person to create his own employment by becoming entrepreneurs (Sadoulet & Janvry, 1995; Buchko, 2018; Prodanov, 2018). The level of economic growth of a country also determines the development of entrepreneurship (Kadarsih et al, 2013; Abdulmelike, 2017; Buchko, 2018; Prodanov, 2018).

2.3 Internal Factors of Entrepreneurship

2.3.1 Individual Characteristic

Individual characteristic refers to a tendency that characterizes individuals, which distinguishes an individual from other individuals and becomes the basis for behavior (Crant, 2000; Abdulmelike, 2017; Shin, 2018; Kimmit & Muñoz, 2018). The character of entrepreneurs can be seen based on six characteristics of entrepreneurs, namely confidence, task and results-oriented, courage to take risks, leadership, originality, future-oriented, and that the characteristics of entrepreneurs and the aspects of entrepreneurship are equivalent (Meredith et al., 1996; Myres et al., 2018; Shin, 2018; Buchko, 2018; Prodanov, 2018; Mohapatra et al., 2018).

2.3.2 Education and Training

A person's entrepreneurial spirit can be formed through several aspects, and some of them are through education and work history (Hisrich & Peters, 1992; Buchko, 2018; Kimmit & Muñoz, 2018). The only battle to make humans with moral, attitude and entrepreneurial skills is through education. Education gives many insights for individuals to be more confident; able to choose and make right decisions; increase creativity and innovation; foster moral, character, and intellectual; and improve the quality of other human resources, so that they are finally able to stand on their feet (Soemanto, 2002; Sannikova & Brante, 2018; European Commission, 2018).

2.3.3 Experience

Learning experience refers to an interaction, between those who learn with their environment, where they can react to stimuli they receive (Soekanto, 1986; Kimmit & Muñoz, 2018; Shin, 2018; Mohapatra et al., 2018; European Commission, 2018; Gandhi & Raina, 2018). Someone's experience will contribute to their interests and hopes to learn more. Based on the organizational context, work experience of employees in carrying out tasks in an organization plays a very important role (Dahama & Bhatnagar, 1980; Gandhi & Raina, 2018).

2.3.4 Family Demands

Family demands play a significant role in job selection, although this is also, sometimes, not realized by the respective individual (Mustofa, 1996; Buchko, 2018). It can be a driving force for individuals to do their jobs including entrepreneurship (Greenhaus & Singh, 2003; Prodanov, 2018).

2.4 Social Entrepreneurship

Social entrepreneurship refers to an effort to create innovative solutions to overcome urgent social problems by working on the ideas, capacity, resources, and social agreements, so that sustainable social change can occur (Alvord et al., 2004; Bornstein, 2004; Thompson et al., 2000; Abdulmelike, 2017; Daud et al., 2018).

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2.5 Hypothesis Development

2.5.1 The Influence of Environment towards Entrepreneurship

Organizational environment refers to the result of actions in an organizational climate that can influence the behavior of its members (Wijono, 2005; Abdulmelike, 2017; Buchko, 2018; Prodanov, 2018). Someone who lives and is raised in a conducive and challenging, open and flexible organizational environment will be a successful entrepreneur who has a large motivation, is independent and responsive to risks. The strategies and plans implemented, existing financial resources, industry sector and business format will influence one's entrepreneurial behavior (Watson & Scott, 1988; Shin, 2018). In addition, social environment is a social climate exists around individual groups and is based on agreed personal values (Reppeti, 2007; Buchko, 2018). Lambing and Kuehl (2000) stated that a person's level of entrepreneurship varies greatly according to the culture in which he has a social environment. Meanwhile, the economic environment refers to the economic conditions within the organizational environment (Sadoulet & Janvry, 1995; Abdulmelike, 2017). As stated by Kadarsih et al. (2013), the level of economic growth of a country also determines the development of entrepreneurship. Individual characteristics are the tendencies that characterize individuals who differentiate them from other individuals and become the basis of behavior (Crant, 2000; Crant, 2000; Abdulmelike, 2017; Shin, 2018; Kimmit & Muñoz, 2018). Meredith et al. (1996) compiled the entrepreneurial characteristics based on six entrepreneurial characteristics and stated that entrepreneurial characteristics with entrepreneurial aspects were equivalent. According to Hisrich and Peters (1992), a person's entrepreneurial spirit can be formed through several aspects, such as through education, and work history. Training is a learning process which utilizes several methodological techniques to improve skills and abilities of one's job (Nasution, 2003; Buchko, 2018; Kimmit & Muñoz, 2018). The importance of education in fostering the spirit of entrepreneurship is also stated by Zimmerer (2002). Dahama and Bhatnagar (1980) explained that a person's experience will contribute to his interests and hopes to learn more. Alwi (2001) also added that experience is the level of mastery of a person's knowledge and skills which can be measured from a person's work period. Likewise, in the context of entrepreneurship, the more entrepreneurial experiences a person has, the better the person will be to master his work, resulting him to finish his job well. Finally, the last is variable family demands. According to Mustofa (1996), family demands play a significant role in job selection, although this is also, sometimes, not realized by the respective individuals. Further, the entrepreneurial behavior of street vendors were highly related to family demand factors. Family demands are the amount of energy, time, and roles needed to handle the fulfillment of household needs and tasks (Greenhaus & Singh, 2003; Prodanov, 2018). Family demands can be a driver for individuals to do their jobs including entrepreneurship. From the description above, it can be explained that these factors can influence entrepreneurship.

H1: Organizational, social, and economic environment, individual characteristic, education and training, experience, and family demands influence entrepreneurship.

2.5.2 The Influence of Environment towards Social Entrepreneurship

According to the definition, social entrepreneurship refers to a social innovation that aims to create social value generated through a collaboration of a group of people and organizations from a social environment that influences a social entrepreneurship (Hubbard, 2010; Abdulmelike, 2017; Buchko, 2018; Prodanov, 2018). Experts in social entrepreneurship, Dees (1998), stated that social entrepreneurship is a combination of great enthusiasm in social mission with discipline, innovation, and determination as what customary in the business world is. Furthermore, Dees (1998) explained that social entrepreneurship is the use of innovation to create an economic activity that has social values from a combination of resources to get the opportunities by leading to the formation of organizations and or practices produced and making social changes, resulting it to be impossible to be separated from the activities in the economic environment. Individual characteristics can be a determinant of social entrepreneurial intention in a person (Prieto, 2011; Abdulmelike, 2017; Shin, 2018; Kimmit & Muñoz, 2018). The external and internal factors include organizational environment, social environment, economic environment, individual characteristic, education and training, experience, and family demands that shape entrepreneurship (Hisrich & Peters, 1992; Abdulmelike, 2017; Buchko, 2018; Prodanov, 2018; Kimmit & Muñoz,

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2018; Wijono, 2005; Reppeti, 2007). This is also in line with Hulgard's (2010) opinion that there is a link between entrepreneurship and social entrepreneurship. Therefore, a hypothesis that can be proposed is as follows:

H2: Organizational environment, organizational environment variables, economic environment variables, individual characteristic, education and training, experience, and family demands influence social entrepreneurship.

2.5.3 The Influence of Entrepreneurship towards Social Entrepreneurship

Entrepreneurship as a basic concept can be considered as an intervening variable between the influence of external and internal factors on social entrepreneurship (Kimmit & Muñoz, 2018; Daud et al., 2018). This is supported by the research conducted by McMullen (2011) that previous researches looked at entrepreneurship as an integral part of social entrepreneurship.

H3: Entrepreneurship influences social entrepreneurship.

2.5.4 The Influence of External and Internal Environment towards Social Entrepreneurship with Entrepreneurship as an Intervening Variable

Estrin et al. (2013) stated that the higher the number of commercial entrepreneurs in a country, the higher the number of social entrepreneurs. In addition, Gandhi and Raina (2018) also explained that social entrepreneurship is such an effort to create "Social Wealth", so that there is a strong attachment between the social entrepreneurial actors and the community groups assisted. According to Alvord (2002), the intention of social entrepreneurship may come from business entrepreneurial activities, ideas for creating social values and benefits, identifying social problems, or creating activities that can contribute to a social environment which may come from one person. However, it still requires resources, volunteers, government support, and donations (European Commission, 2018; Kimmit & Muñoz, 2018; Sannikova & Brante, 2018).

H4: Organizational environment, social environment, economic environment, individual characteristic, education and training, experience, and family demands influence social entrepreneurship with entrepreneurship as an intervening variable.

2. Measurement of Variables

The variables used in the study are divided into latent variables and empirical indicators, which can be seen in Table 1.

Table 1. Latent Variables and Empirical Indicators

Latent Variables	Empirical Indicators
Organizational Environment (X1)	1. Involvement in a decision-making process (X1.1) 2. Trust (X1.2) 3. Cooperation (X1.3) 4. Attitude in dealing and resolving problems (X1.4) 5. Leader feedback (X1.5) 6. Performance evaluation (X1.6)
Social Environment (X2)	1. Acceptable values (X2.1) 2. Networking (X2.2) 3. Culture (X2.3) 4. Lifestyle (X2.4) 5. Social class (X2.5) 6. Applicable laws (X2.6)
Economic Environment (X3)	1. Unemployment rate (X3.1) 2. Availability of capital (X3.2) 3. Interest rate (X3.3) 4. Availability of inputs / raw materials (X3.4) 5. Economic growth rate (X3.5)
Individual characteristic (X4)	1. Confidence (X4.1) 2. Tenacity (X4.2)

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	3. Leadership (X4.3) 4. Originality (X4.4) 5. Future-oriented (X4.5)
Education and Training (X5)	1. Increased knowledge (X5.1) 2. Improved individual skills along with technological development (X5.2) 3. Ability to solve operational problems (X5.3) 4. Stimulating accuracy of decision-making (X5.4) 5. Increased workability (X5.5)
Experience (X6)	1. Length of time of entrepreneurship (X6.1) 2. Level of knowledge owned (X6.2) 3. Level of technical skills and abilities, to assess the abilities in technical works implementation (X6.3) 4. Able to face difficulties at work (X6.4) 5. Able to manage the conflicts at work (X6.5)
Family Demands (X7)	1. Number of dependent family members (X7.1) 2. Composition of family members (X7.2) 3. Meeting the economic needs of the family (X7.3) 4. Family time demands (X7.4) 5. Attention and encouragement from the family (X7.5)
Entrepreneurship (Y1)	1. Risk taking (Y1.1) 2. Taking advantage of opportunities (Y1.2) 3. Creating a new business (Y1.3) 4. Creative (Y1.4) 5. Innovative approach (Y1.5) 6. Independent (Y1.6)
Social Entrepreneurship (Y2)	1. Creating social value (Y2.1) 2. Making social changes (Y2.2) 3. Economic activity (Y2.3) 4. Community empowerment (Y2.4) 5. Resource mobilization (Y2.5)

Source: the authors

3. Research Method

The use of SEM as a form of analysis tool, besides being based on the reasons for the complexity of the model used, is also based on the limitations of multidimensional analysis tools used in quantitative research, such as multiple regression, factor analysis, discriminant analysts and others. SEM examines a series of interdependent relationships between variables simultaneously. This technique is especially useful when the independent variables are in the next equation. In SEM, researchers can carry out three activities simultaneously, namely examining the validity and reliability of the instrument, obtaining a relationship model that is useful for estimation (Gozali, 2014). The population of this study were 1570 people. The sample used were 320 respondents (Salatiga City = 116; Demak Regency = 204). The population was taken from the beneficiaries of social entrepreneurial benefits.

4. Data Analysis and Findings

4.1 Data Analysis

The overall results of the questionnaire are more than 0.1156. Therefore, a valid questionnaire could be based on the significance value of r count> r table. This resulted in the valid questions, which could be used for analysis. Further, the results of the analysis showed that the reliability test value is more than 0.60 for all variables studied.

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4.2 Model and SEM Equation Conversion

Confirmatory factor analysis (CFA) examined whether the actions of the construct are consistent with a researcher's understanding of the nature of the construct or factor. Thus, the purpose of confirmatory factor analysis was to examine whether the data could be used in the hypothesis measurement model (Harrington, 2009). In Figure 1 CFA of the research variables is presented.

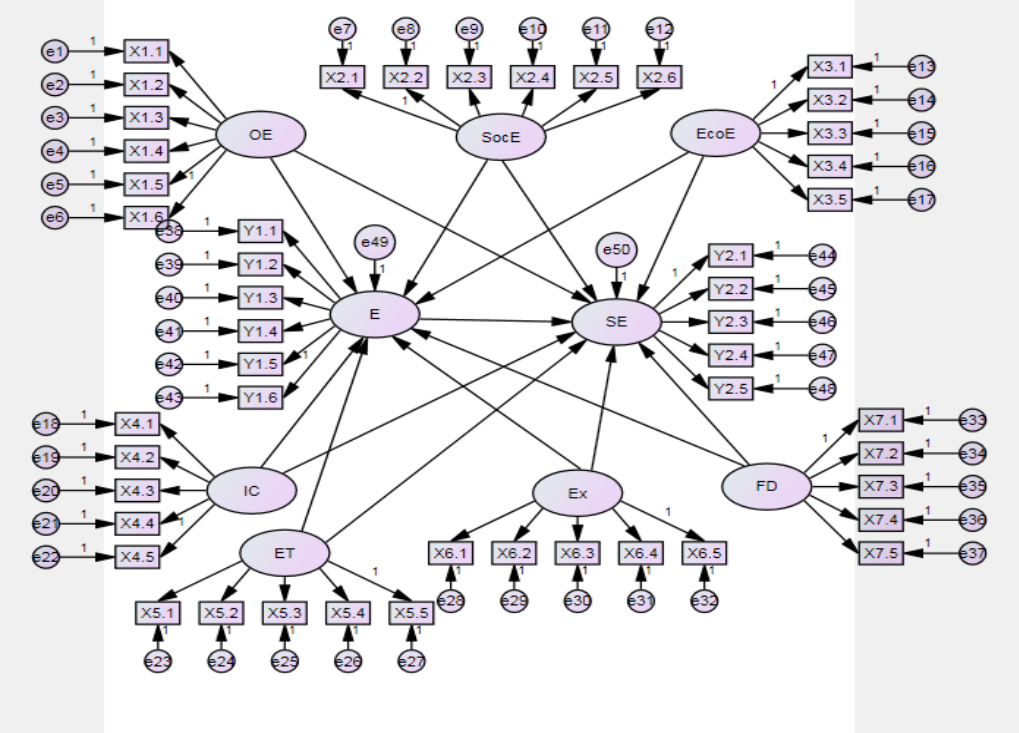

Figure 1. Confirmatory Factor Analysis of the Research Variables
Source: the authors

4.3 SEM Assumption Test

4.3.1 Outliers Test

The examination of multivariate outliers was carried out by using the Mahalanobis criteria at the level of p <0.001. Mahalanobis distance (*Md*) was evaluated using χ^2 at the free degree of the number of parameters in the model used, namely 1065 where the statistical table is 990.24. The decision-making rules are: if the *Md* from the observation point is > 990.24, then it shows that the observation point is an outlier, whereas if the *Md* from the observation point is < 990.24, then it shows that the observation point is not an outlier. Based on the Mahalanobis distance table, it can be seen that the observation point has an *Md* value between 61.672 to 205.233 for which all of these values are smaller than 990.24. Therefore, it could be concluded that all observation points were not outliers. Thus, the assumption of outliers was fulfilled.

4.3.2 Normality Test

AMOS output shows that the CR Multivariate Normality value of 95.079 is greater than the required value of 1.96. Thus, the assumption of normality had not been fulfilled. However, based on the central limit argument, if the sample was larger, the statistics will be normally distributed. With a sample size of 100, the data was considered to fulfill the central limit argument. Therefore, the assumption of normality of data was not critical and could be ignored. After the structural model was made, the next step was to test it. The goodness of fit test must

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be done to ensure that the structured model prepared could explain the direction of the relationship and the influences appropriately and did not cause estimation biases. The result can be seen in Table 2.

Table 2. Result of Overall Goodness of Fit Test

Criteria	Cut-of value	Result	Conclusion
Chi Square	Small	2906.225	Not Fit
p-value	ε 0.05	0.00	
CMIN/DF	≤ 2.00	1.729	Good Fit
RMSEA	≤ 0.08	0.078	Good Fit
GFI	ε 0.90	0.664	Not Fit
AGFI	ε 0.90	0.629	Not Fit
TLI	ε 0.95	0.560	Not Fit
CFI	ε 0.95	0.585	Not Fit

Source: the authors

The results of the overall goodness of fit, based on the figure and the table, it shows that the 2 criteria, namely CMIN / DF, RMSEA, show good models. According to Gozali (2014), the best criteria used as an indication of the goodness of fit of the model was the value of Chi Square / DF to be less than 2, and RMSEA to be below 0.08. In this study, the value of the CMIN / DF and RMSEA have met the cut-off value. Therefore, the SEM model in this study is suitable and feasible to use which also result in further interpretation for further discussion. If two or more of the entire GOF used have shown a good fit, the model is considered good.

4.4 Analysis of The Influence of Entrepreneurship towards Social Entrepreneurship

The structural model presents the relationship between the research variables. The structural model coefficient shows the relationship between variables. There is a significant influence if the P-value is < 0.05. In the SEM, there are two influences which are direct and indirect influences. The following figure 2 depits the results of the analysis of direct and indirect influence.

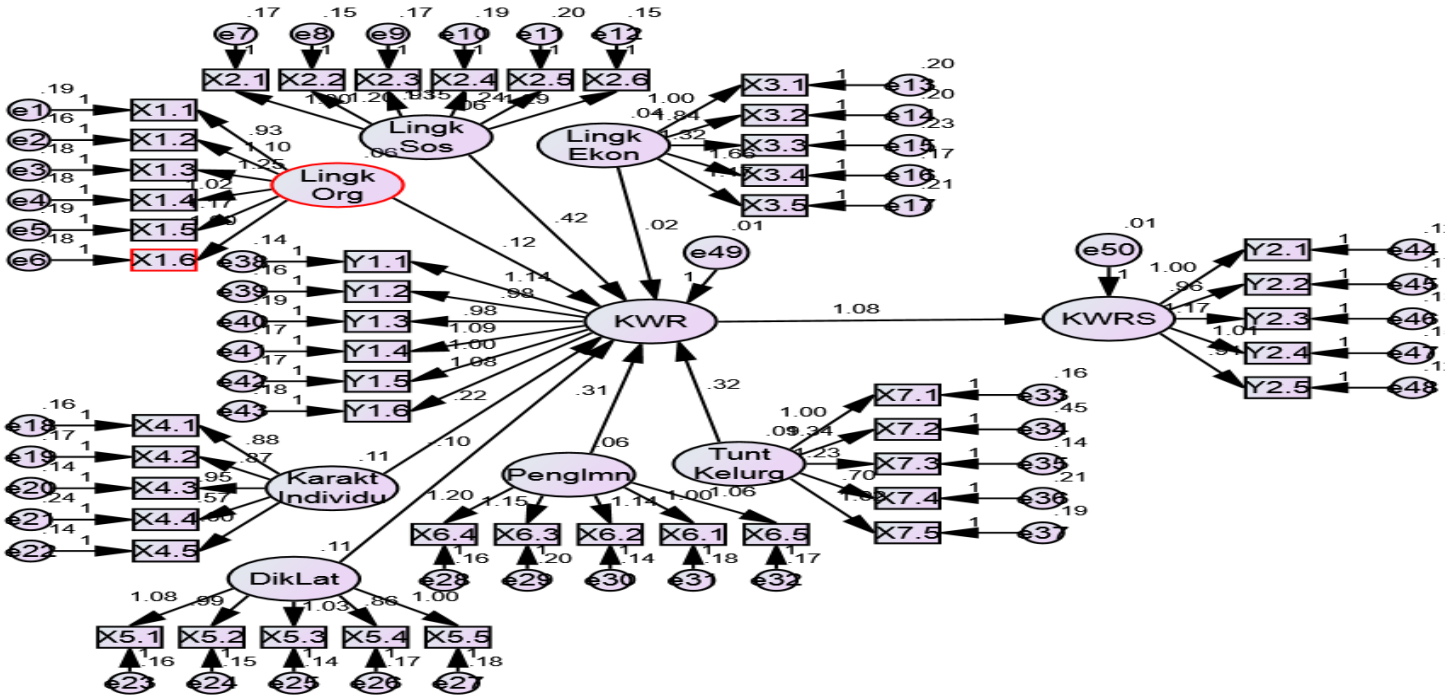

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Figure 2. The Full structural equation model
Source: the authors

Notes:

KWR	: Entrepreneurship (E)
KWRS	: Social Entrepreneurship (SE)
Lingk Org	: Organizational Environment (OE)
Lingk Sos	: Social Environment (SocE)
Lingk Ekon	: Economic Environment (EcoE)
Karakt Individu	: Individual Characteristic (IC)
DikLat	: Education and Training (ET)
Penglmn	: Experience (Ex)
Tunt Kelurg	: Family Demands (FD)

Based on the results of the indirect influence of social entrepreneurship, it shows that it is not significant. It indicated that the entrepreneurship variable was not the intervening variable. The previous researches looked at entrepreneurship as a separate part of social entrepreneurship (McMullen, 2011; Kimmit & Muñoz, 2018; Daud et al., 2018). In accordance with the description, this research was done as an attempt to conduct an in-depth study of how to build a social entrepreneurship model (Sannikova & Brante, 2018). The results of the research conducted had answered the research problem significantly. Based on the analysis, the second and third model could be proposed where the second model would examine the influence of the external environment on social entrepreneurship, and the third model would examine the influence of the external environment on social entrepreneurship by mediating the entrepreneurship variables as the intervening variables. The second model results are the direct influence of external and internal variables, which include organizational environment variables, social environment, economic environment, individual characteristic, education and training, experience, and family demands influencing the social entrepreneurship, except the organizational environment. Then, the third step was to examine the influence of the organizational environment, social environment, economic environment, individual characteristic, education and training, experience, and family demands toward the social entrepreneurship with the entrepreneurship variables as intervening variables. The direct influence of entrepreneurship on social entrepreneurship, which shows that the influence of entrepreneurial relations on social entrepreneurship is significant and positive. The results of this study are supported by the results of the study by Estrin et al. (2013) and Myres et al. (2018) which showed that the high number of commercial entrepreneurs in one country will determine the number of social entrepreneurs. Therefore, it could be concluded that there was a link between entrepreneurship and social entrepreneurship (Abdulmelike, 2017; Myres et al., 2018; Buchko, 2018; Kimmit & Muñoz, 2018; Sannikova & Brante, 2018; Prodanov, 2018; Shin, 2018; Daud et al., 2018; European Commission, 2018; Gandhi & Raina, 2018). Furthermore, based on the results of the analysis of the indirect influences of organizational environment variable, social environment, economic environment, individual characteristic, education and training, experience, and family demands on social entrepreneurship with entrepreneurship variables as the intervening variables, it shows that it has a significant influence, except economic environment variables. Based on the analysis of direct and indirect influences, the empirical model as the third model shows that the entrepreneurship variable was able to function as an intervening variable that mediates the relationship of independent variables with the social entrepreneurship. Likewise, based on the SEM analysis, the independent variable had an influence on social entrepreneurship, with the entrepreneurship variable as the intervening variable. However, there was one economic environment variable, that did not have a significant influence on the variables of social entrepreneurship. Further, the third model shows that the influence of entrepreneurship variable on the social entrepreneurship is significant. This result filled in the research gap of this research. It claims that there are inconsistencies between the research results by McMullen (2011) and Estrin et al. (2013). This was also in line with the opinion of Peredo and McLean (2006) explaining that social entrepreneurship is formed when individuals or groups of people: (1) aim to create social value, either exclusively or at least in some acceptable ways; (2) demonstrate the capacity to recognize and take advantage of opportunities to create values; (3) create innovation, starting from direct discovery or by adapting ways to create and or

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distribute social values; (4) willing to accept the level of risk above the average in creating and spreading social values.

Conclusions

First, based on the results of the social entrepreneurship model analysis, it was found that the direct influence of the organizational environment, social environment, individual characteristic, experience, and family demands was significant and positive towards entrepreneurship, while the economic environment and training education had no significant influence on entrepreneurship. The results of the analysis also showed that all variables had a direct influence on social entrepreneurship, except for the organizational environment variables. Second, based on the results of the analysis, all variables did not have an indirect influence on social entrepreneurship. Third, based on the second model of social entrepreneurship, the analysis revealed that organizational environment variables, social environment, economic environment, individual characteristic, education and training, experience, and family demands indirectly influenced the social entrepreneurship with entrepreneurship as the intervening variable, except the economic environment variable.

Future researches can be developed by adding models of industrial factors other than agricultural and educational factors. The role of government in this study has also not been analyzed in the model, although theoretically it is alluded to. The government plays a role in correcting through various policies and institutions. Future researches can also develop models, which add governmental factors. It can be done by comparing government policies in the agricultural, industrial, and education sectors or by using secondary data in a longer period.

References

Abdulmelike, A. 2017. Social Entrepreneurship: Literature Review and Current Practice in Ethiopia. *European Journal of Business and Management*, *9*(31), 86-93. Retrieved from https://www.iiste.org/Journals/index.php/EJBM/article/view/39601/40719

Alvord, S. H.; Brown, D. L.; & Letts, C. W. 2004. Social Entrepreneurship and Societal Transformation: An Exploratory Study. *Journal of Applied Behavioural Science*, *40*(3), 260-282. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.321.8660&rep=rep1&type=pdf

Bornstein, D. 2004. *How to Change the world: Social Entrepreneurship and the power of new ideas*. New York: Oxford University Press.

Buchko, T. 2018. Social Entrepreneurship and Its Implications for Hungary. *Periodica Polytechnica Social and Management Sciences*, *26*(1), 36-48. Retrieved from https://doi.org/10.3846/bme.2018.2198

Dahama, O. P.; & Bhatnagar, O. P. 1980. *Training principles and practices: Education and Communication for Development*. New Delhi: Oxford and IBH Publishing Company Pvt Ltd.

Daud, N. S.; Ishak, S. I. D.; Abdullah, S.; Azmi, A. A.; Ishak, A. S.; & Ahmad, A. 2018. The Discussion of Social Entrepreneurship: Review of the Literature. *MATEC Web of Conferences*, 150, 1-8. Retrieved from https://www.matecconferences.org/articles/matecconf/pdf/2018/09/matecconf_mucet2018_05095.pdf

Drucker, P. F. 1996. *Inovasi dan Kewiraswastaan: Praktek dan dasar-dasar*. Jakarta: Erlangga.

European Commision. 2018. *Peer Review on Social Entrepreneurship to tackle unmet social challenges*. Oslo: Directorate-General for Employment, Social Affairs and Inclusion. Retrieved from https://ec.europa.eu/social/BlobServlet?docId=19230&langId=en

Epstein, M. J.; & Crane, C. A. 2007. *Alleviating global poverty through microfinance: Factors and measures of financial, economic, and social performance*. San Francisco: Jossey-Bass.

Estrin, S.; Mickiewicz, T.; & Stephan, U. 2013. Entrepreneurship, Social Capital, and Institutions: Social and Commercial Entrepreneurship across Nations. *Journal of Entrepreneurship Theory and Practice*, *37*(3), 479-503. Retrieved from https://sci-hub.tw/https://onlinelibrary.wiley.com/doi/abs/10.1111/etap.12019

Ghandi, T.; & Raina, R. 2018. Social entrepreneurship: the need, relevance, facets and constraints. *Journal of Global Entrepreneurship Research*, *8*(9), 1-13. Retrieved from https://cpr.bu.edu/app/uploads/2018/07/Social_entrepreneurship_the_n.pdf

Ghozali, I. 2014. *Structural Equation Modeling: Metode Alternatif dengan Partial Least Square (PLS)*. Semarang: Badan Penerbit Universitas Diponegoro.

Greenhaus, J.; & Singh, R. 2003. *Work-Family Linkages, A Sloan Work and Family Encyclopedia Entry*. Chestnut Hill: Boston College.

Harrington, D. 2009. *Confirmatory Factor Analysis*. New York: Oxford University Press, Inc.

Hibbert, S. A.; Hogg, G.; & Quinn, T. 2002. Consumer response to social entrepreneurship: the case of the Big Issue in Scotland. *International Journal of Nonprofit & Voluntary Sector Marketing*, *7*(3), 288-301. Retrieved from https://sci-hub.tw/https://onlinelibrary.wiley.com/doi/abs/10.1002/nvsm.186

Hisrich, R. D.; & Peters, M. P. 1992. *Entrepreneurship, Starting, Developing, and Managing a New Enterprise* (2nd ed.). New York: Irwin Publishing Ltd.

Kadarsih, R.; Susilaningsih; & Sumaryati, S. 2013. Faktor – faktor yang mempengaruhi minat berwirausaha pada Mahasiswa Program Studi Pendidikan Ekonomi FKIP UNS. *Jurnal Pendidikan UNS*, *2*(1), 95-106. Retrieved from http://jurnal.fkip.uns.ac.id/index.php/ekonomi/article/view/2708

Kimmit, J.; & Muñoz, J. 2018. Sensemaking the 'social' in social entrepreneurship. *International Small Business Journal: Researching Entrepreneurship*, *36*(8), 859-886. Retrieved from https://doi.org/10.1177/0266242618789230

Kirzner, I. M. 1973. *Competition and Entrepreneurship*. Chicago: University of Chicago Press.

Mair, J.; & Noboa, E. 2003. The Emergence of Social Enterprises and Their Place in the New Organizational Landscape. *IESE Working Paper 253 Barcelona*. Retrieved from https://core.ac.uk/download/pdf/6536275.pdf

Mazzarol, T.; Volery, T.; Doss, N.; & Thein, V. 1999. Factors Influencing Small Business Start-Ups: A comparison with previous research. *International Journal of Entreprenurial Behaviour & Research*, *5*(2), 48-63. Retrieved from https://pdfs.semanticscholar.org/6699/5f7cc5df18730f9cd6e55973201154599a65.pdf

McMullen, J. S. 2011. Delineating the domain of development entrepreneurship: A market based approach to facilitating inclusive economic growth. *Entrepreneurship Theory and Practice*, *35*(1), 185–193. Retrieved from https://www.effectuation.org/wp-content/uploads/2017/06/McMullen-2011-Entrepreneurship_Theory_and_Practice.pdf

Meredith, G. G.; Nelson, R. E.; & Neck, P. A. 1996. *Kewirausahaan, Teori dan Praktek*. Jakarta: PT Pustaka Binaman Pressindo.

Myres, K.; Mamabolo, A.; Mugudza, N.; & Jankelowitz, L. 2018. *Social Enterprises in South Africa: Discovering a vibrant sector*. Pretoria: Gordon Institute of Business Sciences. Retrieved from https://www.gibs.co.za/programmes/the-centre-for-leadership-anddialogue/Documents/18103%20Stakeholder%20Report_FINAL.pdf

Mohapatra, S.; Khadanga, G. S.; & Majhi, S. 2018. Social entrepreneurship for agricultural development in India. *The Pharma Innovation Journal*, *7*(4), 204-205. Retrieved from http://www.thepharmajournal.com/archives/2018/vol7issue4/PartD/7-3-73-624.pdf

Mort, G. S.; Weerawardena, J.; & Carnieige, K. 2003. Social entrepreneurship: Towards conceptualisation. *International Journal of Nonprofit and Voluntary Sector Marketing*, *8*(1), 76-88. Retrieved from https://sci-hub.tw/https://onlinelibrary.wiley.com/doi/abs/10.1002/nvsm.202

Mustofa, Y. 1996. *Teknik Wiraswasta Dalam Keluarga*. Jakarta: Rineka Cipta.

Nicholls, A. 2006. *Social Entrepreneurship: New Models of Sustainable Social Change*. USA: Oxford University Press.

Prabhu, G. N. 1999. Social Entrepreneurial Leadership. *Career Development International*, *4*(3), 140-145. Retrieved from http://dx.doi.org/10.1108/13620439910262796

Peredo, A. M.; & McLean, M. 2006. Social entrepreneurship: a critical review of the concept. *Journal of World Business*, *41*(1), 56–65. Retrieved from http://www.sciencedirect.com/science/article/pii/S1090951605000751

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2019 Volume 7 Number 1 (September)
http://doi.org/10.9770/jesi.2019.7.1(18)

Priyanto, S. H. 2004. Pengaruh Lingkungan eksternal, kewirausahaan dan kapasitas manajemen terhadap kinerja usaha tani: Studi empiris pada petani tembakau di Jawa Tengah. *Dissertation*. Program Studi Ilmu Ekonomi Pasca Sarjana Universitas Brawijaya.

Prodanov, H. 2018. Social Enterpreneurship and Digital Technologies. *Economic Alternatives*, 1, 123-138. Retrieved from https://www.unwe.bg/uploads/Alternatives/9_Prodanov_EAlternativi_en_1_2018.pdf

Riyanti, B. P. D. 2003. *Kewirausahaan dari sudut pandang psikologi kepribadian*. Jakarta: Grasindo.

Repetti, R. L.; Taylor, S. E.; & Seeman, T. E. 2002. Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin*, *128*(2), 330-366. Retrieved from http://dx.doi.org/10.1037/0033-2909.128.2.330

Sadoulet, E.; & de Janvry, A. 1995. *Quantitative Development Policy Analisys*. Baltimore: The Johns Hopkins University Press.

Sannikova, A.; & Brante, I. 2018. Development of Social Entrepreneurship in Latvia. *Business, Management and Education*, *16*(1), 147-159. Retrieved from https://doi.org/10.3846/bme.2018.2198

Santoso, S. 2012. *Analisis SEM Menggunakan AMOS*. Jakarta: Elex Media Komputindo.

Siagian, S.; & Asfahani. 1995. *Kewirausahaan Indonesia dengan Semangat*. Jakarta: Kloang Klede Jaya Putra Timur.

Sharir, M; Lerner, M. (2006). Gauging the success of social ventures initiated by individual social entrepreneurs. *Journal of World Business*, *41*(1), 6-20. Retrieved from http://www.sciencedirect.com/science/article/pii/S1090951605000568

Shin, C. 2018. How Social Entrepreneurs Affect Performance of Social Enterprises in Korea: The Mediating Effect of Innovativeness. *Sustainability*, *10*(8), 1-14. Retrieved from https://www.mdpi.com/2071-1050/10/8/2643

Thompson, J.; Alvy, G.; & Lees, A. 2000. Social Entrepreneurship - A New Look At the People and the Potential. *Management Decision*, *38*(5), 328-338. Retrieved from http://dx.doi.org/10.1108/00251740010340517

Umar, T. R.; Mat, N. K. N.; Tahir, F. A.; & Alekam, J. M. 2012.The Practicality andApplication of Aaker's CustomerBased Brand Equity Model in the Nigerian Banking Sector. *American Journal of Economics*, *Special Issue*(June), 149-152. Retrieved from http://article.sapub.org/pdf/10.5923.j.economics.20120001.33.pdf

Soemanto, W. 2002. *Pendidikan Wiraswasta*. Jakarta: Bumi Aksara.

Wijayanto, S. 2008. *Structural Equation Modelling dengan LISREL 8.8: Konsep dan Tutorial*. Yogyakarta: Graha Ilmu.

Wijono, S. 2005. Pengaruh Kepribadian Tipe A, Locus of Control External, Peran dan Iklim Organisasi Terhadap Stress dan Prestasi Kerja dengan Prestasi Kerja. *Dissertation*. Universitas Indonesia.

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GREEN ENTREPRENEURIAL ORIENTATION AND FIRM PERFORMANCE IN SOUTH AFRICA*

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Abstract. The aim of the study was to investigate the impact of green entrepreneurial orientation (GEO) on the sustainable performance (SP) of firms in the context of the hospitality sector. Sustainable performance was measured by financial, environmental and social indicators. The study utilised the quantitative research approach and the causal research design. The cross-sectional survey method was used for data collection. Questionnaire was distributed to 500 owner/managers of formal hotels and guest accommodations in South Africa. 192 respondents participated in the survey. Descriptive statistics and the structural equation modelling were used for data analysis. The Cronbach's alpha was used as the measure of reliability. The results indicated a significant positive relationship between GEO and financial, environmental and social performance. The findings of the study can assist firms in the hospitality sector understand firm-level factors that can impact on sustainability initiatives.

Keywords: green entrepreneurial orientation; financial; environmental; social; sustainable performance; South Africa

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1. Introduction

The broad tourism industry including the hospitality sector contributes significantly to employment creation and economic growth worldwide. Including indirect economic contribution, the tourism industry accounts for approximately 10% of global gross domestic product (GDP) and one out of eleven jobs worldwide (World Travel & Tourism Council, 2015). In the European Union, tourism is the third largest socio-economic activity. The hospitality sector employs about 80% of the total European Union tourism workforce (Hotrec Hospitality Europe,

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2018). In South Africa, the tourism industry including the hospitality sector is a vital part of the economy and is one of the main drivers of sustained and inclusive growth. The tourism sector accounted for 2.9% of South Africa's gross domestic product in 2016. The tourism industry employs 4.4% or one out of every twenty three of the South African workforce. In addition, the tourism industry created 40,000 net new jobs between 2012 and 2016 (Statistics South Africa, 2018).

Although tourism and hospitality can benefit the environment though conservation and preservation of nature, their activities also have the potential to destroy the natural environment in the communities in which they operate. The hospitality sectors puts pressure on natural resources through high food, water, energy and raw material consumption. The other negative environmental impacts of tourism includes pollution through air emissions, sewage and noise. The physical impact of the hospitality sector on the environment include construction activities, infrastructure development, deforestation and unsustainable use of land (Kolawole et al. 2016; Pramanik and Ingkadijaya, 2018). There is a growing consensus by governments, businesses and academics that the current established economic system that focuses primarily on profit maximisation is unsustainable. Greater attention needs to be focused on environmental issues and how to reduce or eliminate environmental degradation caused by business activities (DiVito and Bohnsack 2017; Jiang et al. 2018). For instance, the contribution of South Africa to global emissions is about 1.2% and the country as a signatory to the Kyoto Protocol on Climate change, has promised to reduce emissions by 34% by 2020 and 42% by 2025 (Vosper and Mercure, 2016).

The Brundtland Report (1987), entitled "Our common future" highlights the importance of sustainable development in the perspective of economic growth, social justice and environmental safety. New business models are required to take into consideration the impact of business activities on the environment. With the negative effects of climate change becoming increasingly apparent, there is the need for a sustainable shift in the current production and consumption systems. The change into a green or sustainable economy needs to be led by entrepreneurs who can introduce innovative business solutions that will cater to environmental and social challenges of the twenty-first century. Businesses have the long-term goal, technological knowledge and financial resources to provide solutions to environmental problems. Environmental challenges actually present opportunities to businesses (Casey and Sieber, 2016; Haldar, 2018). The factors that can affect a firm's sustainability initiatives are external and internal. External factors include government regulations and customers. A firm's internal structure and resources can also affect the level of aspiration for environmental sustainability. Sustainability-oriented businesses depend upon the institutionalisation of the environmental processes into their systems (Küçükoğlu and Pınar, 2015; Merriman et al. 2016). Entrepreneurial orientation (EO) is an important intangible resource that characterises a firm-level strategic organisational orientation. EO depicts a firm's strategy, managerial behaviour and values that are entrepreneurial in nature. EO helps a firm to discover and exploit opportunities and focuses on innovativeness, proactiveness and the tendency to take risk. Thus, EO can help a firm through its internal processes, structure and behaviour to identify and pursue sustainability initiatives (Rauch et al. 2009; Dickel 2018).

Green entrepreneurial orientation (GEO) can be described as a firm's inclination to focus on opportunities that produce both financial and environmental benefits through the introduction of environmentally-friendly products and services. GEO involves green innovations and a proactiveness to capture green opportunities and risk-taking behaviour (Gibbs and O'Neill, 2014; Pratono et al. 2018). One of the ways to examine the impact of a firm sustainability initiatives such as GEO is to measure their effect on performance. This study used the sustainable or triple bottom-line approach to measure performance. Sustainable performance takes into consideration not just economic profit but also social and environmental performance. The aim of the study is to investigate the effect of GEO on sustainable performance of firms in the hospitality sector. The study makes a contribution to sustainability and tourism research in the following ways. First, green entrepreneurship is an increasingly significant phenomenon from a sustainable development perspective, but still largely under-researched by

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scholars especially in the context of the hospitality industry. Second, although, the positive relationship between EO and performance is largely supported in the context of traditional profit maximising ventures, the nexus between EO and performance is uncertain in the context of green entrepreneurship (Lumpkin et al. 2013). In addition, the impact of GEO on firm performance remains unclear. Whilst some studies find a significant positive relationship between green entrepreneurship and financial and environmental performance, other studies find an insignificant or a negative relationship (Gibbs and O'Neill, 2014; Shrivastava and Tamvada, 2017; Amankwoh-Amoah, et al. 2018; Jiang et al. 2018). These gaps in extant literature stimulated the study. The findings of this study can help firms in the hospitality sector to understand firm-level factors that can impact on sustainability initiatives. The study is organised in the following way: The literature on the hospitality sector, sustainability and GEO is reviewed and hypotheses developed in the next section. This is followed by the research methodology, results, discussion and conclusion.

2. Literature review

2.1 The hospitality sector and sustainability

Although hospitality is one of the oldest professions and contributes significantly to job creation and economic growth, there is no consensus on its definition. The failure to adequately define hospitality has led to a disjointed academic environment (Hemmington 2007, Ottenbacher et al. 2009). Hospitality is often defined within the context of the broad tourism industry. The United Nations World Tourism Organisation (2018) defines tourism as "*a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditu*re". Tourism related activities include accommodation, food and beverage services, recreation and entertainment, transportation and travel services. The hospitality industry is the combination of the accommodation and food and beverage groupings and collectively make up the largest segment of the tourism industry (United Nations World Tourism Organisation, 2008a). According to Hemmington (2007), hospitality can be defined within the perspective of behaviour and experience. There are five key dimensions of hospitality as a commercial experience. These are the host-guest relationship, generosity, theatre and performance, lots of little surprises and safety and security. The Department of Labour of South Africa (2016) describes the hospitality sector as a commercial business involved in the provision of accommodation. The hospitality sector includes hotels, motels, lodges, guest houses including bed and breakfast establishments, restaurants, pubs, taverns and cafés. The hospitality sector is part of the broad tourism industry contributed 9.6% of total employment, 8.2% of total investment and 8.9% of South Africa's GDP in 2017. Despite the positive contribution of the hospitality sector, the negative impacts of the sector include the production and emissions of greenhouse gases, high water and energy consumption Mbasera et al. 2016; Idahosa et al. 2017). The negative impacts of hospitality has led to the demand by government, customers, business and academics for green or sustainable hospitality. Green hospitality is a normal fit for entrepreneurs that wish to pursue business opportunities in the dynamic business environment where sustainability has become an important part of the business model (Deale, 2013; Melissen, 2013).

The Brundtland Report of 1987 defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable tourism (hospitality) can be defined as "*hospitality that takes full account of the current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities*." (Deale, 2013, p1). Sustainable hospitality should make optimal use of resources, respect the socio-cultural identity of host communities and provide social and economic benefits to all stakeholders (United Nations World Tourism Organisation 2018b). Sustainable hospitality creates employment and economic growth while enhancing and protecting social, natural and cultural resources for the well-being of both residents and visitors. Future tourism and hospitality experiences will be more oriented towards eco-friendly destinations and businesses (van Rheede

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and Blomme, 2012; Fermani et al. 2016). The factors that can affect a firm's sustainability initiatives can be external or internal. External factors include government regulations and customers. A firm's internal structure and resources can also affect the level of aspiration for environmental sustainability. EO is an important intangible resource at firm-level (Küçükoğlu and Pınar, 2015; Merriman *et al*., 2016).

2.2 Green entrepreneurial orientation

The term entrepreneurial orientation (EO) does not have a universally accepted definition. Many terminologies are often used by researchers to denote EO. These include intrapreneurship, corporate entrepreneurship, corporate venturing, intrapreneuring and internal entrepreneurship (Wales et al. 2013). EO is a firm decision-making proclivity favouring entrepreneurial activities. EO is the process through which an organisation pursues innovative entrepreneurial opportunities without inhibition by the nature and level of currently available resources. The set of firm behaviour that reflect EO include autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness (Covin and Lumpkin, 2011; Dickel, 2018). According to Miller (1983, p771), EO describes a firm is "*that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with proactive innovations, beating competitors to the punch*"

Originally, entrepreneurship and the natural environment were thought to be incompatible by economists, however, management researchers lately have found out that the two concepts can play an important role in modern economic development. Businesses are responsible for many environmental challenges (pollution and high material, water and energy consumption). These challenges can actually present opportunities for new and established entrepreneurial ventures (Dean and McMullen, 2007; Nikolaou et al. 2018). This has led to the development of green entrepreneurship, a business model that takes into consideration profit and environmental protection (Kirkwood and Walton, 2010). Various terms with slightly different meanings have been associated with green entrepreneurship. These include ecopreneurship, environmental entrepreneurship, sustainable entrepreneurship or triple-bottom-line-oriented entrepreneurship (Spence et al. 2011). A green business can be defined as "*a firm or business set up with the motive of contributing to a sustainable society either by adapting innovative processes and producing products which do not have a negative impact on the environment or firms which have adapted innovative processes and/or products over time, which reduce their impact on the environment* (Haldar, 2018, p235). Green entrepreneurship is the inclination of a firm to focus on opportunities that produce financial and environmental benefits through the use of green activities. Green entrepreneurial orientation (GEO), a concept that came from EO, is a combination of entrepreneurial orientation and green entrepreneurship. GEO is reflected in green innovativeness, proactiveness and risk-taking of a firm. GEO allows the identification of business opportunities, while considering environmental aspects (Ge et al. 2016; Jiang et al. 2018).

The Stakeholder theory and the The Natural-Resource Based View (NRBV), an extension of the Resource Based View (RBV) of the firm can be used to provide the theoretical justification for the relationship between GEO and firm performance. The Stakeholder Theory by Freeman (1984) defines stakeholders as an organisation or individual whose activities are either affected by the firm or affects the way the firm operates. Stakeholders include employees, investors, and customers, suppliers and the environment. RBV by Barney (1986, 1991) contends that valuable firm resources and capabilities are the key sources of sustainable competitive advantage for a firm. GEO is an important firm-level strategic organisational orientation that takes into consideration the environment. The NRBV by Hart (1995) posits that the competitive advantage of a firm is based on its relationship with the natural environment.

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2.3 Sustainable performance

Performance can be defined as the results of activities of an organisation or investment over a given period. Performance measures provide the yardstick to evaluate a firm's strategies and its level of commitment to achieve established standard criteria, either as a metric or as an initiative. Performance measures include financial and non-financial indicators. Financial measures are quantifiable and objective and include the gross profit, net profit, return on assets and return on equity. Non-financial measures are subjective and include employee and customer satisfaction (Ahmad and Sabri, 2016; Mjongwana and Kamala, 2018). There is a paradigm shift in recent years to measure performance through sustainable indicators. Sustainability performance can be defined as the performance of a firm in all dimensions and for all drivers of corporate sustainability. One of the ways to measure sustainable performance is the triple bottom line (TBL) approach which adds both environmental and social dimensions to the traditional financial results (Elkington, 1998; Qorri et al., 2018). Financial sustainability relates to a positive financial performance especially in the areas of sales and profit. Social sustainability focuses on performance with respect to the community where the business operates and its relationship with customers and employees. Environmental sustainability refers to a firm's performance with respect to its environmental responsibilities (Yang et al. 2011; Nappi and Rozenfeld, 2015).

2.4 GEO and financial performance

The literature is not conclusive about the relationship between GEO and financial performance. The findings of the study by Jiang et al. (2018) support a significant positive relationship between GEO and financial performance. GEO improves firm financial performance through innovation that reduces the consumption of materials, energy and water and process efficiency. GEO also allows a firm to comply with regulations and avoid paying penalties. This has the advantage of cost reduction. Customer attitude and preference are shifting toward green purchasing and consumption. GEO allows a firm to be proactive and gain first-mover competitive advantage. According to Demirel et al. (2019), green entrepreneurship enhances firm performance through increased transparency, cost-efficiency, better risk management and revenue growth as a result of product differentiation. Hernandez-Perlines and Cisneros (2018) find that sustainable entrepreneurial orientation has a significant positive relationship with financial performance of exporting family firms. However, the findings of Parish (2010) and Nikolaou et al. (2011) reveal that green entrepreneurship is not appropriately associated with financial incentives. The real incentives for green entrepreneurship is not the financial benefits but sustainability values, which cannot be easily recognised in the conventional views of a business. The additional costs associated with green entrepreneurship put entrepreneurs at a competitive disadvantage and this limits the economic impact. In addition, many new green entrepreneurs are financially constrained and do not have adequate resources. This negatively impacts on profitability (Pacheco et al. 2010; Ning et al. 2015). Shrivastava and Tamvada (2017) find a negative relationship between the offering of green products and services and financial performance. Sustainability issues, such as green awareness, does not directly affect firm financial performance (Soto-Acosta et al. 2016). However, firms with a strong GEO are innovative and proactive and take risk in order gain competitive advantage in the marketplace. The competitive advantage can improve sales and market share and translate into better financial performance. It is hypothesised that there is a significant positive relationship between GEO and financial performance.

2.5 GEO and environmental performance

Dickel (2018) points out in contrast to the largely supported positive relationship between EO and firm performance, the impact of EO on environmental performance is less evident. Environmental performance is indicated by the reduction of material and energy consumption and waste and compliance with environmental regulations. Entrepreneurial firms are more likely see environmental performance indicators as business

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opportunities. Sustainable entrepreneurs create and change business models in order to positively influence ecological and social impact. EO provides reflexivity which is the ability of the entrepreneur to evaluate environmental constraints and visualise or construct alternative opportunities. EO allows a sustainable entrepreneur to create and evaluate unclear decision alternatives between entrepreneurial opportunities and sustainability values (DiVito and Bohnsack, 2017). Ge et al. (2016) find that green proactiveness has a significant positive impact on green performance through reduction in pollution, waste and energy consumption. Jiang et al (2018) find a significant positive relationship between GEO and environmental performance. GEO can contribute to better environmental performance by creating green products and services, reducing waste and material, energy and water consumption and ensuring employee and customer safety. It is hypothesised that there a significant positive relationship between GEO and environmental performance.

2.6 GEO and social performance

The traditional view of the relationship between sustainability and social responsibility suggests that green initiatives are associated with costs that are unlikely to be recovered. The modern view of the relationship is that can EO can enhance relationships with stakeholders ((Lumpkin and Dess, 1996). Thus EO can lead help a firm to improve customer satisfaction and employee safety. EO will result in the potential of a firm to become greener and more socially responsible (Mullens, 2018) Henandez-Perlines and Cisneros (2017) find that EO positively moderates the relationship between social responsibility and firm performance. Low and Thurasa (2016) point out that the five dimensions of EO are related to internal corporate social responsibility and can enhance green entrepreneurship. Autonomy gives employees the independence and authority to make green decisions. This improves employee morale. Competitive aggressiveness helps a firm to attract green-oriented employees when in competition with other firms. Proactivess helps a firm to be forward looking in its relationship with employees and external stakeholders such as the environment. The innovativeness dimension of EO has a positive relationship with corporate social responsibility (Hong and Cho, 2012). Many customers want to be associated with firms that have created green businesses and products, and services. Environmentally friendly consumption attitudes include selecting and purchasing environmentally friendly products and avoidance of non–environmentally friendly products (Arabatzis et al. 2015). Eco-friendly green revolution has penetrated the workplace and is changing the way that firm attract and retain talent. It is hypothesised that there is a significant positive relationship between GEO and social performance.

3. Research methodology

The study utilised the quantitative research method. The causal research design was utilised to test the relationship between the variables of the study. The cross-sectional survey method was used for data collection. The questionnaire developed for the study was self-administered by the researcher to the respondents. The population for the study is all hotels in South Africa. The study used the convenience sampling method because the hotels were selected from a variety of accommodation databases. The following databases were used to identify the sample of the study: Johannesburg Accommodation listing, Tshwane Accommodation listing, Centurion Bed and Breakfast Association, Guesthouse Association of Tshwane and the Tourism Grading Association of South Africa. The study focused on formal service accommodations (hotels and lodges) and guest accommodation (Bed and Breakfasts, Country houses and Guest houses) **(**Tourism Grading Association of South Africa, 2018). The researcher physically distributed 500 questionnaires through visits to the respondents. Managers or owners were the identified respondents because they were more likely to have the required information about the GEO and sustainability performance of their organisations. The researcher obtained the phone numbers and email addresses during the distribution of questionnaires. Reminders were sent to the respondents every week through emails and phone calls to complete the questionnaire. However, if questionnaires were not received after one week, follow-up procedure included telephone calls and email reminders every week. If no response is received after six week, it is treated as non-response. This resulted in the collection of 192 completed and usable questionnaires which the

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researcher believed was adequate for data analysis and inferences. The questionnaire was pre-tested in a pilot study of thirty respondents to improve face and content validity before actual data collection. The researcher informed the participants about the aim of the study and that participation was voluntary. The participants were also assured confidentiality and anonymity, thus the names of the participants and their organisations were not included in the questionnaire. The Cronbach's alpha was used as the measure of reliability. The minimum recommended coefficient is 0.70 (Nunnally, 1978). Descriptive statistics and structural equation modelling (SEM) were used for data analysis. This study used the Partial Least Squares (PLS) path modelling which is a variance based approach to test the research model. PLS-SEM is a causal-predictive method of analysis. Compared to the covariance–based SEM, PLS does not impose many rigid assumptions on population, distribution or scale measurement. PLS is more robust with less restrictions placed on the unbiased estimate of the sample size and has the capability to handle statistical analysis for formative and reflective indicators (Haenlein and Kaplan, 2004; Hair et al. 2014). Smart PLS 3.2.7 was the software package used for data analysis. The PLS SEM consists of two sub-models which are the measurement model and the structural model (Chin et al.2010). This study used the two-step analysis by examining first the measurement model and then the structural model.

3.1 Measures

Environmental performance (EP) was measured using a five-item scale (1) (improved efficiency of raw materials, (2) reduced resource consumption (energy and water), (3) increased recycling of materials, (4) reduction in the cost of environmental compliance and (5) increased overall reputation in respects of products and services (during the last three years). The items were adapted from previous studies (Qorri et al. 2018; Magsi et al. 2018). All the question items to measure EP were anchored on the five-point Likert scale with "1 strongly disagree and 5 strongly agree". The last three years is broad enough to take into consideration seasonal and cyclical fluctuations in business practices and performance (Urban and George, 2018).

Financial performance (FP): Three question items were used to FP. These were (1) increase in sales, (2) increase in market share and (3) increase in profit during the last three years. All the question items to measure FP were anchored on five-point Likert scale with "1 strongly disagree and 5 strongly agree". This is consistent with previous studies on financial performance (Maletic et al. 2016; Qorri et al. 2018). The study used the subjective measures because objective measures of the performance of the respondents which were mainly small and medium enterprises were not available. The use of subjective measures of performance is consistent with other empirical studies (Urban and George, 2018).

Social performance (SP) was measured by five question items. (1) increased customer satisfaction with products and services, (2) reduced staff turnover, (3) increased employee satisfaction (4) increased health and safety performance and (5) increased contribution for social issues. All the question items were anchored on five-point the Likert scale with "1 strongly disagree and 5 strongly agree". This is consistent with previous studies on SP (Hong and Cho, 2012; Henandez-Perlines and Cisneros, 2017).

GEO: Eight question items were used to measure GEO. These are (1) my firm has introduced many new green products and services (2) changes in our green products or service lines have been quite dramatic (3) In general, my firm favour a strong emphasis on green practices such as research and development, technological leadership and innovations (4) In general, my firm has the tendency to be ahead of others in introducing green products or services (5) In dealing with competition, my firm often try to initiate green actions for which competitors respond (6) We believe that owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's green objectives (7) My firm typically adopts bold aggressive posture to maximize the probability of exploring potential green opportunities (8) My firm has a strong preference for high risk green projects with chances of high return (Lumpkin and Dess,1986; Covin and Wales, 2012). All the question items were anchored on the five-point Likert scale with "1 strongly disagree and 5 strongly agree".

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4. Results

4.1 *Response rate and biographical information*

500 questionnaires were distributed to owners and managers of hospitality firms. 204 questionnaires were returned. 192 questionnaires were found usable and 12 questionnaires were deemed unusable as the respondents did not complete certain vital parts of the questionnaire. The response rate was 38.4%. Independent samples T-test and Anova were used to test for statistically significant differences in the responses on the basis of demographic information. The results were not statistically significant. Table 1 shows the biographical details of the respondents.

Table 1. Biographical details of the respondents

Biographical Characteristics	Frequency (*N* = 192)
Educational qualification of respondents	
Below Matric	0
Matric	45
Post–Matric qualifications	147
Gender of the respondents	
Female	72
Male	120
Age of the respondents (years)	
Less than 20	0
20–30	7
31–40	59
41–50	73
Above 50	53
Age of the firm (years)	
Less than one	0
1–5	36
6–10	104
Above ten years	52
Number of employees	
No employees	0
1–5 employees	0
6-20 employees	33
21–50 employees	89
51–200 employees	70

Source: author

Table 1 shows that the majority of the respondents are male with post Matric qualification, with six to ten years of operation, and between 21 and 50 employees. Therefore, the majority of the responding firms can be classified as small and medium enterprises according to the schedule of size standards for the classification of businesses in South Africa (Government Gazette, 2003).

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4.2 Descriptive statistics

Table 2. The descriptive statistics of GEO and sustainable performance.

Construct	Mean	Standard deviation
GEO	3.170	1.011
FP	3,250	1.075
EP	3.355	1.092
SP	3.190	1.007

Source: author

Table 2 depicts the descriptive statistics of GEO and SP. The mean for GEO is 3.170 with a standard deviation of 1.011. Out of the three measures of SP, EP has the highest mean with 3. 355 and a standard deviation of 1.092. This is followed by FP with a mean of 3.250 and a standard deviation of 3.250 and a standard deviation of 1.075 and then SP with a mean of 3.190 and standard deviation of 1.007.

4.3 *Measurement model assessment*

The study assessed the convergent and the discriminant validity of the measurement model. Hair et al. (2014) point out that to assess the measurement model, it is important to determine individual item reliability, internal consistency, content, convergent and discriminant validity. Factor loading, composite reliability and average variance extracted (AVE) were assessed in order to determine convergent validity. The factor loading cut-off for the study was 0.7 (Hair et al. 2010). Two GEO items (items 2 and 3) had outer loadings lower than 0.7 and were deleted. Internal consistency reliability is expected to be 0.7 and above (Hair et al. 2014). The reliability of constructs was measured using the Cronbach's alpha. Table 3 shows that all the four Cronbach's alpha coefficients were greater than 0.70, indicating adequate reliability (Nunnaly, 1978). Scale reliability was further assessed by the composite reliability. When SEM-PLS is used, it is suggested that the composite reliability values rather than the Cronbach's alpha coefficients be used. The minimum of 0.70 is suggested for composite reliability (Hair et al. 2014). The composite reliability values for the study were greater than 0.8 for all the constructs, suggesting adequate reliability for the study. Convergent validity was further assessed by the average variance extracted (AVE). Hair et al. (2014) recommend a minimum of 0.50 as the AVE. The AVEs of all the latent variables were greater than 0.5 suggesting adequate convergent validity. Discriminant validity testing of the reflective scale measurement was performed after convergent validity. In order to confirm discriminant validity, the square root of AVE for each latent construct should be higher than the correlations of any other latent construct (Chin et al. 2014). Table 4 shows that the square root of AVE is higher than the correlations among the latent variables ensuring adequate discriminant validity for the constructs in this study.

Overall the measurement model exhibited adequate convergent and discriminant validity (see Table 3 and Table 4 respectively).

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Table 3. Convergent validity

Constructs	item	Loading	Cronbach's alpha	Composite reliability	AVE
GEO	1	0.826	0.812	0.907	0.621
	4	0.763			
	5	0.844			
	6	0.827			
	7	0.718			
	8	0.741			
FP	1	0.791	0.799	0.913	0.780
	2	0.992			
	3	0.855			
EP	1	0.829	0.824	0.901	0.648
	2	0.763			
	3	0.788			
	4	0.826			
	5	0.813			
SP	1	0.806	0.816	0.888	0.614
	2	0.764			
	3	0.816			
	4	0.729			
	5	0.799			

Table 4. Discriminant validity

Construct	1	2	3	4
GEO	*0.788*			
FP	0.892	*0.883*		
EP	0.787	0.714	*0.804*	
SP	0. 728	0.688	0.719	*0.784*

The square root of the average variance extracted (AVE) are represented by diagonals in italics. Other entries represent the correlations. FP = financial performance, EP = environmental performance, SP = social performance, GEO = green entrepreneurial orientation. *Source*: author

4.4 Structural model assessment

Table 5. Structural model assessment

Hypotheses	Direction	Standard Beta/Path coefficient	Standard error of estimate	t-value	Decision
H1	GEO to FP	0.25	0.07	3.68***	Accepted
H2	GEO to EP	0.29	0.09	3.94***	Accepted
H3	GEO to SP	0.23	0.05	3.56***	Accepted

***p < 0.01 *Source*: author

Table 5 depicts the summary of the structural model which shows the causal relationship between the constructs of the model. The structural model is assessed based on the estimation of the path coefficients and the predictive power based on the value of the $R^{2.}$ (Sang et al. 2010). The R^2 shows the proportion of variation in the dependent variable that is explained by one or more predictor variables. R^2 value of 0.19 is considered weak, 0.33 moderate and 0.80 substantial in the context of PLS-SEM (Chin, 1998). The R^2 values obtained in this study are moderate. The results (β0.25, $p < 0.01$) support a significant positive relationships between GEO and FP. The results (β 0.29,

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$p < 0.01$) support a significant positive relationships between GEO and EP. The results (β 0.23, $p < 0.01$) support a significant positive relationships between GEO and SP. The conclusion of the results of the study is that GEO positively influences the sustainable performance of firms in the hospital industry.

4.5 Common method bias and predictive relevance of the model

The variance inflation factors (VIFs) was used to evaluate both vertical and lateral collinearity. VIF with a value greater than 3.3, suggests that the model may be contaminated by Common method bias (CMB) (Kock, 2015). The VIFs for all the constructs used in this study were below 3.3 suggesting that the model is free of CMD. The predictive relevance of the model is a recommended supplementary assessment. This study used the cross-validated redundancy measure Q^2 for assessing the predictive model. It can be assumed that the model has predictive relevance, if the Q^2 value is greater than zero, (Dijkstra and Henseler, 2015). The Q^2 of this model is greater than zero suggesting the predictive relevance of the model.

5. Discussion

The study investigated the relationship between GEO and sustainable performance of firms in the hospitality sector. Financial, environmental and social indicators were used to measure sustainable performance. Despite the importance of GEO, studies on GEO and sustainable performance are sparse. In addition, the relationship between GEO and sustainable performance is unclear (Jiang et al. 2018). The study hypothesised that there is a significant positive relationship between GEO and FP, EP and SP. The findings of the study which is validated by a data set of 192 firms in the hospitality sector and analysed through PLS-SEM show significant positive relationship between GEO and FP. The results indicate that GEO can help to improve the financial performance of firms. This is consistent with the findings of Hernandez-Perlines and Cisneros (2018) and Jiang et al. (2018) that GEO has a positive influence on financial performance. GEO improves financial performance through innovativeness and proactiveness that help firms to reduce the consumption of materials and improve process efficiency. This leads to a reduction in operational costs. In addition, GEO enhances compliance with environmental regulations and eliminates potential fines and penalties associated with non-compliance with regulations. This also reduces cost. With changing customer preferences and a shift towards green purchasing and consumption, GEO allows a firm to be proactive and gain first-mover competitive advantage. This can translate to higher sales and greater profitability. Demirel et al. (2019) find that green entrepreneurship enhances firm performance through cost-efficiency, and revenue growth as a result of product differentiation.

The results support a significant positive relationship between GEO and EP. The results indicate that GEO can help to improve the environmental performance of firms. This finding is supported by previous empirical studies (Ge et al. 2016; DiVito and Bohnsack, 2017. Jiang et al. 2018). GEO through the creation of green products and services reduces energy and water consumption and decreases waste, emissions and pollution. GEO also enhances firm environmental compliance while ensuring employee and customer safety (Dickel, 2018). The results also support a significant positive relationships between GEO and SP. This suggests that GEO helps to improve firm internal and external social performance. GEO can help to improve employee and customer satisfaction. Eco-friendly green revolution has penetrated the workplace and is changing the way that firm attract and retain talent. In addition, customers are becoming more environmentally conscious and making consumption decisions based on greening (Hussain et al. 2014). GEO also enhances the relationship with external stakeholders and makes a firm to be more socially responsible ((Mullens, 2019). Overall, the findings demonstrate a positive relationship between GEO and sustainable performance. The findings is consistent with The Natural-Resource Based View that GEO is seen as an important intangible resource that characterises a firm-level strategic organisational orientation. GEO helps a firm to discover and exploit green opportunities and depicts how a firm uses resources to achieve desired end and focuses on green innovativeness, proactiveness and the tendency to take risk with positive influences on performance. Sustainable firms must take into consideration GEO in order to achieve business success.

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Conclusion

Although tourism and hospitality can benefit the environment though conservation and preservation of nature, their activities also has the potential to destroy the natural environment in the communities where they operate. The hospitality sectors puts pressure on natural resources through high food, water, energy and raw material consumption. The factors that can affect a firm's sustainability initiatives are external and internal. External factors include government regulations and customers. A firm's internal structure and resources can also affect the level of aspiration for environmental sustainability. GEO involves green innovations and a proactiveness to capture green opportunities and risk-taking behaviour. One of the ways to examine the impact of a firm sustainability initiatives such as GEO is to measure their effect on performance. This study the sustainable or triple bottom-line approach to measure performance. The findings indicate a significant positive relationship between GEO and sustainable performance as measured by financial, environmental and social indicators. The findings of the study could help firms in the hospitality sector in to include GEO in their internal organisational processes and training to improve sustainability. In addition, the findings of the study can assist local and international government and non-governmental organisations that support entrepreneurship and sustainability to understand the effect of GEO on performance. This can influence the training programmes designed by these organisations to assist firms in the hospitality industry. The study has some limitations. The cross-sectional survey approach cannot be used to analyse behaviour of firms or the respondents over a period of time and this limits the cause and effect relationship. Also, only 192 firms participated in the study. Thus care should be exercised in generalising the findings of the study. Other studies can examine the effect of GEO on other measures of performance such as innovation and quality. The moderating effects of demographic variables (level of education, age and gender) as well as a longitudinal study on GEO and SP can be examined.

References

Acosta, P.; Cismaru, D.; Vătămănescu, E.; Ciochină, R. 2016. Sustainable Entrepreneurship in SMEs: A Business Performance Perspective. Sustainability 8(4): 1-12. https://doi.org/10.3390/su8040342

Ahmad, K.; Zabri, S. The Application of Non-Financial Performance Measurement in Malaysian Manufacturing Firms. Procedia Economics and Finance, 35: 476-484. https://doi.org/10.1016/S2212-5671(16)00059-9

Amankwoh-Amoah, J.; Adomako, S.; Danso, A. 2018. Entrepreneurial orientation, environmental sustainability and new venture performance: Does stakeholder integration matter? Business Strategy and the Environment, 28:79–87. https://doi.org/10.1002/bse.2191

Arabatzis, G., Galatsidas, S., Intze, C., Chalikias, M., Tsiantikoudis, S. & Mamalis, S. 2015. Green Entrepreneurship and Green Products: Consumers' Views and Attitudes in Regional Unit of Evros. In: Proceedings of the 7th International Conference on ICT in Agriculture, Food and Environment (HAICTA 2015). Kavala, September 2015. Athens: HAICTA, pp. 291-297

Barney, J. B. 1986. Organizational culture: Can it be a source of sustained competitive advantage. Academy of Management Review, 11: 656–665. https://doi.org/10.2307/258317

Barney, J. B. 1991. Firm resources and sustained competitive advantage'. Journal of Management, 17: 99–120. https://doi.org/10.1177/014920639101700108

Brundtland Report. Our Common Future. 1987. Available online: Retrieved from https://www.are.admin.ch/are/en/home/sustainable-development/international-cooperation/2030agenda/un-_-milestones-in-sustainable-development/1987--brundtland-report.html

Casey, D.; Sieber, S. 2016. Employees, sustainability and motivation: Increasing employee engagement by addressing sustainability and corporate social responsibility. Research in Hospitality Management, 6(1): 69–76. https://doi.org/10.2989/RHM.2016.6.1.9.1297

Chin, W.W. 2010. Bootstrap cross-validation indices for PLS path model assessment. In: EspositoVinzi, V., Chin, W.W., Henseler, J., Wang, H. (eds.) Handbook of Partial Least Squares: Concepts, Methods and Applications, pp. 83–97. Springer, Heidelberg.

Covin, JG.; Wales, WJ. 2012. The measurement of entrepreneurial orientation. Entrepreneurship: Theory & Practice, 36(4): 677–702. https://doi.org/10.1111/j.1540-6520.2010.00432.x

Deale, C.S. 2013. Sustainability Education: Focusing on Hospitality, Tourism, and Travel. Journal of Sustainability Education, 4:1-20.

Dean, T,; McMullen, JS. 2007. Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. Journal of Business Venturing, 22(1):50-76. https://doi.org/10.1016/j.jbusvent.2005.09.003

Demirel, P.; Li, Q.; Rentocchini, F.; Tamvada, J. 2019. Born to be green: new insights into the economics and management of green entrepreneurship. Small Business Economics, 52(4):759-771. https://doi.org/10.1007/s11187-017-9933-z

Dickel, P. 2018. Exploring the role of entrepreneurial orientation in clean technology ventures. International Journal of Entrepreneurial Venturing, 10(1): 56-82. https://doi.org/10.1504/IJEV.2018.10008384

DiVito, L.; Bohnsack, R. 2017. Entrepreneurial orientation and its effect on sustainability decision tradeoffs: the case of sustainable fashion firms. Journal of Business Venturing, 32(5): 569-587. https://doi.org/10.1016/j.jbusvent.2017.05.002

Elkington, J. 1998. Accounting for the triple bottom line. Measuring Business Excellence, 2(3):.18-22. https://doi.org/10.1108/eb025539

Fermani, A.; Crespi, I.; Stara, F. 2016. Sustainable hospitality and tourism at different ages: Women's and men's attitudes in Italy. Research in hospitality Management, 6(1):83-92. https://doi.org/10.2989/RHM.2016.6.1.11.1299

Freeman, R.E. 1984, Strategic Management: A Stakeholder Approach. Pittman, Marshfield, MA.

Ge, B.; Jiang, D.; Gao, Y.; Tsai, S. 2016. The Influence of Legitimacy on a Proactive Green Orientation and Green Performance: A Study Based on Transitional Economy Scenarios in China. Sustainability, 1-20. https://doi.org/10.3390/su8121344

Gibbs, D.; O'Neill, K. 2014. Rethinking sociotechnical transitions and green entrepreneurship: The potential for transformative change in the green building sector. Environment and Planning, 46:1088-1107. https://doi.org/10.1068/a46259

Haenlein, M,; Kaplan, A. 2004. A Beginner's Guide to Partial Least Squares Analysis. Understanding Statistics, 3(4): 283-297. https://doi.org/10.1207/s15328031us0304_4

Hair, J.F.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V. 2014. Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool for Business Research. European Business Review, 26(2):106-121. https://doi.org/10.1108/EBR-10-2013-0128

Haldar, S. 2018. Green entrepreneurship in the renewable energy sector – a case study of Gujarat. Journal of Science and Technology Policy Management, 10(1):234-250. https://doi.org/10.1108/JSTPM-12-2017-0070

Hart, SL. 1995. A Natural-Resource-Based View of the Firm. The Academy of Management Review, 20(4): 986-1014. https://doi.org/10.2307/258963

Hemmington, N. 2007. From Service to Experience: Understanding and Defining the Hospitality Business. Service Industries Journal. 27(6):747-755. https://doi.org/10.1080/02642060701453221

Hernandez-Perlines, P.; Cisneros, M. 2018. The Role of Environment in Sustainable Entrepreneurial Orientation. The Case of Family Firms. Sustainability. 10: 1-16. https://doi.org/10.3390/su10062037

Hong, J.; Cho, D. 2012. The Effects of Market Orientation, Entrepreneurial Orientation and Social Networks on the Social Performance of Non-profit Organizations. In: Kim T., Mohammed S., Ramos C., Abawajy J., Kang BH., Ślęzak D. (eds) Computer Applications for Web, Human Computer Interaction, Signal and Image Processing, and Pattern Recognition. ICHCI 2012, WSE 2012, SIP 2012. Communications in Computer and Information Science, vol 342. Springer, Berlin, Heidelberg

Hotrec Hospitality Europe, 2018. The hospitality industry's contributions to European economy society. Retrieved from https://www.hotrec.eu/facts-figures/

Jiang, W.; Chai, H.; Shao, J,; Feng, T. 2018. Green entrepreneurial orientation for enhancing firm performance: A dynamic capability perspective. Journal of Cleaner Production, 198:1311-1323. https://doi.org/10.1016/j.jclepro.2018.07.104

Idahosa, L.; Marwa, N.; Akotey, J. (2017) Energy Consumption in South African Hotels: A Panel Data Analysis. Retrieved fromhttps://econrsa.org/system/files/publications/working_papers/working_paper_685.pdf

Kock, N. 2015. Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4): 1-10. https://doi.org/10.4018/ijec.2015100101

Küçükoğlu, M.T.; Pınar, R.İ. 2015. Positive influences of green innovation on company performance. Procedia-Social and Behavioural Sciences, 195: 1232-1237.

Kolawole, I.O.; Mbaiwa J.E; Mmopelwa, G 2016. The environmental impacts of tourism on community people's quality of life in Maun, Botswana. The environmental impacts of tourism on community people's quality of life in Maun, Botswana. African Journal of Hospitality, Tourism and Leisure, 5(4): 1-14.

Kirkwood, J and Walton, S. 2010. What motivates ecopreneurs to start businesses? International Journal of Entrepreneurial Behavior & Research, 16(3): 204-228. https://doi.org/10.1108/13552551011042799

Low, M.; Thurasa, R. 2016. Entrepreneurial Orientation and Social Responsibility of Small Medium Sized Enteprises located in Selangor. Business and Social Entrepreneurship, 1(2):1-14.

Lumpkin, G.T.; Dess, G.G. 1986. Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance. The Academy of Management Review, 21(1):135-172. https://doi.org/10.2307/258632

Maletic, M.; Maletic, D.; Dahlgaard, J.; Dahlgaard-Park, S.; Gomiseek, B. 2016. Effect of sustainability-oriented innovation practices on the overall organisational performance: an empirical examination. Total Quality Management and Business Excellence, 9/10; 1171-1190. https://doi.org/10.1080/14783363.2015.1064767

Magsi, H.; Ong, T.; Ho, J.; Hassan, A. 2018. Organizational Culture and Environmental Performance. Sustainability, 10(8); 2690-2707. https://doi.org/10.3390/su10082690

Mbasera, M.; Du Plessis, E.; Saayman, M; Kruger, M. 2016. Environmentally-friendly practices in hotels. Acta Commercii, 16(1); a362. http://dx.doi.org/10.4102/ac.v16i1.362

Melissen, F. 2013. Sustainable hospitality: A meaningful notion? Journal of Sustainable Tourism 21(6): 810–824. https://doi.org/10.1080/09669582.2012.737797

Merriman, K.K.; Sen, S.; Felo, A.J.; Litzky, B.E.2016. Employees and Sustainability: the role of incentives. Journal of Managerial Psychology, 31: 820–836. https://doi.org/10.1108/JMP-09-2014-0285

Miller, D. 1983. The correlates of entrepreneurship in three types of firms. Management Science, 29(7): 770–791. https://doi.org/10.1287/mnsc.29.7.770

Mjongwana, A.; Kamala, P. 2018. Non-financial performance measurement by small and medium sized enterprises operating in the hotel industry in the city of Cape Town. African Journal of Hospitality, Tourism and Leisure, 7(1):1-26.

Mullens, D. 2018. Entrepreneurial orientation and sustainability initiatives in family firms. Journal of global responsibility, 9 (2): 160-178. https://doi.org/10.1108/JGR-03-2017-0020

Nappi, V.; Rozenfeld, H. 2015. The Incorporation of Sustainability Indicators into a Performance Measurement System. Procedia CIRP, 26: 7-12. https://doi.org/10.1016/j.procir.2014.07.114

Nikolaou, I. E.; Tasopoulou, K.; Tsagarakis, K. 2018. A Typology of Green Entrepreneurs Based on Institutional and Resource-based Views. The Journal of Entrepreneurship, 27(1): 111-132. https://doi.org/10.1177/0971355717738601

Ning, Y.; Wang, W.; & Yu, B. 2015. The driving forces of venture capital investments. Small Business Economics, 44(2): 315–344. https://doi.org/10.1007/s11187-014-9591-3

Nunnally, JC 1978. Psychometric theory. McGraw-Hill, New York.

Ottenbacher, M; Harrington, R.; Parsa, H. 2009. Defining the hospitality discipline: A discussion of pedagogical and research implications. Journal of Hospitality & Tourism Research, 33(3): 263-283. https://doi.org/10.1177/1096348009338675

Pacheco, D.F.; Dean, T.J.; Payne, D.S. 2010. Escaping the Green Prison: Entrepreneurship and the Creation of Opportunities for Sustainable Development. Journal of Business Venturing, 25(5): 464-480. https://doi.org/10.1016/j.jbusvent.2009.07.006

Parish, A. 2010. Sustainability-driven entrepreneurship: Principles of organization design. Journal of Business Venturing, 25, 510-523. https://doi.org/10.1016/j.jbusvent.2009.05.005

Pramanik, P.D.; Ingkadijaya, R. 2018. The Impact of Tourism on Village Society and its Environmental. IOP Conference Series: Earth and Environmental Science, 145: 1-9. https://doi.org/10.1088/1755-1315/145/1/012060

Pratono, A.H. 2018. From social network to firm performance: the mediating effect of trust, selling capability, and pricing capability. Management Research Review, 41(6): 680-700. https://doi.org/10.1108/MRR-03-2017-0080

Qorri A.; Mujkić Z.; Kraslawski A. 2018. A conceptual framework for measuring sustainability performance of supply chains, Journal of Cleaner Production, 189: 1-32. https://doi.org/10.1016/j.jclepro.2018.04.073

Rauch, A.; Wiklund, J.; Lumkpkin, G.T.; Frese, M. 2009. Entrepreneurial Orientation and Business Performance: An Assessment of Past Research and Suggestions for the Future. Entrepreneurship Theory and Practice, 33(3_: 761-787. https://doi.org/10.1111/j.1540-6520.2009.00308.x

Shrivastava, M.; Tamvada, J.P. 2017. Which green matters for whom? Greening and firm performance across age and size distribution of firms. Small Business Economics, 52(4): 951–968. https://doi.org/10.1007/s11187-017-9942-y

Spence, M.; Gherib, J,; Biwolé, V. 2010. Sustainable Entrepreneurship: Is Entrepreneurial will Enough? A North–South Comparison. Journal of Business Ethics, 99(3): 335-367. https://doi.org/10.1007/s10551-010-0656-1

Statistics South Africa. 2018. How important is tourism to the South African economy? Retrieved from http://www.statssa.gov.za/?p=11030

Vosper, S.; Mercure, J. 2016. Assessing the effectiveness of South Africa's emissions-based purchase tax for private passenger vehicles: A consumer choice modelling approach. Journal of Energy Efficiency in Southern Africa. 27(4):25-37. http://dx.doi.org/10.17159/2413-3051/2016/v27i4a1436

United Nations World Tourism Organisation 2018. Tourism Definitions Retrieved from http://publications.unwto.org/publication/UNWTO-Tourism-definitions

United Nations World Tourism Organisation 2018. Definition of Sustainable tourism. Retrieved from http://www2.unwto.org/content/about-us-5

Urban, B.; George, J. 2018. An empirical study on measures relating to impact investing in South Africa. International Journal of Sustainable Economy, 10(1): 61-77. https://doi.org/10.1504/IJSE.2018.088622

Van Rheede, A.; Blomme, R.J. 2012. Sustainable Practices in Hospitality: A Research Framework. Advances in Hospitality and Leisure (Advances in Hospitality and Leisure, 8: 257-271.

Wales, WJ.; Gupta, VK.; Mousa, F.T. 2013. Empirical research on entrepreneurial orientation: An assessment and suggestions for future research. International Small Business Journal 31(4): 357–383. https://doi.org/10.1177/0266242611418261

Wiklund, J.; Shepherd, D. 2011. Where to from here? EO-as-experimentation, failure, and distribution of outcomes. Entrepreneurship: Theory & Practice, 35(5): 925–946.

World Travel and Tourism Council 2018. Travel & tourism economic impact. South Africa https://tbcsa.travel/wp-content/uploads/2018/03/WTTC-Report-SouthAfrica2018.pdf

Yang, M.G.M.; Hong, P.; Modi, S.B. 2011. Impact of Lean Manufacturing and Environmental Management on Business Performance: An Empirical Study of Manufacturing Firms. International Journal of Production Economics, 129(2):.251–261. https://doi.org/10.1016/j.ijpe.2010.10.017

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REALIZATION OF PPP PROJECTS IN THE SECTOR OF ENERGETICS AS A CONDITION OF A SUSTAINABLE DEVELOPMENT OF MACROREGIONS*

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Abstract. The article deals with the problems of implementation of public-private partnership programs in the energy sector aimed at ensuring the sustainable development of macro-regions. It is determined that in the financing of PPP energy projects, the World Bank institutions evaluate the projects for the selection of the most effective and ready for implementation, based on a variety of criteria. This assessment gives priority to projects that are based on renewable energy sources and those that are more environmentally friendly. The problems and uncertainties associated with the implementation of PPP projects in the energy sector are identified.

Keywords: sustainable development; public-private partnership projects; energy sector; World Bank; macro-regions; project evaluation and selection; financing; funding organization

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JEL Classifications: O19, O57, P18, Q42, Q43

1. Introduction.

Disproportions, appearing in the structure of economics, its low economic efficiency (both of parts of it and in general) can lead to a slowdown of a sustainable development and an emergence of regions inside the countries

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and macro regions with negative dynamics of readings of socio-economic development. This situations is at dissonance with an accepted concept of the sustainable development and can contribute to stagnation of economics increase in poverty and growth of other economic and social problems on a global scale. Support of the regions and countries provided by state bodies, international financial institutions and a private sector is becoming an important task directed towards forming modern infrastructure especially of facilities in the sector of energetics, creating a foundation for industrial and socio-economic development. Applying the mechanisms of public-private partnership creates conditions for attraction of resources of big private investors and credit resources of banks, including international financial institutions.

In this regard, it is important to conduct a comprehensive study of the problems of public-private partnership projects in the field of energy to ensure sustainable development of various regions of the world, as well as the evaluation of projects, the choice of those that will receive financial support from international financial institutions.

2. Interconnection and interdependence of development of energetics and the sustainable development

A sustainable development, the concept of which was first introduced by The United Nations Conference on Environment and Development (UNCED) in 1992 supposes development, allowing sustainable long term economic growth not leading to environmental degradation (Earth summit 1992). Achievement of the stable economic growth will require changes in the way manufacturing processes is organized, types and volume of resources used and also in products manufactured. (National Research Council 1995) A shift towards sustainable development presupposes that "Industrially developed countries would have to take special responsibility not only because of their ecological sins of the past but also for their current technological know-hows and financial resources" (A. Merkel 1997). Stable progressive advance both of separate regions and countries in general is primarily connected with a necessity of forming modern competitive structure of economics based on high-tech and power-efficient manufactures organized in such a way to minimize and reuse existing waste products. In turn, the creation of a modern structure of the economy is largely determined by the existing level of energy supply of industrial programs of economic entities and capacity to increase energy capacity while increasing the need for them.

Over the past decades of multiple discussions about a connection between energetics, environment and society, international community has officially recognized a deep interconnection between energetics and the sustainable development (Colombo E., Mattarolo L. 2017; Tvaronavičienė, M., Nesterova, K., Kováčik, V. 2017; Smaliukienė, R. Monni, S. 2019; Masood, O., Tvaronavičienė, M., Javaria, K. 2019; Sarma, U., Karnitis, G., Zuters, J., Karnitis, E. 2019).

In addition, it is shown that sustainable development largely depends on the evolution of energy technologies. If dependence on fossil fuels is unavoidable in the short term, renewable energy based on solar and wind energy or biomass will be preferred in the long term. (National Research Council 1995) In the future, nuclear energy will continue to be important, provided that nuclear facilities are used safely and the nuclear waste generated there is carefully managed. Safe nuclear energy is an indispensable source that provides new opportunities for energy conservation, distribution and use.

The directions of development of the world economy until 2030 define access to electricity as a necessary condition for the fight against poverty, since the provision of affordable, efficient, stable, safe and clean energy in sufficient quantities is not yet available to all (Colombo E., Mattarolo L. 2017).

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If nowadays the biggest success is achieved in usage of wind power, in mid-term there will be growth in importance of solar energy with usage of photoelectric technologies" (A. Merkel 1997). Nuclear power would not stop to be used either. In the last decade, both developed and developing countries pay great attention to alternative energetics on foundation of renewable energy sources in their programmatic documents. It is not a coincidence that the major international specialized exhibition "EXPO 2017. Astana" held under the motto "Energy of the future" was devoted to power-saving and alternative energy sources, development of "green" technologies, and forms of participations of businesses and governments in such projects (Expo 2017 in Astana).

At the same time, the modern reality is that when implementing sustainable economic development programs, most enterprises, along with the accumulation of material, labor and financial resources, face a serious problem caused by the complete or significant lack of power supply facilities, energy generation systems, transmission and distribution systems. Underdevelopment of sector of energetics or its lagging behind in its turn doesn't allow creating and developing industrial, engineering transport and social-domestic infrastructure facilities, expand and modernize existing manufactures. The problem of energy supply and access is particularly acute for developing countries (Agarchand N., Laishram B. 2017; Chotia, V., Rao, N. V. M. 2018; Ebhota, W. S., Inambao, F. L. 2017; Kwame A. 2011; Luo, Z., Yang, K., Cen, K., He, J., Han, T. 2018; Ogundari, I. O., Otuyemi, F. A. 2009).

Sub-Saharan Africa and South Asia have the largest electricity deficit. In these regions, energy facilities are created mainly from scratch, using new technologies and capacities, mainly based on renewable energy sources. The capacity of these countries is limited and such projects are unlikely to be implemented without the participation of the private sector. The countries of South Asia are not sufficiently provided with energy, despite the projects implemented here, which are significant for the energy sector. The region also needs large investments for further energy development (Analysis of voluntary national reviews related to sustainable development 2018).

A serious problem of many macro regions is an existing gap in availability of electric power between urban and rural areas which is typical for almost 87% of world's population. In recent times developed countries face this problem as well, during introduction of alternative energy projects, which also supposes large investments which could be raised by combining state's sources of funding and private equity (Merkel A.1997; Daniel, Z., Craig, D., Schaich, L., Morgan, S. 2019; Ebhota, W. S., Inambao, F. L. 2017). Therefore, the main efforts in the future should be aimed at improving the efficiency of energy supply and consumption, the use of less polluting fuels, as well as the search for and pooling of sources of financing in these areas.

3. Realization of PPP projects in the sector of energetics with support of The World bank: State and tendencies of financing

Realization of the projects in the area of energetics, even not large ones presupposes substantial value of capital investments, great pay-off period, high risks, therefore its realization by capacities of only economic entities, regions, and separate countries becomes a task difficult or often impossible to implement. In projects of this scale in the energy sector, the development of alternative energy sources, it is advisable to combine the efforts of the state and business on PPP terms with the involvement of international financial institutions.

Quite a wide range of issues related to the use of public-private partnership in the energy sector in different regions of the world is reflected in the modern literature (for example, Agarchand N., Laishram B. 2017, Romero M.J. 2015, Chotia, V., Rao, N.V.M. 2018, Daniel, Z., Craig, D., Schaich, L., Morgan, S. , Delmon J. 2010, Ebhota, W. S., Inambao, F. L. 2017, Kwame A.2011, Luo, Z., Yang, K., Cen, K., He, J., Han, T. 2018, Ogundari, I. O., Otuyemi, F. A. 2009, Xu, Y., Chang, W. 2017) The above authors have made a significant contribution to the development of research on this topic. Summing up the results of the study, the following points can be noted.

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Participation of the state in energy projects as a concession or a mechanism of public-private partnership is a fairly common practice all over the world. This is due to the fact that although such projects are quite capital-intensive and have a long payback period, they are also, due to the scale, are the most promising. When implementing PPP projects in the field of energy, both specific features (seasonal and daily fluctuations in energy consumption) and possible risks (risk in the sale of future products, the risk of price fluctuations, the risk of developing alternative energy sources, environmental risk, etc.).

Recent energy projects have been implemented in developing countries, including with the participation of foreign private investors in public - private partnerships. Such projects are actively supported by the World Bank Group, other international financial and credit institutions and private investors. In the period years 2009-2013 there was a tendency of outstripping growth of investments in energy on the basis of PPP projects, but in years 2014-2015 investments in the transport sector took the first place. The years 2016-2017 were again marked by an increase in investment in energy, thanks to the implementation of 6 large-scale PPP projects to generate electricity in Indonesia, Pakistan and Jordan. In 2017, investments were made in 10 PPP projects in Vietnam, 9 of which use renewable energy sources and 1 energy mega-project using coal worth 1.9 billion USD (Private Participation in Infrastructure (PPI) 2018).

In 2017, investments in Indonesian energy PPP projects increased by a total of 8.2 billion USD, including 2 coal mega-projects by 4.2 and 2.2 billion USD. In 2018, the volume of PPP investments in the country's energy projects fell to 1.1 billion USD; only 4 energy projects were supported. Despite the increase in credit investments in PPP projects since 2016, there is a decrease in the investment share of the private sector in energy projects due to the growth of investments in transport. In the year 2016 this share was 66%, in the year 2018 it declined to 36%. However, compared with other sectors of economics, energy PPP projects are still attractive for investments and are more than a third of them (Private Participation in Infrastructure (PPI) 2018).

International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) as the biggest structures of The World Bank are actively participating in financing PPP energy projects in participating countries which is shown in the given data in the context of macro regions (Table 1).

Table 1. Dynamics of crediting by IBRD and IDA in the sector of energetics in the context of regions in 2014-2018, million USD

Sector	South Africa	East Asia and Pacific Region	Europe and central Asia	Latin America an the Caribbean	Middle East and North Africa	South Asia	Total
IBRD obligations							
Total, all sectors of economics	4,58	22,28	26,567	27,624	21,866	14,557	117,474
Including							
Energetics	1,063	3,021	5,449	1,665	4,183	2,62	18,001
In% of the total loans granted	23,2	13,6	20,5	6,0	19,1	18,0	15,3
IDA obligations							
Total, all sectors of economics	55,339	9,593	3,256	1,889	1,85	28,923	100,849
Including							
Energetics	8,574	832	600	67	138	4,426	14,637
In% of the total loans granted	15,5	8,7	18,4	3,5	7,5	15,3	14,5

Source: compiled by the authors on the basis of: Private Participation in Infrastructure (PPI) 2018.

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In terms of the volume of loans provided by IBRD to PPP projects in the energy sector, the three leaders are the countries of Europe and Central Asia, the Middle East and North Africa, East Asia and the Pacific. Their share of credits is 12,7 billion USD out of total credit value of 18 billion USD or almost 11% out of those given to all Economic sectors. In terms of loans to IDA Members for PPP projects in the energy sector, countries in Africa and South Asia stand out significantly. Their share is 13 billion USD with total loans of 14.6 billion USD, or 13% of those issued to all countries in all sectors of the economy.

Considering that these macro regions suffer from substantial lack of electric power, governments of the countries together with IDA and private investors make large capital investments into PPP projects in energetics, allowing to develop economics, fight poverty and solve socially important questions. In total, 113 PPP projects in the energy sector of 58 countries were supported for the period 2014-2017, totaling 22,292 million USD. In 2017 in the countries - IDA members financial closing was achieved in 27 PPP projects in the sector of energetics realized in 16 courtiers at the total sum of 4180,13 million USD. In 7 countries, the projects are related to the creation of solar power plants (Afghanistan, Burkina Faso, Cambodia, Honduras, Mozambique, Senegal, Zambia), which is 26% of the projects, 9 projects (33%) are related to the construction of hydroelectric power plants. (Laos, Nepal, Uganda etc.). The projects of creating power plants powered by gas (1 project), mazut (3 projects), wind energy (2 projects), thermal energy were realized. Floating power plant in Ghana and combined cycle power plant are being built 24 out of creating projects are completely new and 3 are carried out based on existing facilities. Most of the projects are implemented in 8 countries, which is 70% of all investments in 79 PPP projects. Most of the financial assistance was provided to Ghana, Lao PDR, Honduras (Table 2).

Table 2. IDA countries with the highest investment and the number of PPP projects in the energy sector

Countries eligible for IDA support	Investments in millions of US dollars						Number of projects
	2013	2014	2015	2016	2017	in total	2013-2017
Countries total 58	2971	5438	2997	2959	7927	22292	113
Including countries with most projects							
Bangladesh	42	595	304	170	618	1727	11
Ghana	453	912	0	2252	550	4168	7
Honduras	1510	593	524	349	260	3237	24
Lao PDR	0	2050	0	0	1850	3900	5
Mozambique	184	203	0	0	357	744	5
Nepal	0	150	354	26	258	708	9
Senegal	136	342	324	76	114	991	11
Uganda	0	0	46	64	19	129	7
Total countries of most investment value in PPP projects in energetics	2325	4845	1552	2937	4026	15604	79
The share of countries with the largest number of projects in the total investment value	78,3	89,1	51,8	99,3	50,8	70,0	69,9

Source: compiled by the authors on the basis of: Private Participation in Infrastructure (PPI). 2018

State Bodies and World Bank structures took part in financing PPP projects alongside with different corporate bodies and also numerous regional national and international banks and other financial and credit institutions. This is due to the fact that although energy projects require large investments, they have moderate risks and

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appropriate cost recovery, especially given that their implementation uses mainly renewable energy sources. (Table3).

Table 3. Sponsors and financing banks with biggest shares in PPP projects in energetics

IDA Countires	Sponsors	Project Banks
Including the countries with the largest number of projects		
Bangladesh	SembCorp Industries, North West Power Generation Company, Doreen Group	IFC, Clifford Capital, Commonwealt Development Corporation
Ghana	Sunseap Group, Karadeniz Energy Group	ADB
Honduras	Upower Group, Grupo Terra	FMO, DEG, G&T Continental Bank, Agence Francaise de Developpement (AFD)
Lao PDR	Phonesack Group, Electricity Generating Company (EGCO), EDL-Generation Public Company (EDL-Gen), Mega First Corp., Électricité du Laos (EDL), B. Grimm Group	Bangkok Bank,, Thai Exim Bank, Siam Commercial Bank, Tisco Bank
Mozambique	Electricidade de Moçambique (EDM), Sasol, Scatec , Electricidade de Moçambique (EDM), Norfund	IFC, FMO, EAIF, Agence Francaise de Developpement (AFD), Barclays, Climate Investment Funds , Private Infrastructure Development Group (PIDG)
Nepal	Butwal Power Company (51%) Gurans Energy Limited (44%) Asia Pacific Power-Tech Co. Ltd (5%), Ngadi Group Power (Butwal Power Company (97%) Lamjung Electricity Development Company (LEDCO) Beni Hydropower Project	IFC, IDA, NMB Bank (NMB), Prabhu Bank, Mega Bank, Century Bank, NCC Bank, Kumari Bank, Everest Bank, Nabil Bank, Global IME Bank, Himalayan Bank, Sunrise Bank,) Hydroelectricity Investment and Development Company, Nepal Bangladesh Bank,, Vibor Society Development Bank, Siddhartha Bank
Senega	ContourGlobal, Matelec, International Finance Corporation, Small international investors	OPIC EAIF, IFC, BOAD, FMO
Uganda	Lereko Investments, WK Power (WK) and Fieldstone Africa Investment Resources (FAIR)	OPIC

Source: compiled by the authors on the basis of: Private Participation in Infrastructure (PPI) 2018

In 2018, there was a significant increase in funding for PPP projects, which amounted to 15.7 billion USD. Almost 50% of them are investments in energy projects, mainly related to the transmission and distribution of energy. 78 out of 84 new PPP projects in the energy sector based on renewable energy sources were submitted for approval, which is on average more than in the previous 5 years. (93% of all completed projects). The largest financial support for the implementation of PPP projects in the energy sector was provided in 2018 to the following countries: Vietnam 11 projects 3.4 billion USD; Mexico, 7 projects 1.8 billion USD; South Africa 5 projects 1.6 billion USD; India 9 projects 1.1 billion USD.

During the last decade most attention of the investors is being paid to energy projects using renewable energy sources. It is among the countries with the support of IDA and without it. It should be noted that the share of PPP projects in renewable energy in IDA countries was lower than in non-IDA countries, although the growth rate of such projects in IDA countries was significantly higher than in other countries. (Table 4).

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Table 4. Investments in public-private partnership projects in the field of renewable energy in 2013-2017

Year	2013	2014	2015	2016	2017
IDA Countries					
PPP projects in the field of renewable energy sources (number of)	3	13	5	10	19
PPP Projects in the field of non-renewable energy sources (number of)	5	9	3	3	8
Share of Renewable Energy Projects (% of electricity generation projects in IDA countries)	38	59	63	77	70
Investments in Renewable Energy Projects (US$ Mn)	326	2985	481	515	2994
Share of Renewable Energy Investments (% of electricity generation investments in IDA countries)	22	57	28	26	71
Non- IDA Countries					
No. of Renewable Energy Projects	177	138	159	116	147
Share of renewable energy projects in total energy sector projects	83	87	30	88	91
Investments in Renewable Energy Projects (US$ Bn)	22,3	17,3	19,4	20,3	20,1
Share of Renewable Energy Investments	42	37	55	47	48

Source: compiled by the authors on the basis of Private Participation in Infrastructure (PPI) 2018

In 2018, investments in PPP projects using renewable energy sources amounted to 64%, and traditional sources. 36% (coal energy mega-projects in Vietnam and Pakistan, natural gas - in Brazil). Projects based on renewable energy sources are arranged in the following way 35% are founded on solar energy, 22% on wind energy, 5% on geothermal energy, 1% to water and biomass energy, 0.5% on usage of wastes. Solar energy has become predominant; 49 projects have been registered in 23 countries. Leaders are 6 projects in India, Brazil, Vietnam and Ukraine (5 projects each). Wind energy is used in 20 PPP projects in 7 countries.

In the countries of Europe and Central Asia, the energy infrastructure has been mainly established for a long time, so the public-private partnership projects implemented here are mainly aimed at its modernization, increase in repair capacity or transfer to renewable and more environmentally friendly energy sources. Developed European countries are implementing programs for the introduction of solar street lights, using modern technologies such as solar panels, as well as developing alternative power sources. In the CIS countries, projects in the energy sector also do not lead in the structure of the overall financing of infrastructure projects. For example, the share of financed projects in the energy sector was only 4%. IBRD and IDA financed 2 projects in Uzbekistan on the implementation of energy-saving technologies in industry and energy efficiency of heat supply, which amounted to 18% of the total funding in this sector.

4. Status of PPP projects in the energy sector in Russia

Russia, as one of the major subjects of this macro region, over the past decade has turned from a borrower into an active lender, so the volume of loans in this area is not so great. Only 3 projects of construction of solar power plants in Russia were supported by the World Bank, which accounted for about 11% of investments among all PPP projects. The small amount of them is also caused by the fact that during the last 10 years the country experiencing a large-scale modernization in energy industry, which required substantial investments, therefore large investors independently or with help of foreign investors either completed investing in this sector or will do so in the next 2-3 years. The experience of PPP projects implementation exists in the country, but these are not large-scale projects, but projects at the regional and municipal level, so they are financed by public authorities and private companies of the same level, with occasional participation of international organizations. Analysis of the PPP projects in energetics that are being realized in Russia in the last 10 years (since 2009) allows to evaluate general condition of the sector of energetics in Russia. (Table 5).

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Table 5. PPP Projects in energetics in general structure of PPP projects in Russia

PPP projects	Number of units	Shate in total , %	Value of investments	Share in value of investments, %	Value of investments per project (on average) mill USD.
Total including	3939	100	82170	100	21
In the sector of energectics	1626	41	3566	4	2

Source: Compiled by the authors based on data from Project initiatives support programme 2019. PPP Development Center

During the study period, energy projects accounted for the main share - 41% or 1626 projects in the total volume of PPP projects. The volume of investments in energy projects is 3566 million USD, which corresponds to only 4% of the total cost of investments in PPP projects. The average cost of investment in a PPP project in the energy sector is only us 2 million USD, which is significantly lower than for projects in other sectors of the economy. The analysis confirms that in the Russian energy sector a large number of PPP projects are small in size and are implemented mainly at the regional or municipal level. (Figure 1, 2).

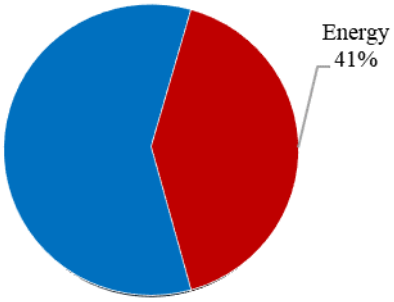

Figure 1. Share of energy projects in total PPP projects in Russia

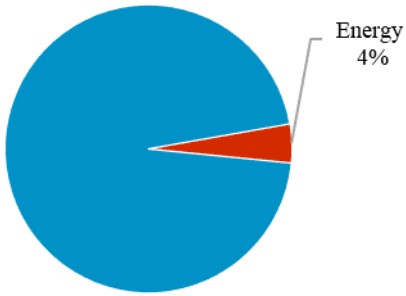

Figure 2. Share of investments in energy projects in total investment in PPP projects in Russia

Source: Compiled by the authors based on data from Project initiatives support programme 2019. PPP Development Center.

When considering PPP projects realized in Russian sector of energetics in general it can be easily noticed that both in amount (94%) and value of investments (68%) predominant projects are the ones connected with heat supply. Energy supply projects account for 5 per cent of the total, while the share of investment is 32 per cent. However, the average project price in the energy sector is high. 13 million USD. This complicates the search for investors who would be willing to invest in expensive technically complex objects. (Table 6).

Table 6. The classification of PPP projects in the energy sector in Russia

PPP Projects in energetics	Number of projects, units.	Share in Total %	Value of investments mill USD	Share in total value of investments, %	Value of investments per project (average) mill USD
Total, including	1626	100	3566	100	2
-Heat supliues	1530	94	2417	68	2
Power supplies	88	5	1132	32	13
Gas supplies	8	1	16	1	2

Source: Compiled by the authors based on data from Project initiatives support programme 2019, PPP Development Center

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A conducted research has shown that projects in building of objects both of traditional and alternative energetics makes up to insignificant share in the structure of PPP projects in Russia. (6.2%). Projects in alternative energetics are corresponding with 5% of total investment value or with 178 million USD. (Table 7). It is significantly less than the same showings in the other countries of the world. (Data in table 4).

Table 7. Projects in building new objects and alternative energy projects in the structure of PPP projects in energetics in Russia

PPP Projects in energetics	Number of projects, units.	Share in Total %	Value of investments mill USD	Share in total value of investments, %	Value of investments per project (average) mill USD
Total, including	1626	100	3566	100	2
Heat supplies	1530	94	2417	68	2
- Power suplies	88	5	1132	32	13
Gas suplies	8	1	16	1	2

Source: Compiled by the authors based on data from Project initiatives support programme 2019. PPP Development Center.

Average sum if investments per project in alternative energy are 58 million USD versus 11 million USD for objects in traditional energetics, which is significantly higher than the same showings in other PPP projects in energetics in Russia. Average price of a PPP project in building new objects in energetics is 5 times higher than average showings in the industry. High price of the projects hinders both technical improvements in the sector of energetics and development of alternative energy. In addition, the development of alternative energy in Russia is hampered by some other significant restrictions: most regions of the country do not suffer from a lack of capacity at existing power facilities; return on investment will need to be carried out by raising tariffs; in connection with the current realities of the market, the construction of new expensive energy facilities is unlikely to receive a positive response in the market.

Analysis of the state of PPP projects in energetics depending on the stage of realization has shown the following gradation (table 8).

Table 8. Classification of PPP projects in energetics depending of the stage of realization of the project in Russia

Stage of realization of PPP projects	Amount units	Share in total amount %	Value of investments mill USD	Share in value of investmens %	Value of investments per project o(on average mill USD
Pre-investment stage	329	20	1146	32	3
Investment stage	352	22	640	18	2
Operational stage	896	55	1760	49	2
Completion	49	3	20	1	0,4
Total PPP projects in energetics	1626	100	3566	100	2

Source: Compiled by the authors based on data from Project initiatives support programm. 2019. PPP Development Center.

Studies have shown that the share of completed projects is only 3%, the bulk of the projects – 55% is in operation, 42% are in the pre-investment and investment stages. The distribution of investments by stages of PPP projects shows that currently about 50% of the total investment, or 1.760 million USD, has been implemented in energy projects. Continuing PPP project realization practice presupposes that 1.786 million USD will be invested into energetics sector of Russia to finish announced projects, which means further development of sector of energetics in Russia. The need for investment in the industry is high and mainly related to the implementation of small-scale generation projects, as the infrastructure of the power supply system in Russia suffers from underinvestment for 20 years, and the wear of distribution and backbone networks has reached 70% and 50% respectively.

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5. Problems of evaluation and selection of PPP projects in the energy sector for financing by World Bank institutions

Selection of PPP projects for financing, including projects in the sector of energetics is a difficult task, despite the fact that World Bank's regulations have developed assessment methods considering and specializing aspects of assessment. This assessment at each stage of project development includes the following areas.

1. The preparation of PPP. The legal framework and institutional framework of PPP existing in different countries are studied.
2. PPP procurement-at this stage, the process of choosing a private partner-investor responsible for the development of the PPP project is considered. Criteria such as neutrality, transparency of the process of existence or lack of competition are also considered.
3. PPP contract management. This stage characterizes the change and renegotiation of the PPP contract, dispute resolution, contract termination procedure, control over the execution of the contract and its evaluation.
4. Unsolicited proposal (USPs PPP's). It is analyzed whether legal framework allows to present such projects, implement ability of the project and its agreement with other state priorities is defined, mechanisms of compensation in case of project's realization are considered, as well as if competition to select a private investor is required.

The assessment is based on standardized questions answered by more than 13,000 participants from 135 countries. The experts identified a specific set of areas and evaluation criteria that the project should meet to the maximum extent possible in the preparation, procurement, contract management and USP phases. The areas selected for evaluation were divided into a large number of criteria. An example of the integrated project evaluation areas used at the project preparation stage and the criteria (F) to be evaluated is shown in table 9. Similarly, other stages of PPP projects are being evaluated.

Table 9. Integrated assessment areas used in the PPP project preparation phase

№	Areas of assessment at the project preparation stage	Evaluation criterion			
	Preparation of PPPs	F1	F2	F3	F4
1.	Approval by the Ministry of Finance or central budgetary authority	+			
2.	Fiscal treatment of PPPs (budgetary, accounting and/or reporting treatment of PPPs).			+	
3.	Prioritization of PPP projects with all other public investment projects (for example, in the context of a national public investment system) to ensure consistency of PPPs with other public investment priorities.a		+		
4.	Socioeconomic analysis (cost-benefit analysis of the socioeconomic impact of the project).		+		
5.	Fiscal affordability assessment, including the identification of the required longterm public commitments (explicit and implicit)		+		
6.	Risk identification, allocation, and assessment (risk matrix).a		+		
7.	Comparative assessment to evaluate whether PPP is the best option as compared with other procurement strategies (value for money analysis, public sector comparator).		+		
8.	Financial viability or bankability assessment.		+		
9.	Market sounding and/or assessment (showing evidence of investors' interest in the market for the project).a		+		
10.	Environmental impact analysis.		+		
11.	Assessments included in the request for proposals and/or tender documents	+			
12.	Assessments published online.b	+			
13.	Draft PPP contract included in the request for proposals.	+			
14.	Tender documents published online.b	+			
15.	Standardized PPP model contracts and/or transaction documents developed				+

Source: Procuring Infrastructure Public-Private Partnerships Report: Assessing Government Capability to Prepare, Procure, and Manage PPPs

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The most significant criteria used for the evaluation of PPP projects at the stage of their preparation, the content and ranges of evaluation are given in table 10.

Table 10. Criteria used for selected assessment areas and their content

№	Evaluation criterion	Content of evaluation
1.	F1	A score of 1 if yes based on a regulatory provision. A score of 0.5 if yes based on a recognized practice
2.	F2	A score of 1 if required and a specific methodology has been developed. A score of 0.5 if required but no specific methodology has been developed. A score of 0.25 if conducted according to a recognized practice but without a specific methodology developed
3.	F3	A score of 0.5 if there is a specific budgetary treatment of PPPs, based on a regulatory provision. A score of 0.25 if yes based on a recognized practice. A score of 0.5 if there is a specific accounting and/or reporting system for PPPs, based on a regulatory provision. A score of 0.25 if yes based on a recognized practice
4.	F4	A score of 1 if yes.

Source: compiled by the authors on the basis of*:* Procuring Infrastructure Public-Private Partnerships Report: Assessing Government Capability to Prepare, Procure, and Manage PPPs

If results of assessment show that PPP project can score a maximum score reaching 100 which means that problems concerning its realization are worked out in detail, chances that it will be supported is much higher than for a project having lesser score and requiring revision both in legal framework and technical details. World bank's research devoted to analysis of the quality of project's preparation of public-private partnership projects (2018) covering 135 countries has shown a necessity in improving the quality of pre-project preparation for many of them, which proves importance of thorough assessment of PPP projects back at the stage of their development.(World Bank study: countries need to improve the quality of pre-project preparation 2018.).
In the evaluation process for the subsequent selection of projects for funding, there are certain difficulties and uncertainties faced by experts:

- The PPP projects under consideration are often implemented in the "monopolized sector", including in the energy sector, when the state tries to attract private capital to infrastructure projects, while remaining their owner;
- Such projects are characterized with large scales, a long run period of realization and high capital-intensiveness, lack of a long term guaranties to a private investor;
- Insufficient development of the regulatory framework for PPP projects at the level of a potential recipient of funding;
- Lack of trained professionals necessary qualifications for the preparation of project documentation, its justification and further implementation of PPP projects;
- Insufficiently high quality of the given results of technological audit which do not allow to estimate optimality of a complex of the technologies presented in the project;
- It is not always possible to determine the real effectiveness of the project and its socio-economic impact on the development of the region, especially in the long term;
- Difficulty in assessment both of project's quality and in defining and division of risks and responsibilities between the government and a private investor.

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6. Conclusions

Analysis of PPP projects in the energy sector with the support of the World Bank institutions led to a number of conclusions.

1. Priority financial support is given to projects of macro-regions that can eliminate the shortage or lack of electricity.
2. First of all, financial support is provided to projects based on renewable energy sources as more efficient.
3. When choosing projects for financing, the environmental factor-the degree of their environmental safety-is taken into account.
4. Projects that have received the maximum number of points on the basis of expert assessments according to the criteria established by the normative acts of the Bank in accordance with the current methodology are selected for financing.
5. After making a decision on financing suitable PPP energy project, institutions of World Bank usually carry out its subsequent maintenance including operation. It is determined by a number of reasons including lack of specialists of sufficient qualification in the regions where the projects are realized, insufficient quality of the projects submitted, lack of experience in realization of projects in this area, geopolitical and other risks of their realization.
6. Despite many successfully realized PPP projects in energetics all over the world, it cannot be called "win-win strategy" since in a long run even some of successful projects turned out to be non-remunerative.

Consequently, the state, creating conditions and providing certain guarantees, initiates investments for the creation of certain infrastructure, and the private sector, at its own expense, provides a significant part of the financing of the project.

References

Merkel, A. 1997. The Role of Science in Sustainable Development*: The price of survival: thoughts and talks about future environmental policy. Stuttgart: German publishing house* https://doi.org/10.1126/science.281.5375.336

Analysis of voluntary national reviews related to sustainable development.2018. *Ensuring access to affordable, reliable, sustainable and modern energy for all. Published by the United Nations pp. 7-8:* https://sustainabledevelopment.un.org/content/documents/21159DESASDG7_VNR_Analysis2018_final.pdf

Agarchand, N., Laishram, B. 2017. Sustainable infrastructure development challenges through PPP procurement process: Indian perspective. *International Journal of Managing Projects in Business*, 10(3) https://doi.org/10.1108/IJMPB-10-2016-0078

Romero, M.J. 2015. What lies beneath? A critical assessment of PPPs and their impact on sustainable development/: Data collection closed on 30 April 2015. https://eurodad.org/files/pdf/55deebe30f047.pdf

Chotia, V., Rao, N. V. M. 2018. Infrastructure financing and economic growth in India: an Imperial *investment. Journal of Financial Management of Property and Construction*, 23(3), 258-273: https://doi.org/10.4172/2375-4389.1000169

Colombo, E., Mattarolo, L. 2017. Energy and development: the role of academia in education, research, and technological cooperation for sustainability. *WIREs Energy Environment*, 6 https://doi.org/10.1002/wene.215

Daniel, Z., Craig, D., Schaich, L., Morgan, S.2019. Driving a public-private green energy partnership: How the Maxson WWTP biogas project fuels the new 1-gigawatt combined cycle power. *91st Annual Water Environment Federation Technical Exhibition and Conference, WEFTEC 2018*. pp. 4078-4089: https://doi.org/10,2175/193864718825135919

Delmon, J. 2010. Public-Private Partnership in Infrastructure *Practical Guide for Governmental Authorities*, Astana: IC "Orange. 165 pp.5

Dudin, M.N., Frolova, E.E., Protopopova, O.V., Andrey Alievich Mamedov, A.A., Odintsov, S.V. 2019. Study of innovative technologies in the energy industry: nontraditional and renewable energy sources. *Entrepreneurship and Sustainability Issues*, 6(4), 1704-1713. http://doi.org/10.9770/jesi.2019.6.4(11)

Expo 2017. Specialized exposition. International Recognized Exhibition: Future's Energy. Astana. Kazakhstan: URLhttps://expo2017astana.com/

Earth summit.1992. Documents from the United Nations Conference on Environment and Development (also known as UNCED or the Earth Summit) *Archived 19 January 2012 at the Wayback Machine held in Rio de Janeiro*, Brazil, 1992.

Ebhota, W. S., Inambao, F. L. 2017. Facilitating greater energy access in rural and remote areas of sub-Saharan Africa: Small hydropower. *Energy and Environment* 28(3), pp. 316-329: https://doi.org/10.1177/0958305X16686448

Evaluating the environment for public private partnerships in Asia-Pacific. 2014. The Infrascope. *A report by The Economist Intelligence Unit 2015 The Economist Intelligence Unit Ltd.,* and Asian Development Bank. https://www.adb.org/sites/default/files/publication/158409/2014-infrascope.pdf

Izmalkova S. A., Golovina T. A., Faustova I. L., Tronina I. A., Yeletsky S. S. 2012. Infrastructure project management: *textbook for higher education*. Orel: FGBOU VPO "state University of UNPK". 171 p. p. 26

Investmentsin IDA Countries Private Participation in Infrastructure (PPI) 2013 – 2017. *Private Participation in Infrastructure Database*. http://ppi.worldbank.org/~/media/GIAWB/PPI/Documents/Global-Notes/PPI_IDACountries_2013-2017

Investments in IDA Countries Private Participation in Infrastructure (PPI) 2013–2017 http://ppi.worldbank.org/~/media/GIAWB/PPI/Documents/Global-Notes/PPI_IDACountries_2013-2017

Kwame A.2011. The Potential for Public Private Partnership (PPP) in Ethiopia: Asubonteng Consultant in Capacity Building and Public Private Partnership Planning and Implementation Private Sector Development Hub/*Addis Ababa Chamber of Commerce and Sectoral Associations*: http://ethiopianchamber.com/Data/Sites/1/psd-hub-publications/the-potential-for-public-private-partnership-(ppp)-in-ethiopia.pdf

Luo, Z., Yang, K., Cen, K., He, J., Han, T. 2018. A study on the application of public-private partnership mode in shale gas development industry in China. .*Journal of Renewable and Sustainable Energy*, 10(4), 045902: https://doi.org/10.1063/1.4985945

Masood, O., Tvaronavičienė, M., Javaria, K. 2019. Impact of oil prices on stock return: evidence from G7 countries. *Insights into Regional Development*, 1(2), 129-137. https://doi.org/10.9770/ird.2019.1.2(4)

Ogundari, I. O., Otuyemi, F. A. 2009. Project planning and monitoring analysis for sustainable environment and power infrastructure project development in Lagos State, Nigeria. *International Journal of Critical infrastructure*, 15(1), 24-45. http://www.inderscience.com/link.php?id=96566

Smaliukienė, R., Monni, S. 2019. A step-by-step approach to social marketing in energy transition. *Insights into Regional Development*, 1(1), 19-32. https://doi.org/10.9770/ird.2019.1.1(2)

National Center for PPP. 2019. *Annual report* http://pppcenter.ru/analitika/

National Research Council. 1995. *The Role of Technology in Environmentally Sustainable Development*. *A Declaration of the Council of Academies of Engineering and Technological Sciences. CAETS.* Kiruna, Sweden Washington, DC: The National Academies Press. (pp.7-8) https://doi.org/10.17226/9236

Project initiatives support programme. 2019. PPP Development Center. *Annual report* http://www.pppi.ru

Private Participation in Infrastructure (PPI). 2018. *The Word Bank: IBRD-IDA: PPI Database, World Bank, as of April 2018:* http://ppi.worldbank.org/~/media/GIAWB/PPI/Documents/Global-Notes/H12018_PPI_Report

Procuring Infrastructure: Public-Private Partnerships Report: 2018. *Assessing Government Capability to Prepare, Procure, and Manage PPP* (p.218-224) https://ppp.worldbank.org/public-privatepartnership/sites/ppp.worldbank.org/ files/documents/ Procuring_Infrastructure_PPPs_2018_EN.pdf

Risk Allocation in Public-Private Partnerships: Maximizing value for Money Acknowledgements. 2015. *International Institute for Sustainable Development* https://www.iisd.org/sites/default/files/publications/risk-allocation-ppp-maximizing-value-for-money-discussion-paper.pdf

Rosinfra. Infrastructure project support platform. 2019. *Annual report* http://www.pppi.ru

Sarma, U., Karnitis, G., Zuters, J., Karnitis, E. 2019. District heating networks: enhancement of the efficiency. *Insights into Regional Development*, 1(3), 200-213. https://doi.org/10.9770/ird.2019.1.3(2)

The Role of Technology in Environmentally Sustainable Development. 1995. A Declaration of the Council of Academies of Engineering and Technological Sciences. CAETS. Kiruna, Sweden.

Tsurkan, M., Andreeva, S., Lyubarskaya, M., Chekalin, V., Lapushinskaya, G. 2017. Organizational and financial mechanisms for implementation of the projects in the field of increasing the energy efficiency of the regional economy. Open access: *Problems and Perspectives in Management*, 15(3), 453-466 http://dx.doi.org/10.21511/ppm.15(3-2).2017.13

Tvaronavičienė, M., Nesterova, K., Kováčik, V. 2017. Energy security and long-term energy efficiency: case of selected counties. *Journal of Security and Sustainability Issues*, 7(2), 349-357. https://doi.org/10.9770/jssi.2017.7.2(14)

Tvaronavičienė, M., Prakapienė, D., Garškaitė-Milvydienė, K., Prakapas, R., Nawrot, Ł. 2018. Energy Efficiency in the Long-Run in the Selected European Countries. *Economics and Sociology*, 11(1), 245-254. https://doi.org/10.14254/2071- 789X.2018/11-1/16

World Bank study: countries need to improve the quality of pre-project preparation 2018: URL http://www.pppi.ru/news/v-mire-issledovanie-vsemirnogo-banka-o-predproektnoy-podgotovke-zakonoproekt-o-gchp-v-tailande

Xu, Y., Chang, W. 2017. Analysis and countermeasures of PPP project implementation difficulties. *Open access: MATEC Web of Conferences Global Congress on Manufacturing and Management (GCMM 2016)* https://doi.org/10.1051/matecconf/201710005039

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SUSTAINABLE PROJECT MANAGEMENT FOR MULTI-AGENT DEVELOPMENT OF ENTERPRISE INFORMATION SYSTEMS*

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Abstract. The paper includes a review of processes in managerial decision-making based on results of multi-agent simulation in development of enterprise information systems. Authors have proposed the multi-agent model, within which agents' actions depend on a hybrid function of preferences. On this basis, authors have formalized the method, with which it is possible to evaluate agents' judgments. The method combines qualitative, quantitative and fuzzy approaches provide by the decision-making theory and the idea of the criteria space divided into sectors. The synthesis of these approaches has made it possible to lower subjective uncertainty inherent in shared managerial decision making. For the multi-agent model, they have drafted event processing algorithms and identified criteria to evaluate simulation results necessary to support decision making in order to identify the most effective option in development of enterprise information system. Authors have also introduced a methodology-related toolkit in the form of software, including the multi-agent model, decision system and optimization module.

Keywords: multi-agent simulation; enterprise information systems; hybrid function of preferences; web-based decision support services

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1. Introduction

Information and telecommunication technologies have recently become one of the most crucial factors in enterprise development. Information systems for enterprise resource and product life cycle management are facing their active transformation into a global strategy (Hess, Matt, Benlian, & Wiesböck, 2016; Kuzmin, 2017), where integrated automation of all the business processes (Shi & Wang, 2018) is getting more and more in demand.

Application of the potential of information technology in enterprise modernization goes hand in hand with a number of the contradictions that we need to overcome. The main contradiction is that existing function-aimed organizational structures of enterprises do not always suite efficient decision making on introduction of new information technology in the field of design. This is due to a number of closely interrelated factors. This is also an important research objective, solvable, from our point of view, with the shared methodological framework in place that includes decision-making systems based on multi-agent and simulation modelling (Batkovskiy, Konovalova, Semenova, Trofimets, & Fomina, 2015). For this reason, it is of immediate interest to establish management of designing, development and introduction of the systems that use integration mechanisms. Such management has to ensure building of a shared information space.

Therefore, a research purpose is development of methods that support decision-making, as well as development of the multi-agent model and a number of the statistical criteria for simulation, which contribute into such the distribution of tasks between performers that ensures the highest economic efficiency in building of enterprise information systems.

2. Literature Review

Introduction of an information system aims at higher performance of production facilities (Belás, Bartoš, Ključnikov, and Doležal, 2015), as well as supporting of managerial decision-making under conditions of uncertainty and risk (Mohammad, 2015). There are several reasons for this. Note that well-time, accurate and complete managerial data are factors that provide for production efficiency (Batkovskiy, Kalachikhin, Semenova, Telnov, and Fomina, 2016b), while sustainable production scheduling and its monitoring might be achieved with an efficient enterprise information system (Gontarz, Hampl, Weiss, and Wegener, 2015). A current situation brings up to date development of the all-inclusive integrated information systems that provide for necessary managerial functions (Mamary, Shamsuddin, and Aziati, 2014).

For the abovementioned reasons, some methodological aspects in development of information systems and issues of ensured efficient project management in IT system development have not yet been elaborated to a required level and have been intensively discussed (Batkovskiy, Kalachikhin, Semenova, Telnov, and Fomina, 2016a).

Main strategies and approaches to building of large-scale information systems have been developed for a long time (Marcinkowski & Gawin, 2016) to meet ever-changing market needs. For instance, cloud technologies (Nguyen & Luc, 2018), sensors and intelligent control systems (Vlasov, Grigoriev, Krivoshein, Shakhnov, Filin, & Migalin, 2018; Vlasov, Echeistov, Krivoshein, Shakhnov, Filin, & Migalin, 2018) are of particular importance now. Over the past few decades, many product lifecycle models and group development methodologies have been developed to improve a quality of the software being developed (Mihaela Dima & Maassen, 2018; Tavares,

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2016). To assess success and quality aspects of the information systems being developed, there are sets of metrics and indicators (Delone & McLean, 2016).

Many researchers pay attention to development management in case of changed functional requirements to a software product. See the model for evaluation of such cases in Shah, Kama, and Bakar, 2018. See a detailed analysis of problems (incorrect prioritization of tasks, errors in a source code, and incompliance with functional requirements) in Sun, Ni, Lam and Ng (2016), as well as in Lehtinen, Mäntylä, Vanhanen, Itkonen, and Lassenius, 2014.

Simulation of decision support and analysis of processes has found its applications in many areas of research and in practiced-based solutions (Zulkosky, White, Price, and Pretz, 2016; Marzouk & Mohamed, 2019; Schubert, Moradi, Asadi, Luotsinen, Sjöberg, Hörling, Linderhed, and Oskarsson, 2015; Güçdemir & Selim, 2018).

Multi-agent simulation, chosen as one of the main tools in this research, has found its applications in various domains. For instance, for development of network topologies (Kamiyama, 2016), consciousness (Arsene & Dumitrache, 2017) and transportation-related tasks (Mastio, Zargayouna, Scemama, and Rana, 2018). The second most important tool applied in this research is the decision support system. For instance, in management of corporations (Chen, Yen, Lin, and Chou, 2018), when people decide on location of production facilities (Kuzmin, 2018) or a reasonable configuration of the product being designed (Buchert, Ko, Graf, Vollmer, Alkhayat, Brandenburg, Stark, Klocke, Leistner, and Schleifenbaum, 2019). Object ranking methods have been also in wide use and have faced their development (Asadabadi, 2018; Safarzadeh, Khansefid, and Rasti-Barzoki, 2018). We are aware of the attempts to describe a development process of enterprise information systems with the help of the multi-agent model. However, specifics of its application does not make it possible to have full and comprehensive review of the problem of large-scale project management, where projects assume development of information systems.

3. Materials and methods

3.1 Simulation formalization of EIS development

In this research, the methodological framework for applications of decision-making support models have found their further development with regard to tasks of planning and management in the development and introduction of enterprise information systems.

There are the following components in the development process model (DM):

a) Tasks for development of the modules that an enterprise information system includes, for which there is a need in a research at a pre-design stage.
b) Alternatives are options of EIS development. They all find their representation in the form of a relevant model with a specific set of parameters (for instance, distribution of powers at stages of design and development) and, possibly, unique structure. The models are ranked to help decision makers to choose a rational scenario for EIS development.
c) Parameters of the simulation model and criteria for evaluation of simulation results are main criteria for ranking of alternatives.

To state the problem in a formal way, let us introduce the following denotations.

$$T = \{T_1, T_2, \ldots, T_i, \ldots, T_n\}, i = \overline{1,n}, \quad (1)$$

where T is an array of assignments (orders for EIS development).

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For each assignment, there is a finite sub-array of alternatives shown with models A_i:

$$A_i = \{\alpha_{i1}, \alpha_{i2}, \ldots, \alpha_{ij}, \ldots, \alpha_{im}\}, i = \overline{1,n};\ j = \overline{1,m}, \quad (2)$$

where $\alpha_{i,j}$ is the j-th alternative for the i-the assignment;

$$M = \{M_1, M_2, \ldots, M_i, \ldots, M_n\}, i = \overline{1,n} \quad (3)$$

M is an array of options of the models compared with each sub-array of alternatives in such a way as each set of alternatives A_i has array of models M_i, where:

$$M_i = \{\mu_1(\Lambda_1, \Xi_1), \mu_2(\Lambda_2, \Xi_2), \ldots, \mu_j(\Lambda_j, \Xi_j), \ldots, \mu_m(\Lambda_m, \Xi_m)\}, i = \overline{1,n};\ j = \overline{1,m}\ , \quad (4)$$

where μ_j is a specific implementation of a model, while

$$\begin{aligned} \Lambda_j &= \{\lambda_1, \lambda_2, \ldots, \lambda_l, \ldots, \lambda_{k_j}\}, l = \overline{1,k_j};\ j = \overline{1,m} \\ \Xi_j &= \{\xi_1, \xi_2, \ldots, \xi_s, \ldots, \xi_{v_j}\}, l = \overline{1,v_j};\ j = \overline{1,m} \end{aligned}, \quad (5)$$

where Λ_j is an array of input data – model parameters, while Ξ_j is a vector of criteria for the evaluation of simulation results.

The above-mentioned assumes that there is a need in introduction of the algorithm that establishes correlation between objects T, A, M, L, Ξ:

$$\forall T_i \exists A_i : \forall \alpha_{i,j} (\alpha_{i,j} \in A_i) \exists \mu_j (\Lambda_j, \Xi_j) [\mu_j \in M_i], i = \overline{1,n};\ j = \overline{1,m} \quad (6)$$

There is a separated review of model optimization (rationalization). This process refers to a selection of the most favourable vector for model parameters. In this case, there is an aim to achieve the indicators that a user wants for EIS development process. Let us introduce the following denotations:

n is dimensionality of the model parameters' vector;

m is dimensionality of the vector of evaluation criteria for simulation results;

$X = \{x_1, x_2, \ldots x_i, \ldots x_n\}, i = \overline{1,n}$ is a set of parameters for a model;

$Y = \{y_1, y_2, \ldots y_j, \ldots y_m\}, j = \overline{1,m}$ is a vector of evaluation criteria for simulation results;

$A = \{a_1, a_2, \ldots a_i, \ldots a_n\}, i = \overline{1,n}$, where a_i is a down-top constraint by amount of available resources in EIS development;

$B = \{b_1, b_2, \ldots b_i, \ldots b_n\}, i = \overline{1,n}$, where b_i is a top-down constraint by amount of available resources in EIS development.

With the denotations introduced, the formal record of the task has one of the following forms depending on user's preferences:

$$\begin{aligned} &\max_X \{y_j = f(X)\} \\ &\min_X \{y_j = f(X)\} \end{aligned} \quad (7)$$

In Equation (7), $f(X)$ refers to a transformation of the vector of parameters into one of criteria y_j to evaluate simulation results and chosen by a user as a target function. Given the resource constraints:

$$\begin{aligned} x_i &\le b_i, (i = \overline{1,n}) \\ x_i &\ge a_i, (i = \overline{1,n}) \end{aligned} \quad (8)$$

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Note that almost in each tasks related to CIS development, $m > 1$. That is, the optimization problem belongs to the class of multi-criteria problems. To work with this class of engineering challenges, we applied the hybrid method for preference identification. With this scenario, it is possible to use quantitative ranking methods for the alternatives that fall in the same area (Spina, 2016).

When people build, upgrade and introduce IESs, it is necessary to provide a project manager with probabilistic and temporal performance metrics for the personnel involved in parametric and structural changes in software development. This is necessary for taking necessary measures and making influence performers (Sudhaman & Thangavel, 2015).

To debug and explore a chance of an application of the considered approach, authors built the development model (DM) for an enterprise information system. Taking into account the accepted assumptions, there are the following stages in a flow of applications in development of the enterprise information system (Fig. 1).

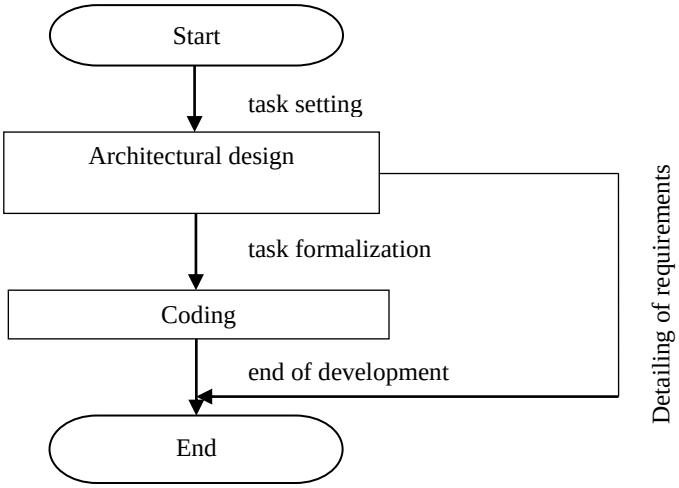

Fig. 1. Diagram of interconnected stages in the software development simplified cycle

DM is based on simplified development of software. There are the following events in the model considered in enterprise information system development: (1) application enters the system, (2) application processing at the *Architecture* stage, (3) application processing at the *Development* stage. See the relationship of the abovementioned model events in Fig. 2.

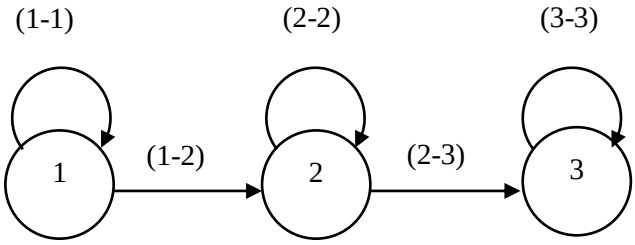

Fig. 2. Model event graph

Each transition on the model event graph triggers scheduling of a model event. It is enough to have such a relatively simple model for development for a further test and debugging of an approach, as well as substantiating of its possible use in more complex tasks of IES development with the multi-agent models applied.

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3.2. Multi-agent model for development of enterprise information system

To achieve high performance of employees when they build, update, apply and maintain the information system (Wanderley, Menezes, Gusmão, & Lima, 2015), (Choudhary, Kumar, Kumar, Mishra, & Catal, 2018), based on the abovementioned approach, the authors developed the multi-agent model of the development process (DM).

It is assumed that in the model under consideration, agents have preference functions and they are guided by such functions. It is assumed that the agent's preference function (that belongs to class *Problem Owner [PO]*) is without changes. For the tasks that allow the optimization of a structure, it is possible to set functions of the agents that belong to class *Object* (O), for the other tasks, *O* function stays unchanged. The preference function for an agent that belongs to class *Subject (C)* has two parts: it includes one's own interests that are assumed unchanged, and the interests affected by *PO*. In its last part, the preference function is adjustable. Virtual agents (*VAs*) are, as a rule, made with such the system of preferences as to provide a search for a global optimum. Agent's preferences are often imprecise and unclear. Besides, estimated judgments of agents by criteria can often be obtained with a certain error, which is reasonable to be taken into account. To use fuzzy judgments in the model, it is necessary to apply the apparatus from the theory of fuzzy sets. See the diagram that describes a subject area and task transitions between agents in Fig. 3

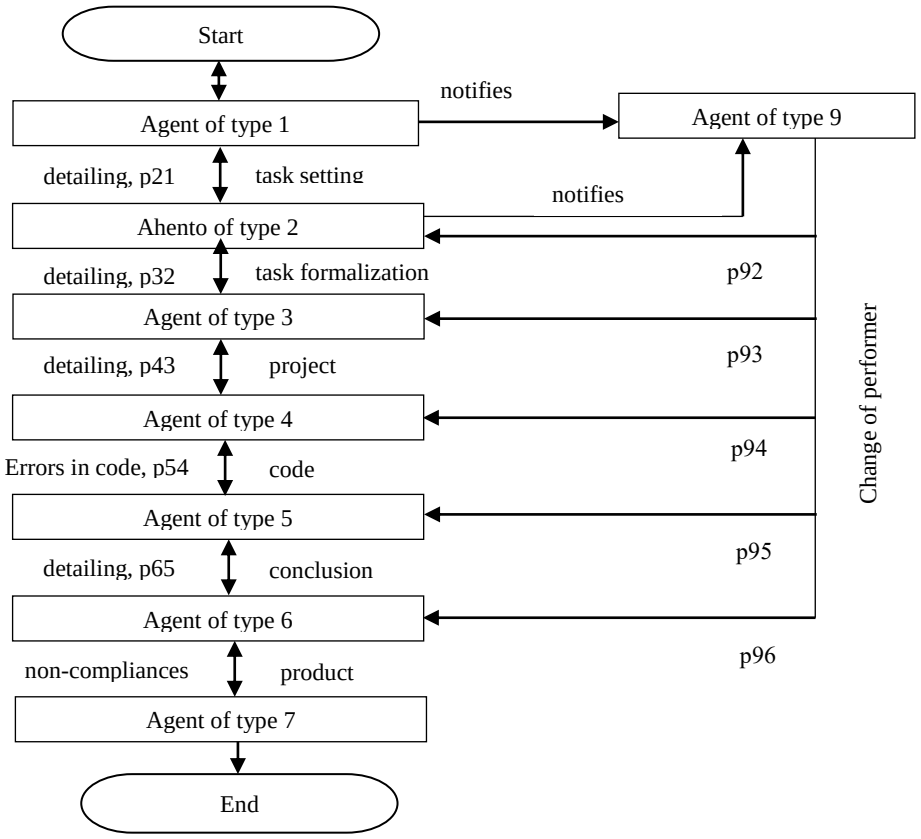

Fig. 3. Application flow chart in the multi-agent model for development of enterprise information system

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Tasks to change the EIS arise in communication between agents of type 1 and type 2. After this, a task is successively transferred by agents of type 2 to agents of type 3 and so forth. With certain non-zero probability (p21, p32, p43, p54, p65, p76), it can return to agents at any of the previous stages. The information model of inter-agent interaction looks like a backboard.

Agents independently choose tasks, based on their own preference function, while others are forcedly assigned to performers by the agent of type 9 based on his/her preference function. Furthermore, the agent of type 9 may block a possibility of independent allocation of tasks between some other agents of types 2-6. Any of the abovementioned operations might happen with certain probabilities (p92, p93, p94, p95, p96).

It is possible to present a choice of the most suitable ('profit-bearing') employee as a process (to solve a task) in the following formal way:

$$I = \min_i arg \left\{ \max_i \left(S_{ijn} KS_{kn} + \left(1 - L_{in}(t)\right) KL_{kn} \right) \right\}, \tag{9}$$

where i is a unique identifier of a software developer; j is a unique identifier of a type of an application; k is a unique priority identifier; n is a number of a service stage; $S_{i,j,n}$ is experience of a developer with identifier i to perform tasks with identifier j at stage number n; $L_{i,n}(t)$ is a load of a developer with identifier i at moment of time t at stage number n; $KS_{k,n}$ is a weight contributed by experience of an employee for a case of an application with k priority at stage number n; $KL_{k,n}$ is a weight contributed be the load of the employee for the case of an application with k priority at stage number n.

4. Results

4.1. Software for application of the multi-agent model

The most important result from the research is the developed multi-agent model, in which people apply the considered simulation algorithms. See the diagram of classes within the developed model in Fig. 4.

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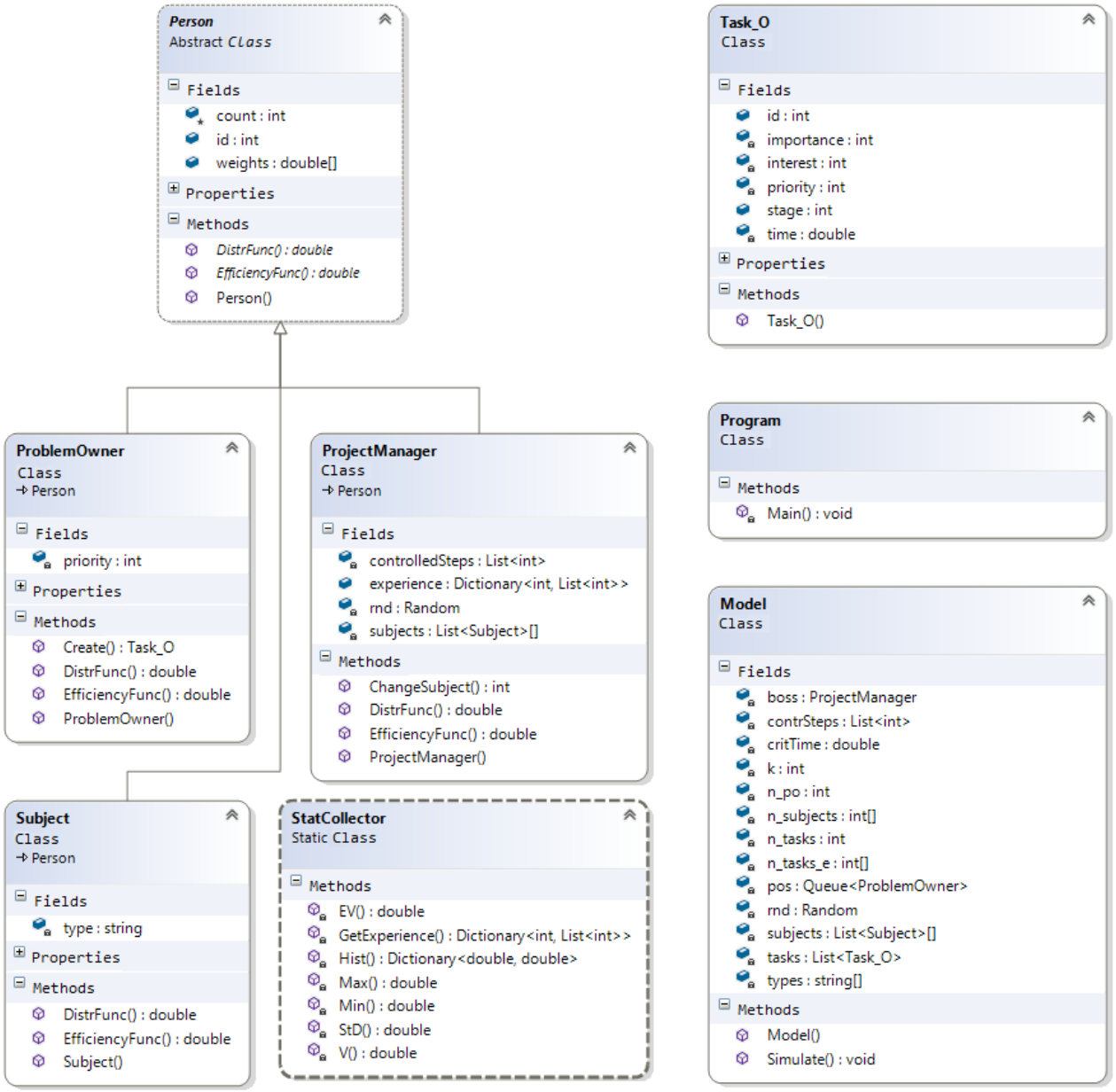

Fig. 4. Diagram of classes in the multi-agent model for enterprise information system development

The *ProblemOwner* class performs functions of the *VP*-type agent. It is possible here to set tasks using the Create method, perform the distribution function with regard to a number of tasks and preference function, *DistrFunc* and *EfficiencyFunc*, respectively. The *ProjectManager* class makes it possible to implement functions of the 9-type agent. It has its own preference function regarding a choice of a performer for a task (Equation 9) - *EfficiencyFunc*, and the method that makes it possible to change performers of tasks - *ChangeSubject*. The *Subject* class describes all the other *C*-type agents considered within the model. The *Task_O* class describes the O object, i.e. the task that is to be solved. The *StatCollector* class is auxiliary used to gather statistics when the model is in operation. The *Model* class provides a description of model parameters, as well as methods, with

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which we apply the simulation algorithm. The described multi-agent model was made using *C#* in *MS Visual Studio*.

4.2. Software to apply the hybrid method of preference identification

There is the open access module at ws-dss.com for cloud computing. It contains the developed function that makes it possible to apply the hybrid method of preference identification (Fig. 5).

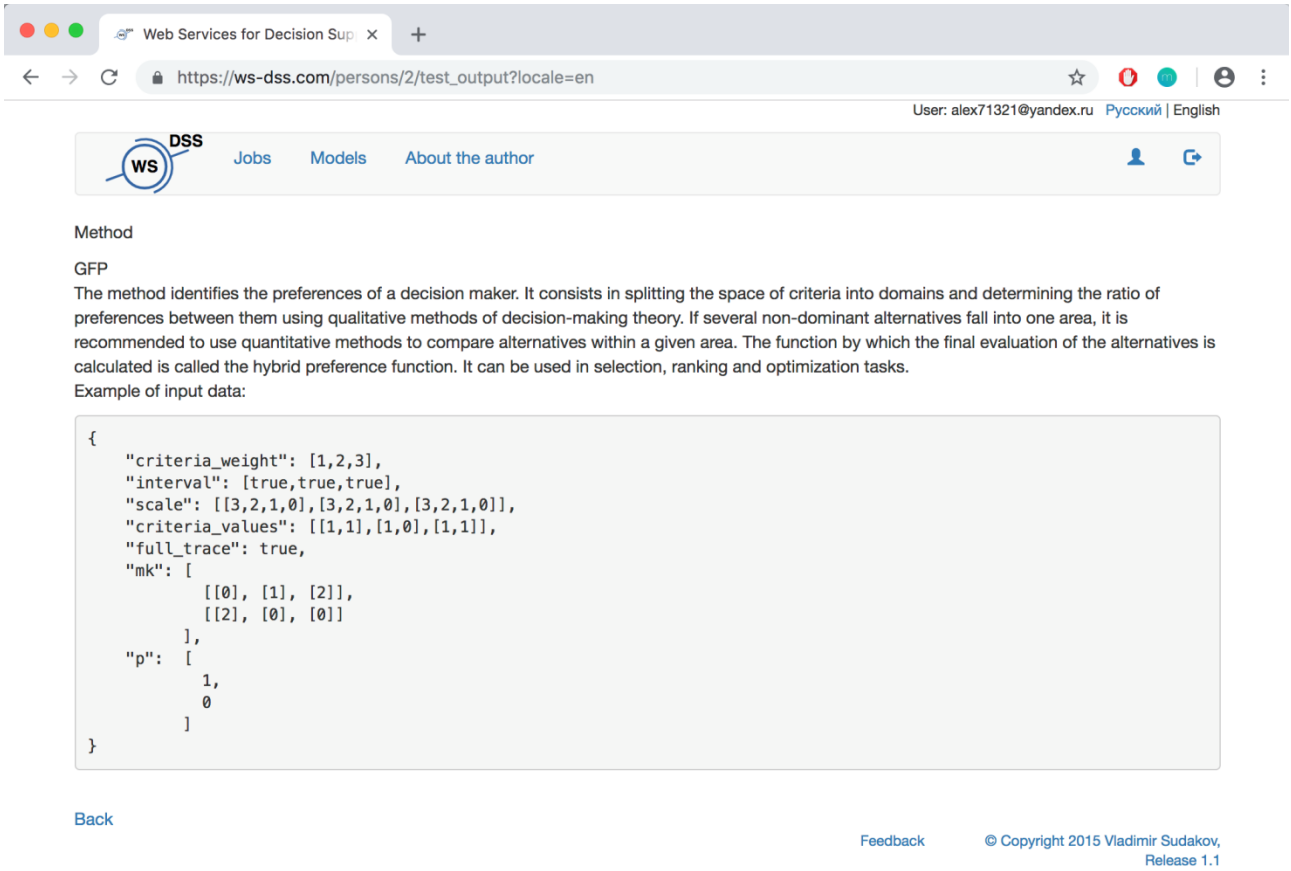

Fig. 5. Hybrid preference function call interface

The authors has developed the system using open source software, which is a positive aspect (Paschali, Ampatzoglou, Bibi, Chatzigeorgiou, & Stamelos, 2017; Olson, Johansson, & De Carvalho, 2018). Modules of WS-DSS decision support system, as well as in the domain model, are independent agents. Thus, there is no single framework in the system. Agents interact using an exchange of messages. The described and introduced approach using agents independent of each other results in almost no communication between modules. This significantly reduces labour costs for changes in the system and significantly improves its performance (Yatsalo, Didenko, Gritsyuk, & Sullivan, 2015; Rodríguez-Padial, Marín, & Domingo, 2015).

In its development, authors considered that the enterprise information system is to cover all the aspects in the enterprise's life (procurement, production, sales, personnel management, etc.). In the overwhelming majority of cases, each relevant aspect has an assigned employee in charge, who assigns tasks based on his/her distribution function and preference. Besides, the model takes into account the factor of interaction in a team shown by chains of transfers and returns of tasks between performers, as well as the ability of agents to choose tasks by their own

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preference functions. All the above mentioned suggest that the proposed multi-agent model adequately and fully describes actual development and introduction of enterprise information systems.

Conclusion

In the research, authors developed the algorithmic decision-making support based on multi-agent simulation. They also piloted the heuristic method intended for rationalization of the parameters that the model has. An advantage of the developed multi-agent model compared to the models referred to by similar research, lies in high level of details in the process of information system building (task setting, requirement review, development, introduction, etc.) with due regard to personal preferences. Authors offered the hybrid method, with which it is possible to identify preferences for a multi-criteria analysis of options for the multi-agent model of the development process. It covers the expert's overall system of values in terms of high-dimensional criteria, including both qualitative, and quantitative components. Developed software includes independent services that interact with each other using network data transfer protocols, which makes it easy to adjust and enhance the model to meet changing needs. Integration of methods for decision support and multi-agent simulation within a shared system framework provides the synergistic effect in management of building and introduction of enterprise information systems.

References

Arsene, O. and Dumitrache, I. (2017). Mind as multi-resolution system based on multi-agent architecture. *Biologically Inspired Cognitive Architectures, 20*, 31-38. https://doi.org/10.1016/j.bica.2017.02.003

Asadabadi, M.R. (2018). The stratified multi-criteria decision-making method. *Knowledge-Based Systems, 162*, 115-23. https://doi.org/10.1016/j.knosys.2018.07.002

Batkovskiy, A.M., Kalachikhin, P.A., Semenova, E.G., Telnov, Yu.F., and Fomina, A.V. (2016a). Component methodology for creating and implementing organizational innovations in business companies. *Indian Journal of Science and Technology, 9*(27), 121-34. http://doi.org/10.17485/ijst/2016/v9i27/97658

Batkovskiy, A.M., Kalachikhin, P.A., Semenova, E.G., Telnov, Yu.F., and Fomina, A.V. (2016b). Economic-mathematical model and mathematical methods for substantiating the choice of the company innovation strategy. *Indian Journal of Science and Technology, 9*(27), 99-111. http://doi.org/10.17485/ijst/2016/v9i27/97662

Batkovskiy, A.M., Konovalova, A.V., Semenova, E.G., Trofimets, V.Ya., AND Fomina, A.V. (2015). Study of economic systems using the simulation-based statistical modelling method. *Mediterranean Journal of Social Sciences, 6(4),* 369-80. http://doi.org/10.5901/mjss.2015.v6n4s4p369

Belás, J., Bartoš, P., Ključnikov, A., and Doležal, J. (2015). Risk perception differences between micro-, small and medium enterprises. *Journal of International Studies, 8,* 20-30.

Buchert, T., Ko, N., Graf, R., Vollmer, T., Alkhayat, M., Brandenburg, E., Stark, R., Klocke, F., Leistner, P., and Schleifenbaum, J.H. (2019). Increasing resource efficiency with an engineering decision support system for comparison of product design variants. *Journal of Cleaner Production, 210,* 1051-62. https://doi.org/10.1016/j.jclepro.2018.11.104

Chen, P.S., Yen, D.C., Lin, S.C., and Chou, C.S. (2018). Toward an IT investment decision support model for global enterprises. *Computer Standards & Interfaces, 59,* 130-40. https://doi.org/10.1016/j.csi.2018.04.001

Choudhary, G.R., Kumar, S., Kumar, K., Mishra, A., and Catal, C. (2018). Empirical analysis of change metrics for software fault prediction. *Computers & Electrical Engineering, 67,* 15-24. http://doi.org/10.1016/j.compeleceng.2018.02.043

Delone, W., McLean, E. (2016). Information systems success measurement. *Foundations and Trends in Information Systems, 2,* 1-116. http://doi.org/10.1561/2900000005

Gontarz, A.M., Hampl, D., Weiss, L., and Wegener, K. (2015). Resource consumption monitoring in manufacturing environments. *Procedia CIRP, 26,* 264-69. http://doi.org/10.1016/j.procir.2014.07.098

Güçdemir, H., Selim, H. (2018). Integrating simulation modelling and multi criteria decision making for customer focused scheduling in job shops. *Simulation Modelling Practice and Theory, 88,* 17-31. http://doi.org/10.1016/j.simpat.2018.08.001

Hess, T., Matt, C., Benlian, A., and Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive, 15,* 123-39.

Kamiyama, N. (2016). Generating desirable network topologies using multi-agent system. *Computer Communications,76,* 87-100. https://doi.org/10.1016/j.comcom.2012.07.019

Kuzmin, E.A. (2017), Risk and uncertainty in concept of corporate lifecycle. *Problems and Perspectives in Management, 15*(1), 107-114. https://doi.org/10.21511/ppm.15(1).2017.11

Kuzmin, E.A., and Dubrovsky, V. Zh. (2018). Estimation method of favor level of external business conditions during projects implementation. In *Proceedings of International Conference on Research Paradigms Transformation in Social Sciences RPTSS* (pp. 262-82). https://dx.doi.org/10.15405/epsbs.2018.12.83

Lehtinen, T.O.A., Mäntylä, M.V., Vanhanen, J., Itkonen, J., and Lassenius, C. (2014). Perceived causes of software project failures – an analysis of their relationships. *Information and Software Technology, 56*(6), 2014, 623-43. https://doi.org/10.1016/j.infsof.2014.01.015

Mamary, Y.H.S., Shamsuddin, A., and Aziati, A. (2014). The Role of different types of information systems in business organizations: a review. *International Journal of Research, 1,* 1279-86.

Marcinkowski, B., Gawin, B. (2016). Project management in international IT ventures - does the practice go hand in hand with theory? *Conference Proceedings Information Systems: Development, Research, Applications, Education, 264,* 144-152. http://doi.org/10.1007/978-3-319-46642-2_10

Marzouk, M., Mohamed, B. (2019). Integrated agent-based simulation and multi-criteria decision making approach for buildings evacuation evaluation. *Safety Science, 112,* 57-65. http://doi.org/10.1016/j.ssci.2018.10.010

Mastio, M., Zargayouna, M., Scemama, G., and Rana, O. (2018). Two distribution methods for multiagent traffic simulations. *Simulation Modelling Practice and Theory, 89,* 35-47. https://doi.org/10.1016/j.simpat.2018.09.005

Mihaela Dima, A., Maassen, M.A. (2018). From waterfall to agile software: development models in the IT sector, 2006 to 2018. Impacts on company management. *Journal of International Studies, 11,* 315-326. https://doi.org/10.14254/2071-8330.2018/11-2/21

Mohammad D. (2015). Exploring the use of an Information visualization tool for decision support under uncertainty and risk. In *Proceedings of the International Conference on Engineering MIS 2015 (ICEMIS '15).* New York, NY, USA: ACM. http://doi.org/10.1145/2832987.2833050

Nguyen, T.D., V.T. Luc, K. (2018). Information systems success: empirical evidence on cloud-based ERP. *Lecture Notes in Computer Science, 11251,* 471-485. http://doi.org/10.1007/978-3-030-03192-3_3

Olson, D.L., Johansson, B., and De Carvalho, R.A. (2018). Open source ERP business model framework. *Robotics and Computer-Integrated Manufacturing, 50,* 30-36. http://doi.org/10.1016/j.rcim.2015.09.007

Paschali, M.E., Ampatzoglou, A., Bibi, S., Chatzigeorgiou, A., and Stamelos, I. (2017). Reusability of open source software across domains: a case study. *Journal of Systems and Software, 134.* 211-227. http://doi.org/10.1016/j.jss.2017.09.009

Rodríguez-Padial, N., Marín, M., and Domingo, R. (2015). Strategic framework to maintenance decision support systems. *Procedia Engineering, 132*, 903-910. https://doi.org/10.1016/j.proeng.2015.12.576

Safarzadeh, S., Khansefid, S., and Rasti-Barzoki, M. (2018). A group multi-criteria decision-making based on best-worst method. *Computers & Industrial Engineering, 126*, 111-121. https://doi.org/10.1016/j.cie.2018.09.011

Schubert, J., Moradi, F., Asadi, H., Luotsinen, L., Sjöberg, E., Hörling, P., Linderhed, A., and Oskarsson, D. (2015). Simulation-based decision support for evaluating operational plans. *Operations Research Perspectives, 2*, 36-56. http://doi.org/10.1016/j.orp.2015.02.002

Shah, J., Kama, N., Bakar N.A. (2018). A novel effort estimation model for software requirement changes during software development phase. *International Journal of Software Engineering & Applications (IJSEA), 9*(6), 11-30. https://doi.org/10.5121/ijsea.2018.9602

Shi, Z., Wang, G. (2018). Integration of big-data ERP and business analytics (BA). *Journal of High Technology Management Research, 29*(2), 141-150. http://doi.org/10.1016/j.hitech.2018.09.004

Spina, L.D. (2016). Evaluation decision support models: highest and best use choice. *Procedia - Social and Behavioral Sciences, 223,* 936-43. http://doi.org/10.1016/j.sbspro.2016.05.323

Sudhaman, P., Thangavel, C. (2015). Efficiency analysis of ERP projects-software quality perspective. *International Journal of Project Management, 33*(4), 961-70. https://doi.org/10.1016/j.ijproman.2014.10.011

Sun, H., Ni, W., Lam, R., and Ng, C.Y. (2016). A Stage-by-stage assessment of enterprise resource planning implementation: An empirical study from Hong Kong. *Journal of Global Information Technology Management, 19*(2), 104-27. http://doi.org/10.1080/1097198X.2016.1173387

Tavares, B. (2016). Risk management analysis in software projects which use the scrum framework. *Intl. Trans. in Op. Res. 00,* 1-22. http://doi.org/10.1111/itor.12401

Vlasov, A. I., Grigoriev, P.V, Krivoshein, A. I., Shakhnov, V. A., Filin, S. S., & Migalin, V. S. (2018). Smart management of technologies: Predictive maintenance of industrial equipment using wireless sensor networks. *Entrepreneurship and Sustainability Issues*, *6*(2), 489–502. http://doi.org/10.9770/jesi.2018.6.2(2)

Vlasov, A.I., Echeistov, V.V, Krivoshein, A.I., Shakhnov, V.A., Filin, S.S., & Migalin, V.S. (2018). An information system of predictive maintenance analytical support of industrial equipment. *Journal of Applied Engineering Science, 16*(4), 515–22. http://doi.org/10.5937/jaes16-18405

Wanderley, M., Menezes, J., Gusmão, C., and Lima, F. (2015). Proposal of risk management metrics for multiple project software development. *Procedia Computer Science, 64,* 1001-9. http://doi.org/10.1016/j.procs.2015.08.619

Yatsalo, B., Didenko, V., Gritsyuk, S., and Sullivan, T. (2015) A framework for multi-criteria decision analysis. *International Journal of Computational Intelligence Systems, 8*(3), 467-89. http://doi.org/10.1080/18756891.2015.1023586

Zulkosky, K.D., White, K.A., Price, A.L., and Pretz, J.E. (2016). Effect of simulation role on clinical decision-making accuracy. *Clinical Simulation in Nursing, 12*(3), 98-106. http://doi.org/10.1016/j.ecns.2016.01.007

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
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PROJECT TOOLS IN RELATION TO THE IMPLEMENTATION OF THE ABILITY OF INNOVATION COMPANIES IN SLOVAKIA*

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Abstract. The ability of project implementation is considered an important part of corporate reality. The current situation shows that project management is used not only in technology-oriented companies but has also found its place in other areas, mainly because of the effective implementation of the necessary corporate innovations. This article intends to analyze the use of project tools in various types of companies, including public institutions in the Slovak Republic. For the verification of the use of these tools, a random selection of 154 companies implementing projects in the Slovak Republic was used. In the research, we performed a cluster analysis and multivariate regression analysis. The results show the differential use of individual instruments not only in terms of the size of companies but also in terms of realized types of projects. The most important project management procedures are related to team communication, but also to clients and external experts. The results also show that the effective use of tools, especially in the project implementation phase and completion, significantly improves the success of projects.

Keywords: project; project tools; success project; project management

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JEL Classifications: D83, O22, M15, H430

1. Introduction

Projects and innovations are ubiquitous in our professional and private life - we live in the project company (Lundin et al., 2015) and in innovative companies (Rammert et al., 2015). Project management is undoubtedly one of the main topics within most organizations. It is increasingly used in various fields of business, but also in a

* *The paper is the output of an international scientific project IGA no. 2/2018 - M "Problems and Suggestions - Comparison of Commercial Environment between China - Slovakia and Facilitation of Trade and Investment". (Funder: VSEMvs IGA VSEMvs, i.e. School of Economics and Management in Public Administration)*

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variety of subjects from start-ups and small businesses to multinational corporations. Project management serves as a very valuable application platform primarily for the business innovation process.

One of the many questions that companies ask is: Does the organization with a higher degree of Project Management maturity achieve better project results? The answers to this are trying to bring various studies compiled by various institutions (PMI, IPMA, KPMG, EY). First, it is necessary to evaluate the real use of project management tools. As shown by a recent global survey of the use of project management is still a big part of the project does not meet its objectives (APM, 2015 PMI, 2018 Standish Group, 2018). Although the use of project tools is gradually improving (KPMG, 2017, PMI, 2018), there is still a clear gap and disproportion between use across sectors.

Projects have become a ubiquitous means of organizing work not only within the industrial enterprises (Midler, 1995) but also in the work of professional sectors, such as research, education, health, culture, sport, politics and public administration (Supeková, 2014; Petrenko, Stolyarov, 2019). The consequence of this trend is that projects spending more time and that projects from a larger value (Schoper et al., 2016). According to the surveys, which were recently implemented (PMI, 2018, Standish Group, 2015) is the application of project management in business management is increasingly used not only ICT companies. It is increasingly being used in various areas of business, regardless of size, i.e. both small and multinational. The importance of using the growing need for effective implementation of innovations. Of course, the implementation of complex innovations and changes is not only related to the actual use of project management tools, but also to the surrounding conditions that allow such changes to be made.

2. Project management

Project management is undoubtedly one of the main themes in most organizations. Project management serves as a very valuable application platform for the business innovation process. Currently, projects are very diverse and can have different goals, needs, and requirements. In addition, we find in the literature a lot of different definitions of projects. As part of our investigation, we are inclined to define from the PMBOK® Guide and the EY project definition. "The project is a temporary effort to create a unique product, service or result project" (PMI, 2017). EY defines a project as a "one-time process consisting of a set of synchronized and managed activities with a defined start and end date that is implemented to achieve the goal (taking into account time, cost and resource constraints) and that meets specific predefined requirements" (EY, 2017).

Perhaps the most popular word of each expert for the project is "success" (Howsawi, Fager, Bagi & Niebecker, 2014). There are two main concepts of success when we talk about projects: project success and successful project management. There are similarities and differences between the two dimensions of project success (De Wit, 1988, Serrador, Turner, 2015). The main difference is the linking of the project success with the result of the achievement of the goals achieved, while the success of the project management concerns traditional time, cost and quality measurements (De Wit, 1988, Jugdev, Müller, 2005, Ika, 2005). However, given the many different models for the success of both project and project management, it is difficult to distinguish strongly between them, mainly because of their interrelationships.

Much of the project does not meet its objectives (APM, 2015, PMI, 2018, Standish Group, 2018) and only 40% of project objectives are in line with the organizational strategy (PMI, 2018). This is especially true when there is increased pressure from senior management on project managers to demonstrate the benefits of the project (Lappe and Spang, 2014, Mir and Pinnington, 2014). This requires a robust Benefit Management process for active management and continuous alignment of project outputs, results, benefits and organizational strategy (Zwikael and Smyrk, 2015).

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3. Slovak innovation environment

Innovative projects in companies typically include the development of new products and new processes (Bresnen, Edelman, Newell, Scarbrough, & Swan, 2003), which are associated with opportunities for emerging new ideas and strengthening the potential of companies' innovative potential. Such projects can be seen as drivers of innovation and change, and organizations can innovate through projects (Davies & Hobday, 2005, Shenhar & Dvir, 2007). The common transformation of all innovation projects is the creation of an adequate environment that enables people to create innovative projects (Winch, 2014).

The situation in Slovakia in terms of the ability to implement innovations can be considered complicated. On the one hand, it is because, according to the European Innovation Index, Slovakia ended in 23rd place (European Commissin, 2018). This current situation means that Slovakia is the last in the creation of knowledge, innovation, and entrepreneurship, and only a slightly better rating was given to Slovakia in the group of innovative support, mainly due to the education of the young generation. Financing innovation is very problematic from the evaluation. Slovakia is heavily dependent on EU funding for research and development. This is because private sector investment in innovation is insufficient. Development financing innovation can be seen in Figure 1 below.

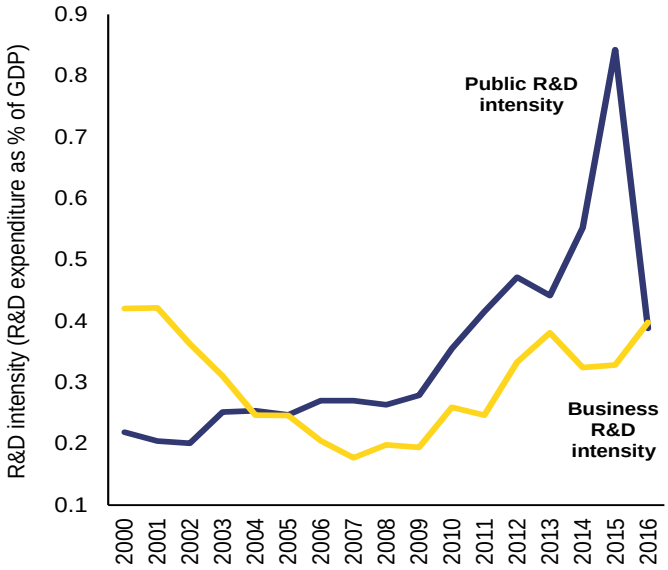

Figure 1. RDI investment by sector
Source: European Commission

Figure 1 shows a sharp decline in the public R&D financial envelope in 2016, caused by the transition between EU funding periods. This fact highlights the over-reliance of Slovak research at European structural and investment funds and raises questions about the sustainability and adequacy of national funding for research and development.

R&D spending by enterprises is very low to significantly increase innovation performance. Overall, the research and development of enterprises, one of the smallest in the EU and focuses on the production of medium to high-tech, in areas dominated by multinational companies (European Commission, 2019). Corporate spending on

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research and development by small and medium-sized enterprises, which in 2016 were at 0.14%, are to be found still significantly below the EU average. As a result, making very little progress in innovation and in accordance with European summary innovation results, Slovakia remains one of the innovators of undistinguished (European Commission, 2019). The main factors limiting innovation activities are cost factors (Benešová, Kubičková, Michálková, & Krošláková, 2018). According to the survey Statistical Office of the Slovak Republic (ŠÚRS, 2019), considers the lack of financial resources within the company as an innovative barrier highest 29% of enterprises, the prohibitive costs of innovation 25.9% and the shortage of funds on loans, 10.2% of enterprises.

The above information shows that the Slovak innovation environment still has a long way to go for an ideal situation. In our opinion, however, the right use of project tools in the implementation of innovations could make Slovak firms considerably more efficient

3. Current status of project management in Slovakia

The main aim of our research was to evaluate the current state of project management in Slovakia and to analyze determinants influencing the quality of project management in this area. The processing of the information was necessary to focus on the primary data obtained during the research project IGP 3/2016. As part of our primary research, we approached 154 companies that implement projects in Slovakia. The research was conducted in December 2018 and the final number of respondents was 395. Finally, the survey yielded 154 applicable responses, so the response rate was 39%. Given the specifics of the study and the method (online questionnaire Google form), the response rate was satisfactory

The research methodology was subordinated to the aim of the objectives and content of the paper. Companies surveyed were interviewed a total of 32 questions. When creating the questionnaire, we were inspired by the survey conducted by PMI and EY, which are conducted by a project management survey in the Czech Republic (EY, 2017). We used some questions equally formulated to compare these results. Our research focuses on three main areas:

1) Project Management Tools – There was investigated primarily what project management tools used by individual companies. The evaluation was also the survey, according to which standards the company implements project management or project which uses software tools.
2) Realized projects – In this area was determined by the number of completed projects, types of projects implemented. We focused on the issue of compliance with a prescribed time scale and budget of the project in its implementation and to evaluate the success of the projects themselves.
3) Project Manager and Training – This section is focused on the person of the project manager. His position within the company, in education or in remuneration.

The results are presented in the form of graphs and tables designed using computer software. We also used logic-cognitive methods. Based on these analyses, it is an analysis of the current state of the project environment in Slovakia.

4. Research Results

This part is focused on the presentation of research results on the use of project management in Slovakia. In the research, we performed a cluster analysis and multivariate regression analysis. The dependent variable in multidimensional regression analysis was the desired level of use of project tools, an independent variable sub-component of the tested group of project tools.

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Table1. Categorization of business by region

	BA	TN	TT	NR	ZA	BB	PO	KE
Absolute frequency	52	10	11	18	12	37	8	4
Relative frequency	33,77%	6,49%	7,14%	11,69%	7,79%	24,03%	5,19%	3,90%

Source: the author

Table 1 shows that most of the business involved in our survey are from Bratislava and Banská Bystrica region; lower is the number of business from Nitra, Trenčín, Žilina, and Trnava region (Figure 2). The lowest number of companies involved in our survey are from Prešov and Košice region.

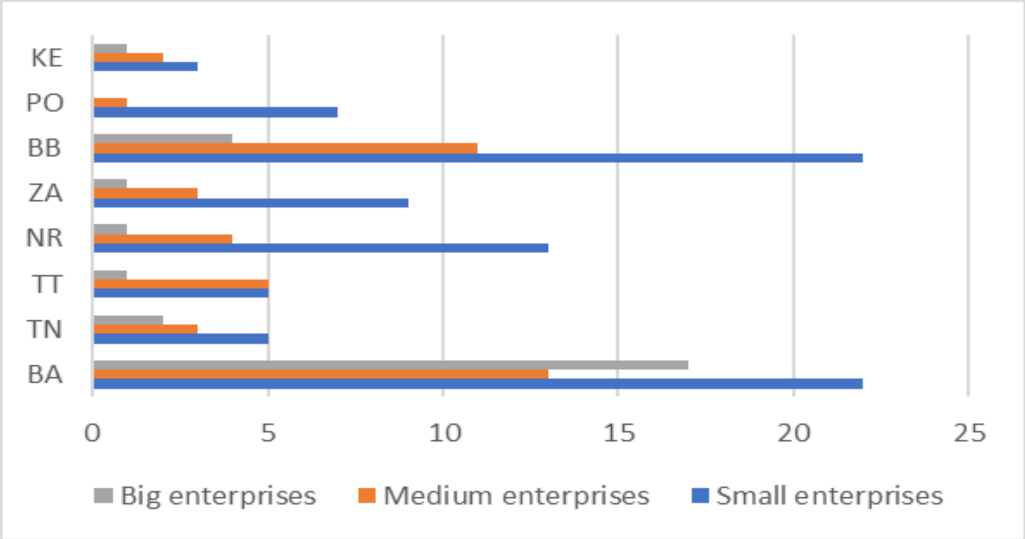

Figure 2. Categorization of business by region according to their the organizational and legal form
Source: the author

The total number of types of enterprises by size it was in our survey represented 54% of small businesses, 27% of SMEs and 19% of large enterprises.

First, we focused on the amount and size of the projects implemented. In our survey, we can see that the number of implemented internal projects has increased slightly in recent years. In 31% of respondents, the number of projects is growing, 11% is falling and 48% is unchanged. Furthermore, our research and our experience show that while growing complexity of projects - their interdependence, the number of stakeholders and the complexity of requirements. Along with the growth of experience in project management are also increasing demands on the management of new projects. According to information from respondents, half of the projects exceeded the budget of 40 thousand EUR (Figure 3).

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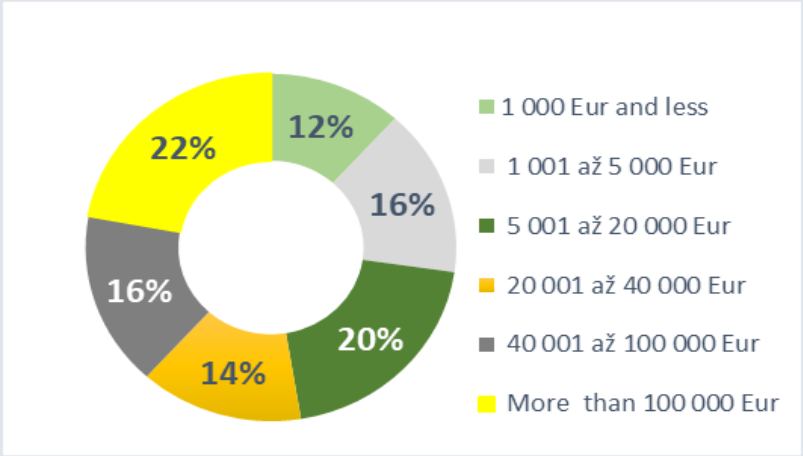

Figure 3. Project budgets in 2018
Source: the author

As part of the survey, we investigated whether and what companies in Slovakia are using project management standards. Respondents' answers showed that the most used project management standards include internal standards (66%), PMI (18%) and IPMA (7%).

An important part of the survey was the success of the projects. Here, based on respondents' answers is exceeded by common budget practice for almost 15% of the projects exceeded the budget by 21%-50%. The survey shows that 29% of the projects exceed the deadline by more than 20%. 46% of projects will end in the planned deadline and budget. The most frequent reasons for overruns and schedule respondents said:

- Change project scope due to poor project identification (54%)
- Consequences of external changes (51%)
- Insufficient staffing of the project team (48%)
- Insufficient supplier management and consequent weak control (47%)
- Communication Problems (41%)
- Different expectations of project outputs (32%)
- Weak Project Management (30%)

If we look at the most frequently realized types of projects in the last two years, up to 51% of the implemented projects were construction projects. As the second most frequent projects are modernization projects, including IT systems integration. The third most common type of projects is cost reduction projects, and the fourth type is standard new product development projects (28%). This fact reflects the state of art commentary and merely illustrates the need to focus on innovative projects.

The evaluation of the results shows that the success of projects is always valuable to companies at least according to one criterion. The most frequently used assessment criteria for success of projects implemented by completion, filled with expectations and within budget. The survey shows that a large number of projects fail in the planning phase of the project (e.g. due to the wrong determination of the project, expected or badly set too optimistic budget). Factors allowing to increase project success are presented in Figure 4 below.

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Figure 4. Factors to increase project success

Source: the author

72% of companies reported that their project management is comparable to industry averages or better and sufficient for their purposes. 18% of respondents expressed their self-criticism that project management in their company needs to be improved in view of future needs. Complications due to underestimation of the importance of project management and project risk management firm would avoid or minimize if involved in the process of professional project managers.

In our investigation we have divided the instruments into two large groups:
1. Tools for initiating and planning project
2. Tools for executing and closing project

In the first part of the survey the use of project tools, we focused on tools that are used in the initializing and planning of the project. The questions were focused on finding out how often and using the following tools: Business case, Project charter, Project schedule, Budget, Plan management, and Communication plan (Figure 5).

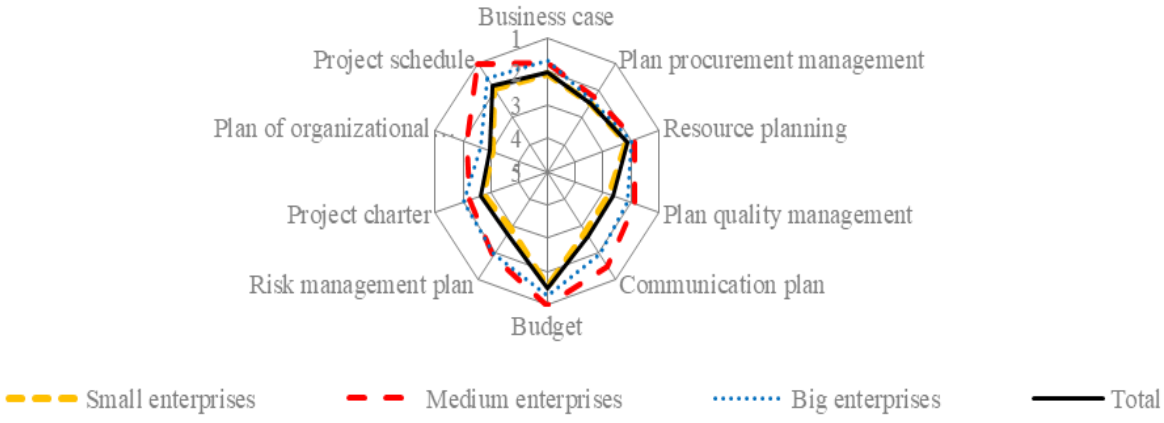

Figure 5. Tools for project initializing and planning by company size
Source: the author

In the previous figure 5, you can see the results in each category in the exploration section on the use of project management tools used in project preparation and planning. The figure shows different uses of these tools in general and size of enterprises. The results show that the most used tool is clearly the project budget. The second most used tool is the project plan. Both tools are the most widely used tools, regardless of enterprise size. On the other hand, the least used tools are organizational change planning and risk plan. The figures show that the results of small enterprises are basically tracking overall results. The situation for medium and large enterprises is clearly

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better in all categories. The evaluation also shows that medium-sized enterprises are used to a greater extent than those of large enterprises.

The second part of the survey evaluated the use of tools that are used in project executing and closing. Evaluated tools in our survey were: Risk Register, Assigning Roles, Issue Log, Change Status Control, Project Status Report, Acceptance Procedures, Lessons Learned, Knowledge Databases and Evaluation of Project Team Members. Also, during the second part of the survey, we focused not only on the overall results but also on the results by company size (Figure 6).

Figure 6. Tools for project executing and closing by company size
Source: the author

Figure 6 shows that as in the previous survey project of the instruments used in the initializing and planning as well as the results of this small company basically replicate the overall results of the sample. The most used tool in the implementation and completion of the project can be considered a Project Status Report. Other tools have a significant gap in their enjoyment. The least used tools are Formal change control. With this tool, it is interesting that medium-sized enterprises use relatively often, and on the other hand, small enterprises basically only rarely. A similar situation can be seen in the case of instruments Risk Register. Overall, Figure 7 shows significantly less use of these project tools than in the project preparation and planning section.

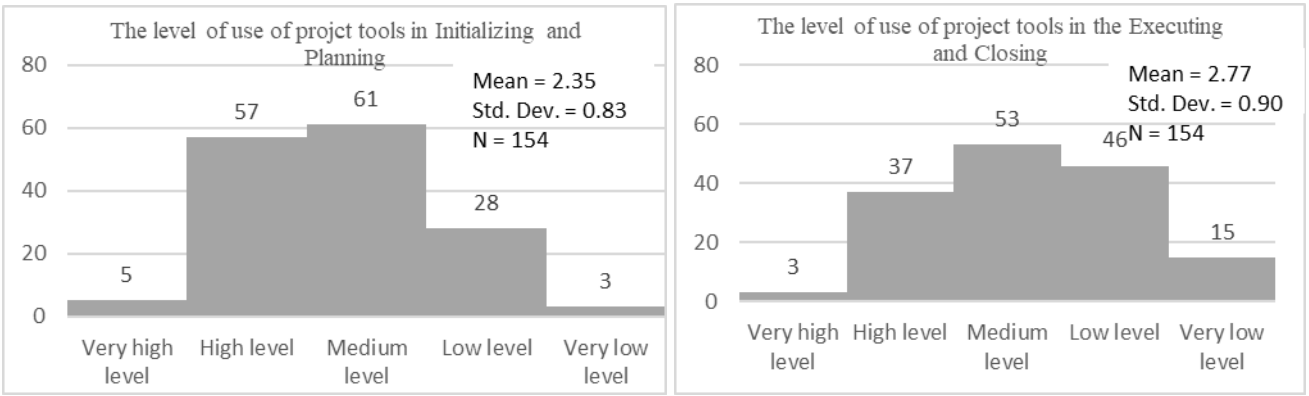

Figure 7. Assessing the use of tools PM
Source: the author

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Figure 7 shows the different level of use of project tools. On the one hand, we have initializing and planning tools where the dominance of enterprises (87%) has reached medium and higher levels of use of these tools. In 43% of enterprises we can reach High level and Very high level. On the other hand, in the assessment of the level of project tools in executing and closing at least medium level, 26% of companies achieved fewer and even 40% of enterprises consider even insufficient to be clearly inadequate. The results show that, while most enterprises try to use project tools in a project initiating and planning, they are not already using these tools in their executing and closing phases of the project, or what often can lead to budget, or project time being exceeded.

In our evaluation, we focused on the use of different project management tools. The following table 2 shows the most and least used project tools in Slovak enterprises.

Table 2. Use of project management tools in Slovakia

The most used tools		**The least used tools**	
Cost Budget	85%	Formal change control	44%
Project schedule	75%	Knowledge databases	40%
Business case	73%	Risk Register	36%
Project Status Report	72%	Acceptance procedures	36%
Resource Plan	65%	Organizational change management plan	34%
Assign project roles	58%	Lessons Learned	32%
Plan procurement management	54%	Risk Management Plan	30%
Project charter	51%		

Source: the author

It can be seen from Table 2 that the cost budget is clearly the most common tool for project management. Next is the project schedule, Business case, and Project status report. On the other hand, it is evident that the least used risk management plan or Lessons Learned.

The most important project management procedures are related to team communication, but also to clients and external experts. Most respondents reported regular status updates and standardized management and communication as important. According to the individual responses we have observed that enterprises that do not adequately evaluate the project status indicators and do not take lessons from the mistakes often exceed the deadlines and repeat them with the reasons for failure.

Overall, the level of use of project management tools in the phases of initiating and planning of the project is at a high level at 40% of enterprises, and only 20% of the enterprises are not using enough. The situation is different in the executing and closing phases of the project. Only 26% of enterprises use the tools in this phase at a high level. 40% of tool enterprises do not use enough and do not use some at all.

Conclusion

This survey deals with project management with the aim to find out how to promote the implementation of innovations and changes in Slovak enterprises. The amount of information collected was broad. As a result, we were able to identify such aspects of project management in Slovak enterprises that are related to their innovation activity.

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On closer examination, we conclude that the results of our survey show that a very neglected area in terms of project tools, the issue regarding the risks. And not only their identification but also work with the risks in terms of their systematic monitoring during the implementation and documentation for future projects. This is connected with the problematic use of tools for formal change management or the use of database knowledge. This situation leads to the fact that just "uncontrolled" risks reduce the success of projects implemented in Slovakia. That is why we can introduce work with risks on the project as one of the main weaknesses of project management in Slovakia. It is evident that when implementing innovations in enterprises, better work with risks would make their implementation more effective.

The reason for making better use of project tools within the initiating and planning phase compared to executing and closing can also by the fact that Slovak enterprises are trying to raise funds for their activities from public sources. In an effort to obtain funding for their innovation activities of enterprises faced with project documents as they are defined in the applications. Most enterprises considered these documents as simply a formal necessity in the context of the realization, when is often these documents for the management of the project does not use. And this is the reason such a large disparity between the use of different types of project tools. The real use of project tools would enable enterprises to better manage their projects and thus avoid budget overruns and project deadlines. As we mentioned above, they manage project management middle and large enterprises. Projects with a budget of 40 to 100 thousand € thus achieve higher success rates (65%) than smaller projects (42%).

In conclusion, despite the relatively high proportion of failed projects, project management evaluation is still positive. Almost sixty percent of respondents consider it sufficient. On the other hand, over forty percent of the company wants to improve it in view of the company's future needs.

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References

APM. 2015. Conditions for project success APM research report. https://www.apm.org.uk/media/1621/conditions-for-project-success_web_final_0.pdf

Benešová, D., Kubičková, V., Michálková, A., Krošláková, M. 2018. Innovation activities of gazelles in business services as a factor of sustainable growth in the Slovak Republic. Entrepreneurship and Sustainability Issues, 5(3), 452 - 466. https://doi.org/10.9770/jesi.2018.5.3(3)

Bresnen, M., Edelman, L., Newell, S., Scarbrough, H., & Swan, J. 2003. Social practices and the management of knowledge in project environments. International Journal of Project Management, 21(3), 157-166. https://doi.org/10.1016/S0263-7863(02)00090-X

Davies, A., & Hobday, M. (2005). The business of projects: Managing innovation in complex products and systems. Cambridge, UK: Cambridge University Press.

De Wit, A. 1988. Measurement of project success. International Journal of Project Management, 6(3), 164-170. https://doi.org/10.1016/0263-7863 (88)90043-9

Doherty, N.F., Ashurst, C., Peppard, J., 2012. Factors affecting the successful realisation of benefits from systems development projects: findings from three case studies. Journal of Information Technology, 27(1), 1–16. https://doi.org/10.1057%2Fjit.2011.8

European Commission, 2018. European Innovation Scoreboard 2018. http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

European Commission, 2019. 2019 European Semester: Country Resports. https://ec.europa.eu/info/publications/2019-european-semester-country-reports_en

EY. (2017). Průzkum projektového řízení v ČR 2017 Výsledky 10. ročníku EY průzkumu [Project Management Survey in the Czech Republic 2017 Results of the 10th EY Survey] https://www.ey.com/Publication/vwLUAssets/Projektov%C3%A9_%C5%99%C3%ADzen%C3%AD_2018/$FILE/EY%20Pr%C5%AFzkum%20projektov%C3%A9ho%20%C5%99%C3%ADzen%C3%AD%20v%20%C4%8CR%202017_v%C3%BDsledky%2010.%20ro%C4%8Dn%C3%ADku.pdf

Howsawi, E, Eager, D. Bagia, R. Niebecker, K. 2014. The four-level project success framework: application and assessment. Organisational Project Management, 1(1), 1-15. http: //dx.doi.org/10.5130/.v1i0.3865

Ika, L.A. 2009. Project success as a topic in project management journals. Project Management Journal, 40(4), 6-19. https://doi.org/10.1002/pmj.20137

Jugdev, K. Müller, R. 2005. A retrospective look at our evolving understanding of project success. Project Management Journal, 36(4), 19-31. https://doi.org/10.1177/875697280503600403

KPMG. 2017. Project Management Survey 2017. Driving business performance. https://assets.kpmg/content/dam/kpmg/nz/pdf/July/projectmanagementsurvey-kpmg-nz.pdf

Lappe, M., Spang, K. 2014. Investments in project management are profitable: a case study-based analysis of the relationship between the costs and benefits of project management. International Journal of Project Management, 32(4), 603–612 https://doi.org/10.1016/j.ijproman.2013.10.005

Lundin, R.A., Arvidsson, N., Brady, T., Ekstedt, E., Midler, Ch., Sydow, J. 2015. Managing and working in project society. Institutional challenges of temporary organizations. Cambridge University Press, Cambridge, England, p. 356.

Midler, C., 1995. Projectification of the firm: the Renault case. Scandinavian Journal of Management. 11, 363–375. https://doi.org/10.1016/0956-5221(95)00035-T

Mir, F.A., Pinnington, A.H., 2014. Exploring the value of project management: linking project management performance and project success. International Journal of Project Management, 32(2), 202–217. https://doi.org/10.1016/j.ijproman.2013.05.012

Petrenko, E., Stolyarov, N. 2019. Features of the management of international projects, taking into account intercultural differences of the partners. *Entrepreneurship and Sustainability Issues*, 6(4), 2037-2051. http://doi.org/10.9770/jesi.2019.6.4(34)

PMI. (2017). A Guide to the Project Management Body of Knowledge. (PMBOK® Guide) –Newtown Square, Pennsylvania: Project Management Institute.

PMI, 2018. Pulse of the Profession 2018: Success in Disruptive Times. Project Management Institute https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-the-profession-2018.pdf

Rammert, W., Windeler, A., Knoblauch, H., Hutter, M. (Eds.). 2015. Innovationsgesellschaft heute. Springer.

Serrador, P., Turner, J.R. 2015. The relationship between project success and project efficiency. Procedia-Social and Behavioral Sciences, 119, 75-84. https://doi.org/10.1002/pmj.21468

Shenhar, A. J., & Dvir, D. (2007). Reinventing project management: The diamond approach to successful growth and innovation. Boston, MA: Harvard Business School Publishing., p 232.

Shenhar, A.J. Dvir, D. 2007. Project management research - the challenge and opportunity. Project management journal, 38(2), 93-99. https://doi.org/10.1177/875697280703800210

Schoper, Y., Gemünden, H.G., Nguyen, N.N., 2016. Fifteen future trends for project management in 2025. In: Knöpfel, Hans, Martinez-Almela, Jesus (Eds.), Future Trends in Project, Programme and Portfolio Management 2016. Proceedings of the International IPMA Expert Seminar in Zurich in February 18–19, 2016, pp. 23–43. https://re.public.polimi.it/retrieve/handle/11311/1019866/197284/ExpSemProc16-rzd.pdf

Standish Group, 2018. CHAOS Report: Decision Latency Theory (2018). https://www.standishgroup.com/store/services/10-chaos-report-decision-latency-theory-2018-package.html

Supeková, S. 2014.International Business IV. Vol. 2, Project management. 1st ed. Nitra: ForPress Nitrianske tlačiarne. ISBN 978-80-89731-20-6

Štatistický úrad Slovenskej Republiky. 2018. Innovation activity of enterprises in the Slovak Republic 2014 – 2016. https://slovak.statistics.sk/wps/wcm/connect/252f80f5-0daf-49c5-b315-15a296e69dad/Inovacna_aktivita_podnikov_v_Slovenskej_republike_2014_2016.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-252f80f5-0daf-49c5-b315-15a296e69dad-munA5VE

Winch, G. M. 2014. Three domains of project organising. International Journal of Project Management, 32(5), 721-731. https://doi.org/10.1016/j.ijproman.2013.10.012

Zwikael, O., Smyrk, J., 2015. Project governance: balancing control and trust in dealing with risk. International Journal of Project Management 33(4), 852–862. https://doi.org/10.1016/j.ijproman.2014.10.012

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DEVELOPING ENTERPRISE COMPETITIVE ADVANTAGE AS A COMPONENT OF ANTI-CRISIS MANAGEMENT

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Abstract. The article describes the concept of enterprise anti-crisis management, an important component of which is the formation and development of competitive advantages. Due to various factors, enterprise competitive advantages can be internal, which are, being subject to change, completely controlled by management of enterprises, and external – the ones that enterprises cannot quickly deal with. The study analyses the current state of activity of the information and telecommunications enterprises in Ukraine, which results in the determined reasons for a slowdown in development of small and medium-sized telecommunication enterprises (SMEs). The list of services of telecommunication enterprises, amongst which mobile communication services are of the highest demand, is provided. The problems of Ukraine's mobile communication market development are determined. It is emphasized that enterprises should constantly implement anti-crisis management, which implies the development of telecommunication enterprise competitive advantages. Using the multi-factor correlation-regression analysis, a model of the dependence of net profit on the main types of costs is constructed. Applying the model will enable telecommunication enterprises to predict change in the net profit depending on changes in labour costs and costs of social events, material costs, depreciation and other operating costs, which will contribute to the development of their competitive advantages. The study offers the anti-crisis management mechanism providing timely determination of availability, as well as expediency of development of a competitive advantage, for a telecommunication enterprise.

Keywords: development; competitive advantages; anti-crisis management; enterprise; profit, costs

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JEL Classifications: L1, M10, M19, M21, O14

1. Introduction

Under today's market conditions, enterprises, in any field of activity, operate under strong competition. Nowadays, there is a decline in the competitiveness of many Ukrainian enterprises with the deepening of existing crisis situations in their activities and emergence of new ones together with deterioration of living conditions and financial results. Dynamic environment external factors, including negative ones, also have a significant impact

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on the activities of the enterprises. Thus, the timely use of anti-crisis management can help them create adequate conditions to ensure financial stability and competitiveness.

In scientific literature, anti-crisis management is determined as a use of radical measures in order to survive (Aleksandrov, 2010). Economists describe anti-crisis management as activities intended for an enterprise to overcome a condition when a threat is posed to the functioning of the enterprise, and the enterprise's survival is considered as the main objective (Grant, 2003; Korotkova, 2009; Brauer, 2013; Baikovs, Zariņš, 2013; Wahl, Prause, 2013; Jankelová et al., 2018). Such activities are characterised by an intensive and expeditious application of certain measures and methods designed to overcome the critical condition of the enterprise. In such cases, the focus is placed on the issues of the situation along with the speedy implementation of targeted measures (De Pamphilis, 2010; Sakalas, Virbickaitė, 2011).

Some authors focus exclusively on crisis diagnostics and bankruptcy proceedings, completely forgetting about methods of anti-crisis management. Others argue that for anti-crisis management, it is essential to ensure such conditions that financial difficulties could not be of a permanent and stable nature (Goodhart, 2006; Baldin et al., 2011; Bragg, 2012; Brauer, 2013; Baikovs, Zariņš, 2013; Laužikas, Krasauskas, 2013).

Anti-crisis management, in its widest sense, is a system of managerial measures to diagnose, prevent, neutralize and overcome crisis phenomena and their causes at all levels of the economy. In other words, it is risk management and prevention of bankruptcy (Larionova, 2016).

Consequently, if the enterprise, at the present stage of its development, is functioning successfully, the goal of anti-crisis management is to prevent a crisis situation with preventive measures. If the enterprise is in a crisis situation, the goal of crisis management is financial improvement of the enterprise, application of measures to prevent bankruptcy, overcoming the crisis.

There are many reasons for crisis. They are divided into objective, related to the cyclical needs of modernisation and restructuring of the enterprise, as well as adverse environmental effects, and subjective, reflecting errors and voluntarism in management, as well as psychological factors. The causes for the crisis can be natural, which is associated with the phenomena of climate, earthquakes, floods and other natural disasters, and they may have an anthropogenic character associated with human activity. The causes for the crisis may be external and internal. The external ones are related to trends and strategies of macroeconomic development, or even the development of the world economy, competition, political situation in the country. The internal ones are connected with the problems that arise at the enterprise itself (Vasylenko, 2005). According to Khandiy (2012), the wrong perception of reality management and implementation of the false vision, creating the illusion of the enterprise's perfection, risky marketing strategy, internal conflicts and shortcomings in production, inadequate governance, innovation and investment policy, and sometimes inadequate actions and habits of executives belong to such problems. Therefore, the first place among the causes of internal crisis situations belongs to the influence of the human factor.

Enterprise anti-crisis management pursues the aim of timely diagnosing the threat of enterprise bankruptcy and the extent of the critical condition, developing and implementing appropriate measures intended to overcome the critical condition of the enterprise and restore its solvency and financial stability. Moreover, the enterprise, relying on the main principles of anti-crisis management, develops a specific action plan that meets the stages of enterprise anti-crisis management. Anti-crisis management is based on the relevant principles and stages which distinguish anti-crisis management from ordinary corporate governance (Garškaitė-Milvydienė, 2014).

The most common measures of crisis prevention at the enterprise comprise: strategic planning, adequate resource allocation at all levels of governance, the use of an effective system of control, involvement of external

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consultants when there is insufficient competence of management on various issues, competitiveness analysis, market analysis, financial analysis, human resource performance motivation system analysis, risk forecasting and taking measures on their reduction (Pestun et al., 2007).

Realisation of crisis management measures in practice allows enterprises to reduce the size of possible losses, to reduce the likelihood of emerging crisis situations, to increase the potential for counteraction to crisis phenomena, to improve the adaptability of enterprises and to strengthen their competitive positions in the market.

Anti-crisis management also involves objective evaluation of enterprises' development prospects for the long-term period, aimed at preserving the existing and forming new competitive advantages in order to increase the competitiveness of enterprises, as well as their profitability. Formation and development of competitive advantages can be an important component of enterprise anti-crisis management.

According to Porter (1985), "competitive advantages are a combination of factors that determine the success or failure of an enterprise in competition, productivity of resource use, etc". Lambin et al. (2007) understands competitive advantage as "a feature or quality (attribute) of the product or a trademark that provides the company with an edge over its direct competitors. This advantage is determined by comparison with the best (the most dangerous, priority) competitors". According to Azoev and Chelenkov (2000), "competitive advantages are a concentrated manifestation of advantages over competitors in economic, technical, organizational spheres of the enterprise, which can be measured by economic indicators (additional profit, higher profitability, market share, sales). Competitive advantage cannot be identified with the potential opportunities of the enterprise. Unlike opportunities, this is the fact that is fixed as a result of real and unquestionable preferences of customers".

Formation of competitive advantages occurs under the influence of two types of factors: strategic and tactical. Strategic factors arise when the enterprise outperforms its competitor by a factor in its external or internal environment over a long period of time. Tactical factors arise when the enterprise outperforms its competitor regarding certain elements of the external and internal environment in the near future.

Among scientists, there is no unambiguous idea about the definition of sources of the formation of competitive advantages. Shekhovtseva (2001) notes that factors of production (natural resources, favourable conditions for the production of goods, skilled labour); effective investment in education, technology, licenses; creation of new types of products, production processes and other innovations; use of created wealth to ensure economic growth should be considered the sources of competitive advantage. Lihonenko (2005) highlights a significant reduction in the cost of production at the expense of lower prices for the purchase of material, labour and financial resources; an increase in activity volume, consolidation of enterprises allowing minimizing management and conditional fixed expenses; deploying activities in segments with better conditions, such as the best tax climate as sources for achievement of competitive advantages. Other scientists (Campbell et al., 2003) consider the following factors to be the sources of the emergence of excellent opportunities of the enterprise: the structure – a unique network of internal and external relations of the organisation, which provides it with highly effective activities, that is, the existence of such unique relationships with suppliers, distributors and customers that competitors do not enjoy; a reputation based on several sources, including product quality, characteristics, design, service, etc.; innovations - the ability of an enterprise to outpace competitors and hold leadership depending on its achievements in research, design, new developments and marketing policies; strategic assets – a natural monopoly, patents and copyrights restricting competition also contribute to the acquisition of competitive advantage. Vasylenko and Tkachenko (2004) note that the most typical sources of competitive advantage can be attributed to: new technologies; changes in the structure and value of individual elements in the technological chain of production and sales of goods; new consumer requests; emergence of a new segment of the market; changing the rules of the game on the market. Scientists provide a special source of information about their own business, as well as professional skills that enable them to receive and process such information in such a way that the result is a certain competitive

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advantage.
Summing up the approaches of different scientists to determination of the sources of competitive advantage formation, we have identified the following main sources of competitive advantage formation: the presence of qualified staff; use of innovations, modernisation of equipment, creating new products and services that meet the needs of the consumers; setting prices oriented on demand and competition; improving quality of goods and services; high level of social responsibility.

Depending on the various factors, Lambin et al. (2007) grouped the company's competitive advantages into two categories that can be internal and external. A competitive advantage is internal if it is based on the preponderance of the enterprise in terms of production costs, enterprise management or production, which creates value for the manufacturer, making it possible to achieve a lower cost than the competitor. The internal competitive advantages include: production; technological; qualificational; organizational; managerial; innovative; hereditary; economic and geographic. The analysis shows that the basis of the overall competitive advantage of the enterprise is the internal competitive advantages that reflect the potential of the enterprise to achieve its competitive position. External competitive advantages, on the one hand, orient the enterprise to develop and use those or other internal advantages, but, on the other hand, they provide it with stable competitive positions, since they are oriented towards the purposeful satisfaction of the needs of a specific group of consumers. The company is not able to influence the external factors quickly, but the internal factors are almost completely controlled by the management of the enterprise, that is, management has all the necessary conditions for controlling these factors (Lambin et al., 2007).

The purpose of the research is to substantiate the feasibility of forming and developing enterprise competitive advantages as a component of anti-crisis management.

2. An Overview of the Current State of Information and Telecommunications Enterprises

Information and communication technologies and information and communication systems under the current conditions of global civilization development are the key resource of society and the state, as well as a necessary precondition for their competitiveness in the global market. It is the information sphere that can act as a leading factor in the implementation of the most important social projects of dynamic development, the formation of civil society, the entry into the world community, etc. The European Digital Agenda for Europe 2020 initiative identifies the role of information and communication technologies as a key factor in building up the social and economic potential of cutting-edge technologies, an important information environment for society as a whole, enhancing the well-being of its citizens, and automating entrepreneurship (Senchenko, Hladkov, 2016).

As it is stated in the Law of Ukraine "On the Basic Principles for the Development of an Information-Oriented Society in Ukraine for 2007–2015": "One of the main priorities of Ukraine is the desire to build a people-centred, open to all and development-oriented information society in which everyone could to create and store information and knowledge, have access to them, use and exchange them, in order to enable each person to fully realize his or her potential, promoting social and personal development and promoting and quality of life" (Verkhovna Rada of Ukraine, 2007). The objectives, goals and directions of the development of the information society in Ukraine were defined together with the adoption of the Law.

Under globalization and the universal processes of informatisation in the global economy, the telecommunication market, which demonstrates stable and high growth rates, is becoming increasingly important. The rapid growth of the telecommunications market has been a result of the rapid development of science and technology, raising the standard of living of people with new needs emerging in telecommunication equipment and services, in particular, in the services of mobile communication, Internet and satellite television.

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The telecommunications sector, at the present stage, is one of the priorities in the economic development of many states, including Ukraine, for information exchange plays a decisive role in gaining competitiveness, both in the Ukrainian and world markets of goods and services. Telecommunications, as the final product of the operators' activities, have certain characteristics (Zagorulko et al., 2015):
1) telecommunication services are usually provided during the long period of time;
2) the process of providing communication services cannot be separated from their consumption;
3) the calculation of the cost of services is determined by taking into account many indicators, usually once a month, in the totality of services provided for this period;
4) the process of information transfer is two-way, between two subscribers located at different geographical points inside or outside the country.

Table 1. The Dynamics of the Number of the Information and Telecommunications Enterprises in Ukraine, Units

Indicator	Year					2017 (%) to 2015
	2013	2014	2015	2016	2017	
Large Business Entities	12	6	6	6	6	50,00
Medium Business Entities	406	374	338	331	324	79,80
Small Business Entities, including	14467	12939	13273	11595	13083	90,43
Micro Business Entities	12304	11113	11530	9933	11397	92,63
Total	14885	13319	13617	11932	13413	90,11

Source: authors` own calculations using the data given by the State Statistics Service of Ukraine

According to the data of Table 1, in Ukraine, during the period of 2013-2017, among the information and telecommunications enterprises, the small business entities, in particular micro business entities, accounted for the largest number, although their number declined in dynamics. The number of subjects of large and medium business entities also decreased, which accordingly led to a fall in the total number of the information and telecommunications enterprises in 2017 compared with 2013 by 9,89 %.

During the period analysed, there were some changes in the structure of cash inflows from the sale of goods and services by information and telecommunications enterprises (Table 2).

Table 2. The Dynamics of the Cash Receipts from Sale of Goods and Services by the Information and Telecommunications Enterprises in Ukraine

Indicator	Year										2017 (%) to 2013
	2013		2014		2015		2016		2017		
	million UAH	%	million UAH	%	million UAH	%	million UAH	%	million UAH	%	
Large Enterprises	39236,0	48,8	36411,2	43,3	38495,5	38,3	39808,6	33,9	42601,0	30,6	108,6
Medium-Sized Enterprises	24181,7	30,1	28797,5	34,2	36183,3	36,0	44258,3	37,7	55554,6	39,9	229,7
Small Enterprises, including	16992,7	21,1	18894,9	22,5	25911,6	25,7	33340,3	28,4	40961,4	29,5	241,1
Microenterprises	6032,2	7,5	6557,2	7,8	9468,7	9,4	13452,6	11,5	17004,1	12,2	281,9
Total	80410,4	100,0	84103,6	100,0	100590,4	100,0	117407,2	100,0	139117	100,0	173,0

Source: authors` own calculations the data given by the State Statistics Service of Ukraine

It should be noted that in the period of 2013-2017, small business entities predominated in Ukraine, however, the cash receipts from the sale of their goods and services were the smallest. As a whole, a positive tendency to

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increase cash receipts from sales of goods and services of all sizes of information and telecommunications enterprises, namely, in general, within the period of five years by 73 % can be noticed.

The study found that a decrease in the number of information and telecommunications enterprises was primarily due to the presence of a large number of enterprises in the market and a high level of competition.

As shown in Fig. 1, considering large information and telecommunication enterprises, the amount of losses from the sale of goods and services in 2014 and 2015 was slightly higher than the amount of profits, and during all other years, the profits were significantly higher than the losses. At the same time, during 2013-2015, half of large enterprises were unprofitable, and since 2016, the share of unprofitable enterprises in their total number decreased to 33.3%.

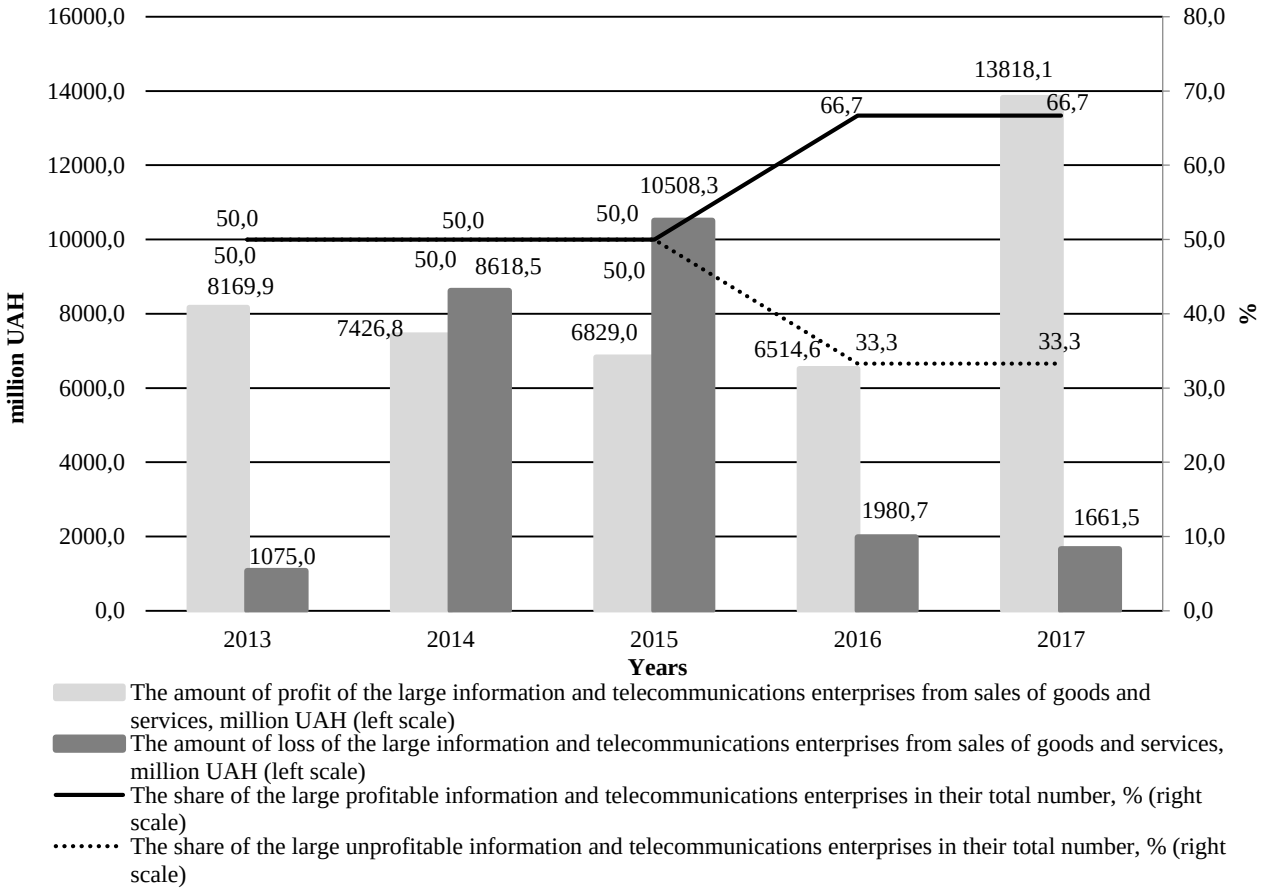

Fig. 1. The Dynamics of the Number of the Large Profitable and Unprofitable Information and Telecommunications Enterprises of Ukraine and the Amounts of Their Profit and Loss
Source: author's own calculations using the data given by the State Statistics Service of Ukraine

Since the current conditions of functioning of telecommunication enterprises are characterised by constant changes (increasing the efficiency of management of business processes, increasing the dynamics of consumer lifestyle and their demands under the influence of increasing information availability and improvement of technological and innovative components), the speed of growth in the quality of goods and services should be consistent with existing changes and timely upgrade. Therefore, the success of an enterprise depends on the

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ability to effectively use its competitive advantages, and consequently - to increase its competitiveness. That tendency has been observed in recent years in the activities of large telecommunication enterprises. In addition, owners of most of the major telecommunications companies in Ukraine are foreigners who invest a significant portion of funds in expansion and modernization of their activities, which, accordingly, enables consumers to enjoy services that meet international standards.

According to the data of Fig. 2, the amount of losses received by the medium-sized information and telecommunications enterprises in Ukraine during 2014-2016 was considerably higher than the amount of profits, which accordingly led to a decrease in their number during the period under study. However, a positive tendency, namely, the share of profitable enterprises in the total number of medium-sized telecommunication enterprises increasing annually can be observed, which indicates strengthening of the positions of that category of enterprises.

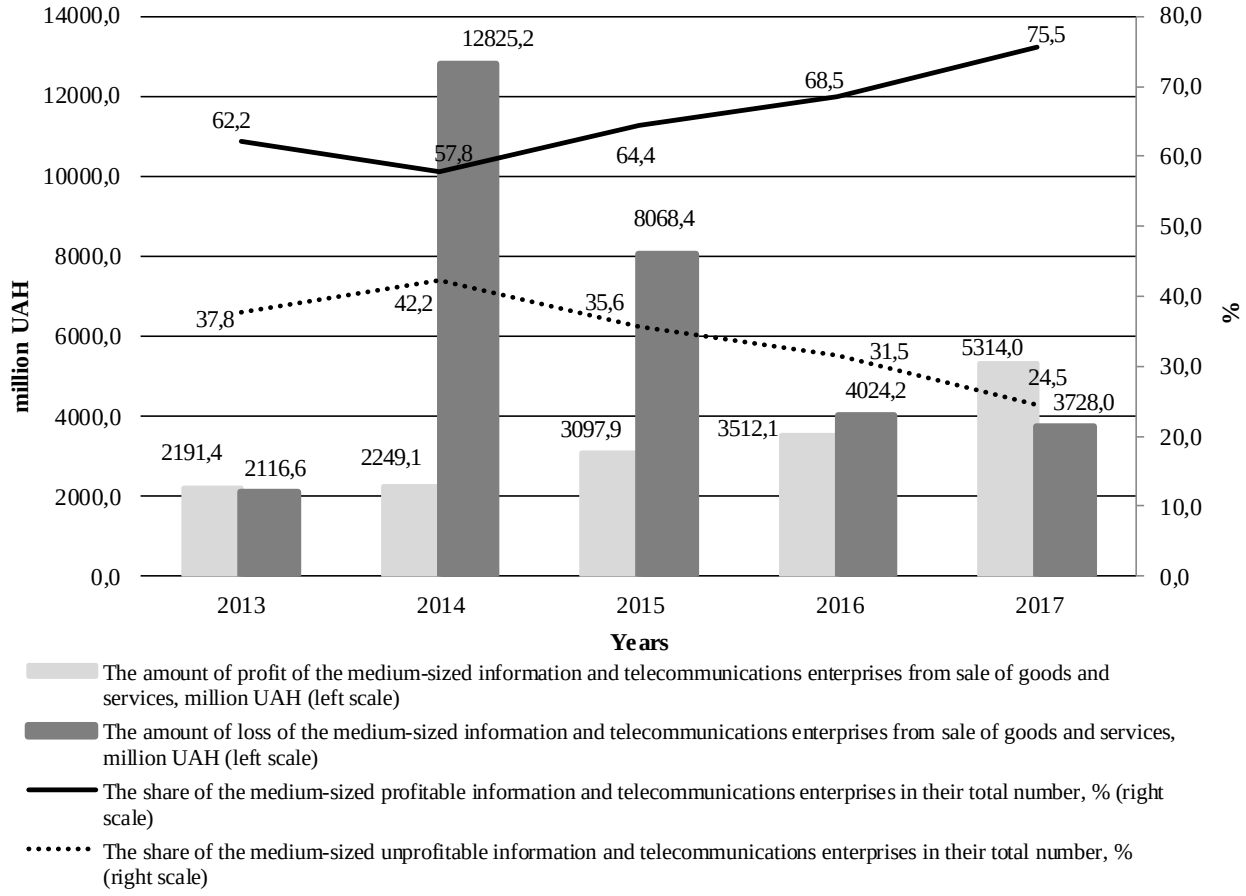

Fig.2. The Dynamics of the Number of the Medium-Sized Profitable and Unprofitable Information and Telecommunications Enterprises of Ukraine and the Amounts of Their Profit and Loss
Source: authors` own calculations using the data given by the State Statistics Service of Ukraine

A similar situation is observed with respect to the performance of the small telecommunication enterprises: in 2013-2015, the amount of losses was higher than that of profits, and only since the year 2016, there was an opposite tendency (Fig. 3). As for the share of the unprofitable enterprises in the total number of small telecommunication enterprises, it had decreased by 2015, and since 2016 it began to increase again, indicating a decrease in the competitiveness of small enterprises and their displacement from the market.

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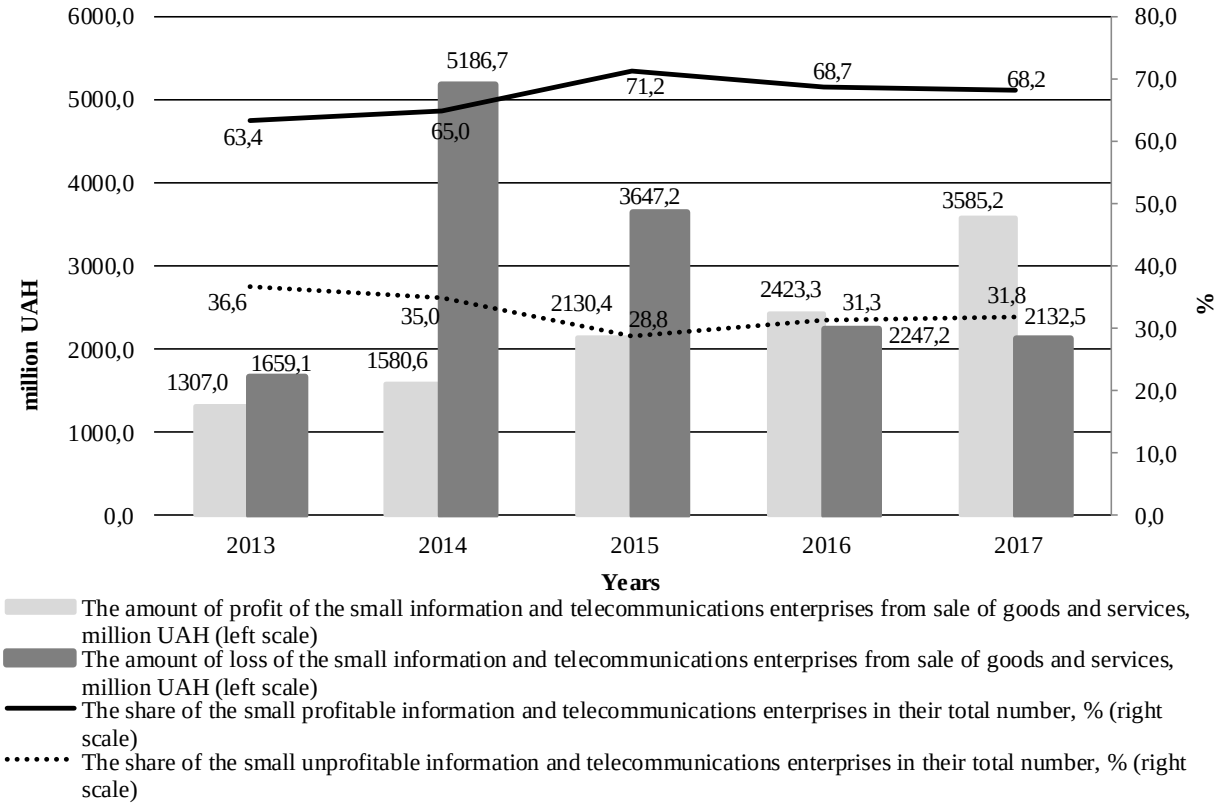

Fig.3. The Dynamics of the Number of the Small Profitable and Unprofitable Information and Telecommunications Enterprises of Ukraine and the Amounts of Their Profit and Loss
Source: authors` own calculations using the data given by the State Statistics Service of Ukraine

Summarizing the above-mentioned, the following reasons for the slow/weak development of small and medium telecommunication enterprises can be distinguished:
- lack of appropriate economic incentives for attracting investment resources into innovative processes, in particular, availability of credit resources;
- limited amount of financing of science and innovation activities, as well as irregular and not always guaranteed stimulation of telecommunication business support and development programmes;
- lack of clear guidelines for the development of enterprises on an innovative basis;
- low qualification, quite low level of competence of employees of enterprises due to low experience in telecommunications, lack of staff skills in communication management etc.;
- excessive competition with foreign companies;
- lack of efficient and effective cooperation between large, medium and small telecommunication enterprises;
- an increase in the degree of various types of risk, in particular, the excessive risk of competition and the emergence of mass bankruptcy of enterprises;
- the presence of constant changes in the market of telecommunication services, the need for periodically appropriate updates and upgrades.

Telecommunication enterprises provide their customers with various types of services, which can be grouped as the following ones: fixed telephony services; mobile communication; broadcasting, retransmission of television and radio programmes, technical maintenance and exploitation of equipment in broadcast networks, radio communication; Internet services and other services that include telegraph and satellite communications, wireline broadcasting, etc. The share of the cash inflows from the sale of these types of services is different (Figure 4).

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Thus, more than half of the cash receipts over 2013-2017 was received from providing mobile communications services. However, the share of the cash receipts from providing mobile communications is decreasing annually, whereas the share of the cash inflows from Internet services is increasing.

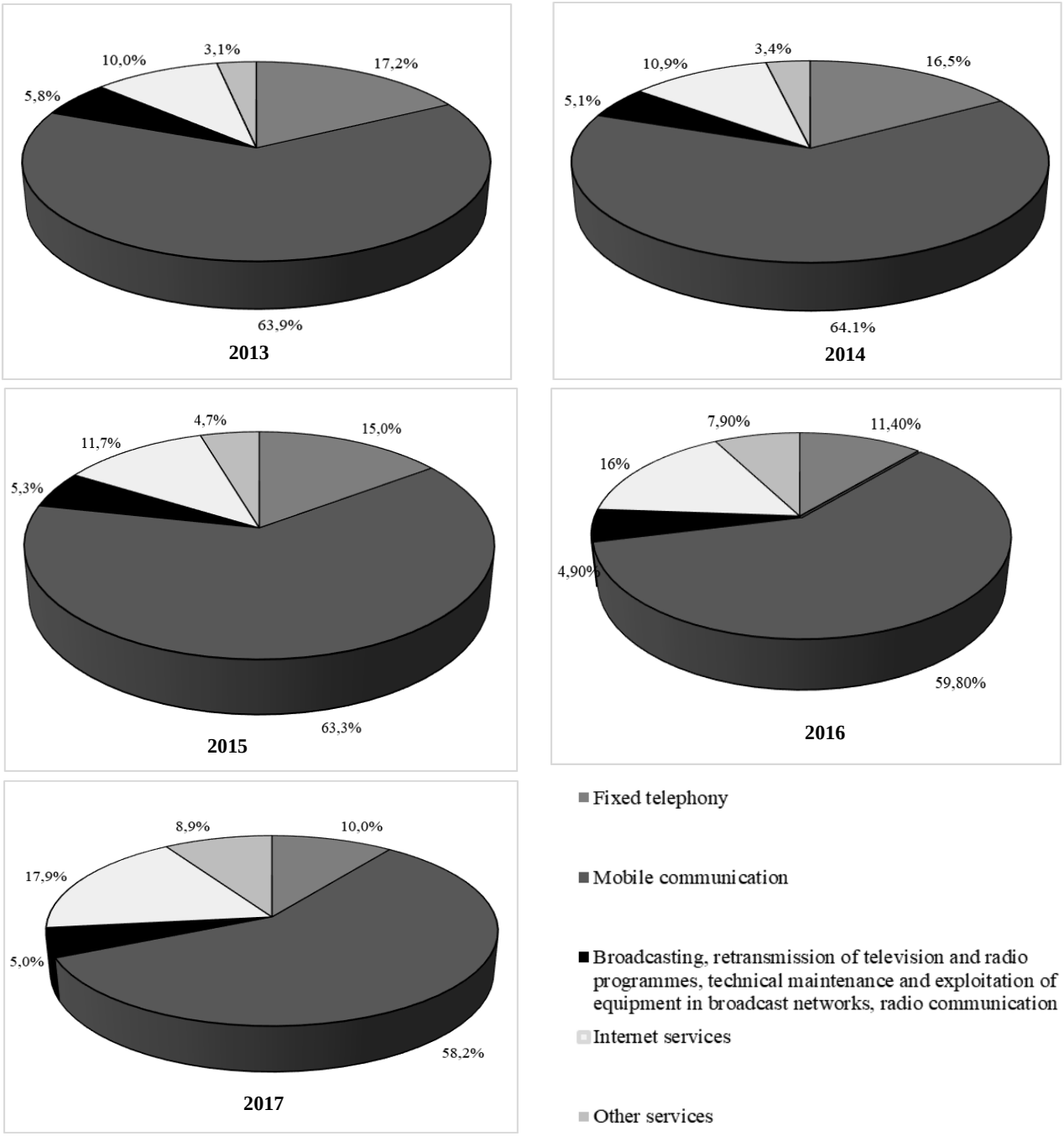

Fig.4. The Dynamics of the Share of Cash Receipts from Selling Goods and Services by the Information and Telecommunications Enterprises
Source: authors` own calculations using the data given by the State Statistics Service of Ukraine

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According to the results of the conducted research, the development of the telecommunication market of Ukraine began precisely from mobile communication. It originated in 1992 with the establishment of the joint Ukraine-Danish-German-Dutch company UMC that received a license for mobile communication and frequencies. The important date in the development of the mobile communication in Ukraine was 1 July 1993 when the company UMC launched the first mobile communication network in Ukraine of analogue NMT standard. The next step was the establishment of Kyivstar company in 1994. The first call on that operator network took place on 9 December 1997. As a result of the emergence of two mobile operators, the mobile communication market became competitive (Zagorulko et al., 2015).

Figure 5 shows the dynamics of the number of subscribers of mobile communications in Ukraine and the income from providing services to them.

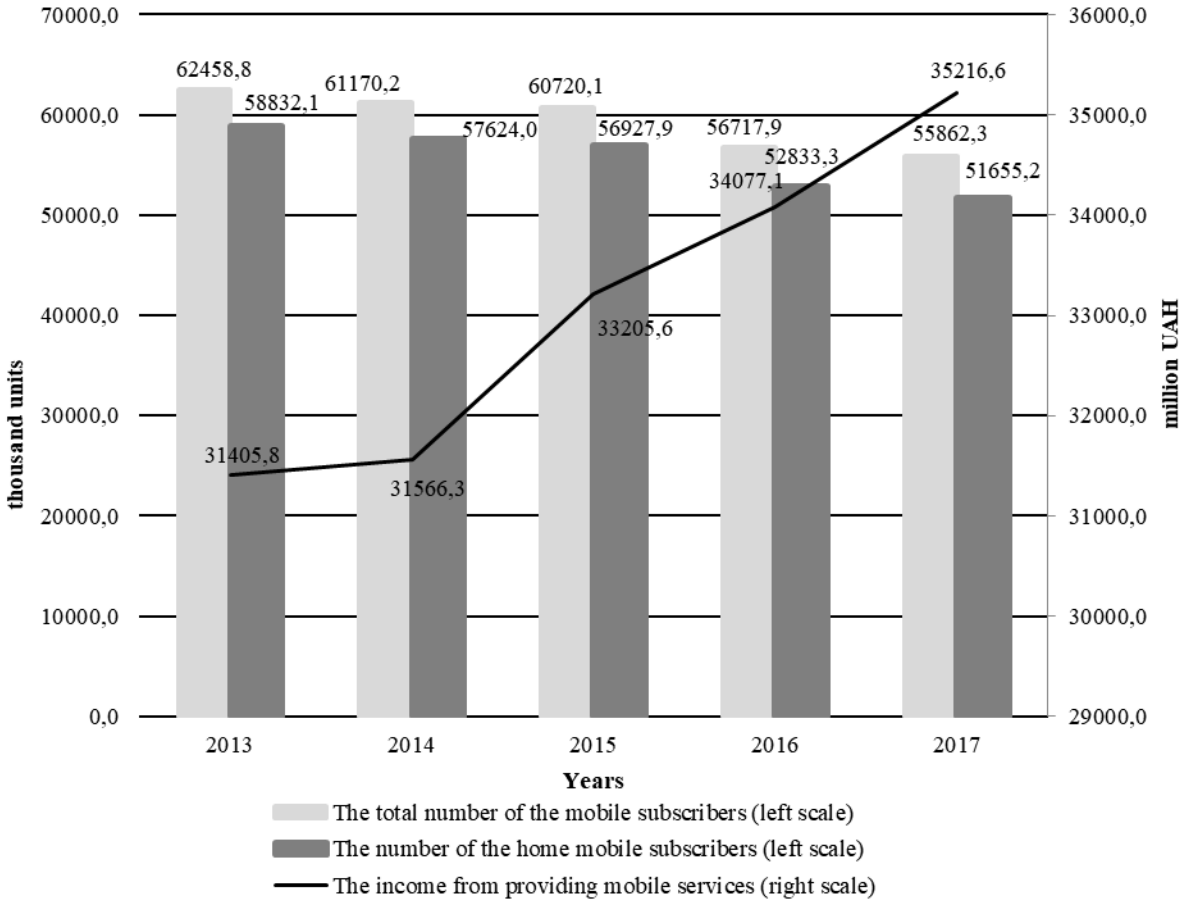

Fig.5. The Dynamics of the Number of the Mobile Communication Subscribers in Ukraine and the Income from Providing Services to Them
Source: authors` own calculations using the data given by the State Statistics Service of Ukraine

As shown in Fig. 5, during the period under study, the number of subscribers of mobile communications decreased annually, whereas the income from providing services to them increased. That can be explained by the fact that due to the annual increase in prices for package services of mobile operators, there was a decline in the simultaneous use of several SIM cards by subscribers.

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In 2018, there were 5 companies operating on the territory of Ukraine, providing mobile communication and mobile Internet services. Certain companies were the first, and they remained in the leading position, namely, PJSC Kyivstar and PJSC Vodafone Ukraine (former UMC). LLC Lifecell also occupied an outstanding place in the market, but significantly inferior to the leaders. The smallest market share was occupied by Intertelecom and TriMob LLC.

Mobile operators offer access to the UMTS-HSPA+ standard, also known as the third generation mobile communications (3G) standard. In addition to 3G, standards such as GSM (2G), CDMA2000 (3G) and LTE (4G) operate on the territory of the country. 4G is the most up-to-date and high-quality standard, which has increasingly been covering the territory of Ukraine recently.

Today, the mobile communications market is rapidly evolving and changing, which provides it with high attractiveness for investors. The largest region in the world with the number of mobile subscribers is North America, then – Western Europe, the countries of the Asia-Pacific region and Japan. Speaking of individual countries, the leaders in the use of mobile phones are the Scandinavian countries (Yatskevych, 2010).

As for the Ukrainian mobile communications market, there are some problems in its development, namely: technological backwardness of market players and the presence of general economic barriers to development. The dynamism of the market determines the need for operators to continuously improve existing services and implement new ones to meet the growing needs of users and maintain competitive advantage. At the same time, it is important to implement enterprise anti-crisis management.

2. Research Methodology

One of the objectives of enterprise anti-crisis management suggesting development of its competitive advantages is ensuring profitability. As it can be seen from practice, the profits from sale of goods and services account for the main part of the total enterprise profit. When forming that kind of profit, the final result is defined as the difference between incomes received from sale of goods and services and the costs that the enterprise carries. Therefore, in general, formation of profits from selling goods and services is managing revenue from sales and incurred costs.

To determine the key indicators of the impact of costs on the formation of profits of communications companies, multivariate correlation-regression analysis was used (Marmoza, 2013; Husarov, 2002; Mazurenko, 2006; Tarasenko, 2006; Halytska, Kovtun, 2012; Horkavyi, 2012). It has the following stages:

Stage 1. Selecting all possible factors that affect the indicator (or process) that is being studied. Each factor determines the numerical characteristics, if some factors cannot be quantified/qualitatively determined or statistics are not available, they are removed from further consideration.

Stage 2. Choosing the kind of regression or multivariate model, i.e. finding an analytic expression that reflects the connection of factor characteristics with the resultant (function selection) the fullest (Marmoza, 2013):

$$\hat{Y} = f(x_1, x_2, x_3, ..., x_d), \tag{1}$$

where $\hat{Y}$ – effective sign-function; $x_1, x_2, x_3, ..., x_d$ – a factor of the sign.

In practice, the multiple regression equations are linearised:

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$$\hat{Y} = a_0 + a_1 x_1 + a_2 x_2 + ... + a_d x_d, \quad (2)$$

where $a_0, a_1, ..., a_d$ – equation parameters to be determined.

If each factor, including effective first signs, is known, d values $y_h, x_{1h}, x_{2h}, ..., x_{dh}$, when $h = 1, 2, ..., m$, then using the standard procedure of the least squares method, a system of linear algebraic equations for the estimation of the parameters of the regression equation is obtained:

$$\begin{cases} a_0 m + a_1 \sum_{j=1}^{m} x_{1j} + a_2 \sum_{j=1}^{m} x_{2j} + ... + a_d \sum_{j=1}^{m} x_{dj} = \sum_{j=1}^{m} y_j; \\ a_0 \sum_{j=1}^{m} x_{1j} + a_1 \sum_{j=1}^{m} x_{1j}^2 + a_2 \sum_{j=1}^{m} x_{1j} x_{2j} + ... + a_d \sum_{j=1}^{m} x_{1j} x_{dj} = \sum_{j=1}^{m} x_{1j} y_j; \\ ... \\ a_0 \sum_{j=1}^{m} x_{dj} + a_1 \sum_{j=1}^{m} x_{dj} x_{1j} + a_2 \sum_{j=1}^{m} x_{dj} x_{2j} + ... + a_d \sum_{j=1}^{m} x_{dj}^2 = \sum_{j=1}^{m} x_{dj} y_j. \end{cases} \quad (3)$$

The received system $d+1$ of equations $d+1$ with unknowns $a_0, a_1, ..., a_d$ can be solved by methods of linear algebra. For a large number of equations, it is most appropriate to use the Gauss method with the choice of a principal element. Since the matrix of this system of linear algebraic equations is symmetric, its solution, the only one, always exists. If the number of equations is small, the inverse matrix method to solve the problem can be successfully used.

Stage 3. Checking the adequacy of the model. Doing that requires the following calculations:

– the remnants of the model, i. e. the differences between the observed and estimated values (Marmoza, 2013):

$$u_h = y_h - \hat{y}h = y_h - (a_0 + a_1 x_{1h} + a_2 x_{2h} + ... + a_d x_{dh}), \; h = 1, 2, ..., m; \quad (4)$$

– relative error of the remnants and their average value:

$$\delta_h = \frac{u_h}{y_h} \cdot 100\%, \; \delta = \frac{\sum_{h=1}^{m} \delta_h}{m}; \quad (5)$$

– mean square error of dispersion of perturbations:

$$\sigma_u = \sqrt{\frac{\sum_{h=1}^{m} u_h^2}{m - d - 1}}; \quad (6)$$

– determination coefficient:

$$R^2 = 1 - \frac{\sum_{h=1}^{m} u_h^2}{\sum_{h=1}^{m} (y_h - \bar{y})^2}$$

or

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$$R^2 = 1 - \frac{\sum_{h=1}^{m}(y_h - \hat{y})^2}{\sum_{h=1}^{m}(y_h - \bar{y})^2}; \quad (7)$$

– coefficient of multiple correlation R that is the main indicator of the density of the correlation connection of the generalized indicator with the factors:

$$R = \sqrt{1 - \frac{\sum_{h=1}^{m}(y_h - \hat{y}_h)^2}{\sum_{h=1}^{m}(y_h - \bar{y})^2}}. \quad (8)$$

All values are the correlation coefficient R interval from -1 to 1. The coefficient sign shows the "direction" of communication: the positive value indicates a "direct" communication, negative - the "reverse" relationship, and "0" - the lack of linear correlation. If $R = 1$ or $R = -1$, there is a functional connection between the signs. Multiple correlation coefficient R is the main characteristic of the closeness of the relationship between effective and feature set of the signs of factors.

Stage 4. Checking the statistical significance of the results. The check is done using the Fisher's statistics with d and $(m - d - 1)$ degrees of freedom (Marmoza, 2013):

$$F = \frac{\frac{\sum_{h=1}^{m}(\hat{y}_h - \bar{y})^2}{d}}{\frac{\sum_{h=1}^{m}(y_h - \hat{y}_h)^2}{m - d - 1}}$$

or

$$F = \frac{R^2}{1 - R^2} \cdot \frac{m - d - 1}{d}, \quad (9)$$

where d – the number of factors included in the model;; m – total number of observations; $\hat{y}_h$ – estimated value of the dependent variable at h- observation; $\bar{y}$ – the average value of the dependent variable; y_h – the value of the dependent variable in the h- observation; R – coefficient of multiple correlation.

According to the Fisher's table, the critical value of $F_{кр}$ з d and $(m - d - 1)$ degrees of freedom is found. If $F > F_{кр}$, it indicates the adequacy of the constructed model. If the model is not adequate, it is necessary to return to the stage of construction of the model and possibly introduce additional factors or go to the nonlinear model.

Stage 5. Checking the significance of the coefficients of the regression equation. The checking is done with help of t-statistics, which, for the parameters of a multiple regression, is (Marmoza, 2013):

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$$t_h = \frac{a_h}{\sigma^2_{a_h}}, \tag{10}$$

where σ_{a_h} – the mean square deviation of the estimation of the h parameter.

If the value t_h exceeds the critical value, i. e. it is behind the tables of the t-criterion of Student, the corresponding parameter is statistically significant and has a significant impact on the generalizing indicator.

Stage 6. Calculating the elasticity factor. Differences in units of measurement of factors are eliminated by using partial elasticity factors given by the ratio:

$$\varepsilon_h = \frac{\partial \hat{y}}{\partial x_h} \cdot \frac{\overline{x}_h}{\overline{y}}, \tag{11}$$

where x_h – the average value of the *h*-parameter; $\overline{y}$ – average value of the result sign.

Partial coefficient of elasticity ε_h indicates how much percentage of the average change of the resultant variable with a change of 1 % of the factor x_h with a fixed value of other parameters.

Stage 7. Determining confidence intervals for regression parameters. Trust interval at level of reliability (1-α) is an interval with randomly defined limits with confidence level (1-α) that covers the true value of the coefficient of the regression equation a_h and is given by dependencies (1 α) (1 α) (Marmoza, 2013):

$$(a_h - t_{\alpha/2,z}\sigma^2_{ah}; a_h + t_{\alpha/2,z}\sigma^2_{ah}), \tag{12}$$

where $t_{\alpha/2,z}$ – the Student statistics with $z = m - d - 1$ degrees of freedom and levels of significance α; σ^2_{ah} – quantum deviation of parameter estimation a_h.

If there are s random variables $x_1, x_2, \ldots, x_r, \ldots, x_s$ (the parameters being studied) represented by samples v values $x_r = \{x_{r1}, x_{r2}, \ldots, x_{rz}, \ldots, x_{rv}\}$. For each pair of random variables x_r and x_w the equation can be used to estimate the value of the empirical linear correlation coefficient r_{rw}. The obtained values of the coefficients are written in the matrix in size $s \times s$:

$$\begin{pmatrix} 1 & r_{12} & \ldots & r_{1w} & \ldots & r_{1s} \\ r_{21} & 1 & \ldots & r_{2w} & \ldots & r_{2s} \\ \ldots & \ldots & \ldots & \ldots & \ldots & \ldots \\ r_{r1} & r_{r2} & \ldots & 1 & \ldots & r_{rs} \\ \ldots & \ldots & \ldots & \ldots & \ldots & \ldots \\ r_{s1} & r_{s2} & \ldots & r_{sw} & \ldots & 1 \end{pmatrix}. \tag{13}$$

All values of the correlation coefficient r belong to the interval from -1 to 1. The sign of the coefficient shows the "direction" of the connection: the positive value indicates the "direct" connection, the negative value - the "reverse" connection, and the value "0" – the absence linear correlation communication. If r =1 or r =-1, there is a functional connection between the signs. The multiple coefficient of correlation is the main characteristic of the tightness of the relationship between the result sign PI_1 and a combination of factor signs $PI_2, PI_3, \ldots, PI_p$. When assessing the strength of the connection, the Schedule of Chaddock is used.

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3. Research Findings

Using a multivariate correlation-regression analysis, a model of net profit dependence from the main types of cost was constructed. The output data for calculating the model for PJSC Kyivstar are shown in Table 3.

To evaluate strength impact factors on the net profit presented in Table 3, a linear dependence model was formed:

$$y = 6{,}15x_1 + 27{,}00x_2 – 2{,}49x_3 – 0{,}30x_4 + 0{,}32x_5, \quad (14)$$

where y – net profit, thousand UAH;
x_1 – labour costs, thousand UAH;
x_2 – costs for social events, thousand UAH;
x_3 – material costs, thousand UAH;
x_4 – depreciation costs, thousand UAH;
x_5 – other operating costs, thousand UAH.

As it can be seen from the formula (14), with the increase in labour costs and costs for social events by UAH 1 thousand, the net profit will increase accordingly by UAH 6.15 thousand and UAH 27 thousand. The human resources are explained to be the main source from which PJSC Kyivstar can increase its profits.

Table 3. The Dependence of the Net Profit on the Main Types of Expenses at PJSC Kyivstar

Year	Net Profit	Labour Costs	Costs for Social Events	Material Costs	Depreciation Costs	Other Operating Expenses
2007	3 521 899	538 038	105 962	1 820 424	1 224 125	2 034 040
2008	5 073 453	653 172	133 782	2 142 745	1 316 301	2 267 021
2009	3 685 397	777 758	157 491	2 091 274	1 453 513	2 136 650
2010	3 677 880	700 433	165 810	1 939 528	1 350 217	2 078 358
2011	3 825 346	758 346	176 289	2 569 131	1 369 142	2 154 648
2012	4 316 355	777 189	196 349	2 663 526	1 399 067	2 797 266
2013	3 843 039	707 965	198 650	2 735 931	1 517 305	3 102 557
2014	2 168 375	800 403	214 576	3 706 888	1 709 145	3 518 914
2015	2 572 679	840 032	208 300	3 347 186	1 797 057	4 301 381
2016	3 387 067	841 395	126 932	2 275 894	3 671 345	4 746 638
2017	6 168 938	990 737	152 485	2 139 190	2 255 480	5 363 954
The Regression Coefficient of the Net Profit:		6,15	27,00	-2,49	-0,30	0,32

Source: authors' own calculations using the data given by PJSC Kyivstar

With an increase in material costs and depreciation costs by UAH 1 thousand, the net profit decreases by respectively UAH 2.49 thousand and UAH 0.30 thousand, which shows that the enterprise has necessary and sufficient number of machinery and equipment to meet customer needs. When investing in new facilities – an enterprise will not get the desired economic result.

The value of the multiplier correlation coefficient for this model is 0.99, which suggests that there is a very strong connection between the factor and the result signs. According to the Fisher's criterion, the model is also

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statistically significant, since its calculated value of 66.75 is significantly higher than the table one under the level of significance Alpha = 0.05 and the number of degrees of freedom 6 and 4 – 6.16.

A similar situation is observed considering PJSC Vodafon. The output data for calculating the dependence of the net profit on the main types of expenses for the elements is shown in Table 4.

In order to assess the influence of factors on the net profit shown in Table. 4, a linear dependence model was formed:

$$y = 3{,}37x_1 + 25{,}45x_2 – 0{,}43x_3 – 0{,}25x_4 – 0{,}36x_5, \quad (15)$$

where y – net profit, thousand UAH;
x1 – labour costs, thousand UAH;
x2 – costs for social events, thousand UAH;
x3 – material costs, thousand UAH;
x4 – depreciation costs, thousand UAH;
x5 – other operating costs, thousand UAH.

Table 4. The Dependence of the Net Profit on the Main Types of Expenses at PJSC Vodafone Ukraine

ear	Net Profit	Labour Costs	Costs for Social Events	Material Costs	Depreciation Costs	Other Operating Expenses
2007	1 724 578	238 420	64 581	2 332 450	1 393 988	1 516 936
2008	1 514 108	273 595	74 988	2 742 772	1 983 677	1 865 004
2009	1 342 256	291 548	85 761	2 578 146	2 293 012	1 532 450
2010	1 178 119	312 461	98 117	2 798 431	2 546 378	1 498 730
2011	1 052 825	347 291	112 891	2 802 558	2 864 017	1 456 344
2012	2 268 388	419 480	104 397	2 772 332	2 174 890	1 408 661
2013	2 708 271	453 313	134 780	2 830 760	1 974 176	1 447 801
2014	2 578 371	502 569	148 303	3 227 404	1 917 457	3 501 335
2015	2 422 663	542 689	165 272	3 547 174	1 791 681	3 914 072
2016	1 287 803	619 726	113 044	4 537 584	2 379 718	2 740 672
2017	2 206 463	682 692	125 879	3 847 369	2 755 761	2 377 369
The Regression Coefficient of the Net Profit:		3,37	25,45	-0,43	-0,25	-0,36

Source: authors' own calculations using the data given by PJSC Vodafone Ukraine

As can be seen from formula (15), the same as with PJSC "Kyivstar", considering PJSC Vodafon, the net profit will increase with the increase of labour costs and those for social events, and it will decrease with the increase in material costs, depreciation and other operating costs. It proves the fact that at the expense of the human resources, telecommunication enterprises have a possibility to significantly increase their profits. Therefore, it is advisable for their management to apply various measures to encourage their employees in order to obtain the desired performance.

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The coefficient of multiple correlation for the model is 0.98, which suggests the presence of a very strong link between the factor and efficient features. According the Fisher's criterion, the model is also statistically significant, since its calculated value of 35.04 is considerably higher than the table one under the significance level of Alpha = 0.05 and the number of degrees of freedom 6 and 4 – 6.16.

Thus, with the help and above-mentioned linear models, telecommunication enterprises will be able to predict the change in the net profit by increasing or reducing their costs on labour and social events, changing their material costs, depreciation and other operating costs in order to, on the one hand, provide businesses with a stable yield, and on the other hand, to develop a mechanism for telecommunication enterprise crisis management, which provides for the timely determination of the availability and expediency of the development of competitive advantages.

The study found that the mobile communication market has very big prospects. It has been actively developing, giving a possibility to make a process of communication with other people the most comfortable, the quickest and the easiest, with each passing year communication becoming more and more accessible with its benefits being enjoyed by more and more people. However, the development of telecommunications services depends, to a large extent, on attracting investment. Moreover, diversification of communication services by making radical changes in existing package tariffs, roaming, providing Internet services, using innovative, progressive, and foreign approaches to effective management of telecommunications enterprises in a context of fierce competition are one of the most promising directions for further Ukraine's telecommunication sector development.

As Chesbrough notes (Chesbrough, 2003), today innovation is increasingly complex, fast, interactive, and requires the connection of external and internal knowledge bases. Therefore, telecommunication enterprises under dynamic market environment should implement enterprise anti-crisis management, which involves the obligatory introduction of innovations in order to obtain effective results of their activities and development of their competitive advantages.

As a result of our research, we recommend a mechanism for anti-crisis management of a telecommunication enterprise, which involves timely identification of the availability and feasibility of developing a competitive advantage of the enterprise (Fig. 6).

Implementation of the mechanism of anti-crisis management of a telecommunication enterprise is provided with the use of appropriate material, financial, human resource and intellectual resources that can be concentrated both at the level of the enterprise itself and attracted from the outside. With the help of the developed mechanism of anti-crisis management, telecommunication enterprises will be able to effectively develop and realise their competitive advantages through the coordination of all the interconnected factors that affect the formation of their profitability.

Conclusions

To draw a conclusion, anti-crisis management is a management aimed at preventing and eliminating negative business outcomes related to internal and external factors. During its activities, the enterprise should regularly conduct anti-crisis management, an important component of which, as it is evidenced by the research findings, is formation and development of competitive advantages. Competitive advantages are a set of innovative, technological, economic, environmental, consumer and managerial factors, through which the enterprise, during production and sale of goods and services, enjoys benefits compared to competitors.

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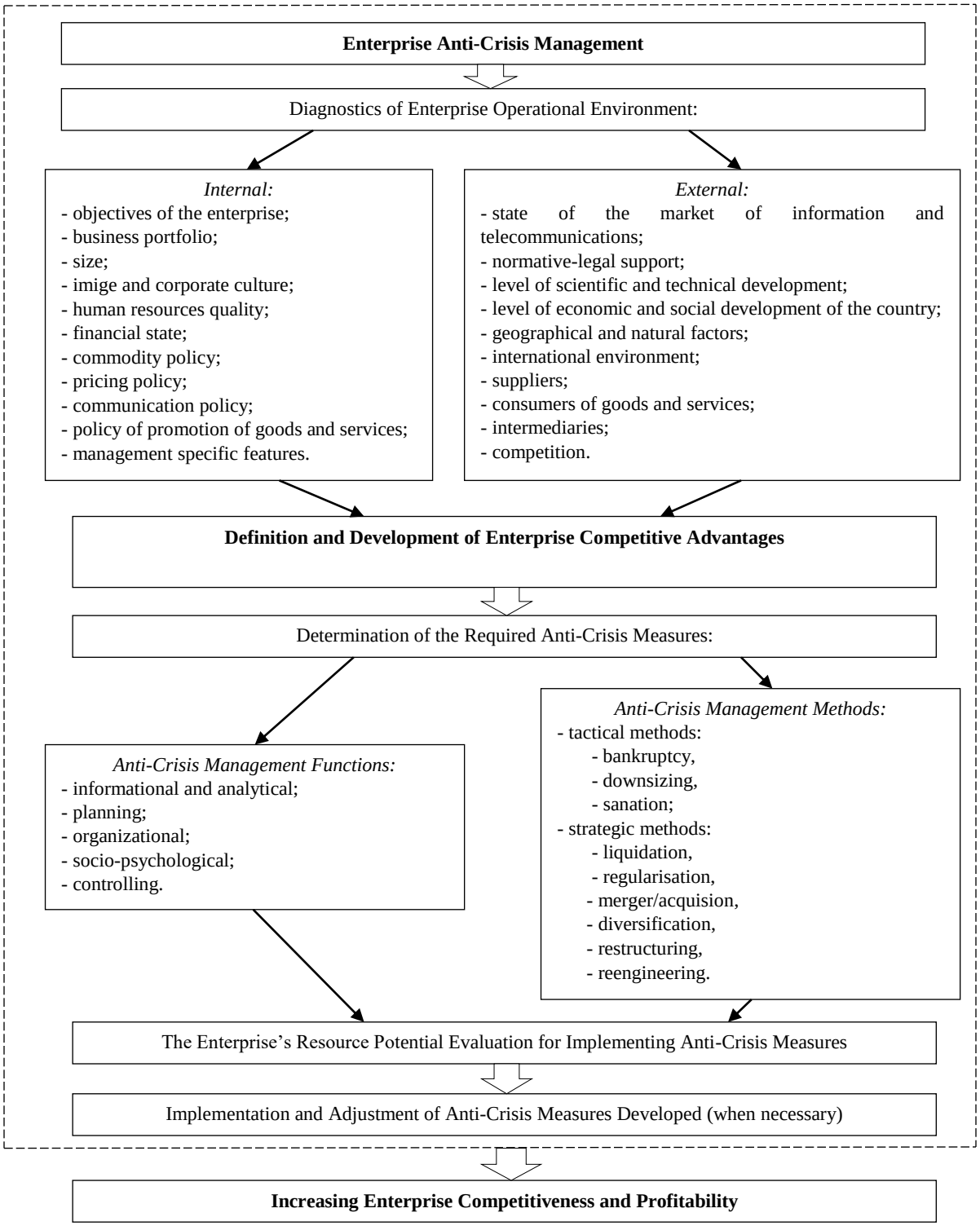

Fig.6. The Mechanism of Anti-Crisis Management of a Telecommunication Enterprise (Including the Development of Its Competitive Advantages)
Source: author's own development

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The study shows that, today, one of the priority sectors of the Ukrainian economy is the sector of information and telecommunications, from which the amount of cash receipts is annually increasing, in particular, during 2013-2017 – by 73%. However, there is a tendency towards a decrease in the number of information and telecommunications enterprises due to the presence of a large number of enterprises in the market and a high level of competitiveness. Among the services provided by telecommunication enterprises, the most widespread are mobile connection and mobile internet services. PJSC Kyivstar and PJSC Vodafone Ukraine are the leaders in providing such services on the Ukrainian market. However, the dynamism of the market is determined by the requirement for operators to continuously improve existing services and implement new ones to effectively meet the needs of users and maintain their competitive advantage. That allows characterising the mobile communication industry as rather variable, therefore, the need for enterprises to constantly implement anti-crisis management is appropriate.

With the help of the constructed model of the dependence of net profit on the main types of expenses, telecommunication enterprises will be able to predict the change in the value of their net profit, to influence its level, regulating the value of a factor that will promote the development of competitive advantages of the enterprise. The proposed mechanism of anti-crisis management of a telecommunication enterprise is characterised by being easy to use, with access to available information for anti-crisis measures and the ability to determine the availability and feasibility of developing a competitive advantage of an enterprise. Thus, the recommendations, following from the research, allows enterprises to ensure their competitiveness and identify ways to increase their profitability.

References

Aleksandrov, G.A. 2010. Crisis Management: theory, practice, infrastructure. Moscow. 544 p. (in Russian)

Azoev, H. L.; Chelenkov, A. P. 2000. Competitive Advantage of a Firm. Moscow. 255 p. (in Russian)

Baikovs, A.; Zariņš, I. 2013. Philosophical, legal and general issues of legal liability, *Entrepreneurship and Sustainability Issues* 1(1): 23–36. Retrieved from: http://dx.doi.org/10.9770/jesi.2013.1.1(3)

Baikovs, A.; Zariņš, I. 2013. Philosophical, legal and general issues of legal liability, *Entrepreneurship and Sustainability Issues* 1(1): 23–36. Retrieved from: http://dx.doi.org/10.9770/jesi.2013.1.1(3)

Baldin, K.V.; Bystrov, O.F.; Rukosuev, A.V. 2011. Crisis Management: macro-and micro-level. Moscow. 316 p. (in Russian)

Bragg, S. M. 2012. Financial Analysis: a controller's guide. Wiley. 416 p.

Brauer, M. F. 2013. The effects of short-term and long-term oriented managerial behaviour on medium-term financial performance: longitudinal evidence from Europe, *Journal of Business Economics and Management* 14(2): 386–402. Retrieved from: https://doi.org/10.3846/16111699.2012.703965

Campbell, D.; Stonehouse, G.; Houston, B. 2003. Business Strategy: an Introduction. Butterworth Heinemann. 478 p.

Chesbrough, H. 2003. Open Innovation: The New Imperative for Creating and Profiting from Technology. Boston: Harvard Business School Press. 227 p. Retrieved from: https://www.nmit.edu.my/wp-content/uploads/2017/10/Open-Innovation-the-New-Imperative-for-Creating-and-Profiting-from-Technology.pdf

De Pamphilis, D. M. 2010. Mergers, Acquisitions, and Other Restructuring Activities: An integrated approach to process, tools, cases, and solutions. Burlington: Academic Press. 751 p. Retrieved from: https://books.google.com.ua/books?hl=en&lr=&id=DRtQaFrC4q4C&oi=fnd&pg=PP1&ots=5eHFuO25af&sig=IC8-_buQpH_3gzO87hd4YLupgJY&redir_esc=y#v=onepage&q&f=false

Garškaitė-Milvydienė, K. 2014. Anti-crisis management of enterprises and possibilities of overcoming their critical condition, *Entrepreneurship and Sustainability Issues* 1(4): 187–203. Retrieved from: http://dx.doi.org/10.9770/jesi.2014.1.4(1)

Goodhart, C. A. E. 2006. A framework for assessing financial stability? *Journal of Banking & Finance* 30(12): 3415–3422. Retrieved from: http://www.sciencedirect.com/science/article/pii/S0378-4266(06)00126-9

Grant, W. N. 2003. Corporate Bankruptcy. Tools, Strategies and Alternatives. John Wiley & Sons, Inc., Hoboken, New Jersey. 280 p.

Halytska, E.V.; Kovtun, N.V. 2012. Financial Statistics: a reference book. Kyiv. 440 p. (in Ukrainian)

Horkavyi, V. K. 2012. Statistics: a reference book. Kyiv. 608 p. (in Ukrainian)

Husarov, V.M. 2002. Statistics: a reference book. Moscow. 463 p. (in Russian)

Jankelová, N.; Jankurová, A.; Beňová, M.; Skorková Z. 2018. Security of the business organizations as a result of the economic crisis, *Entrepreneurship and Sustainability Issues* 5(3): 659-671. http://doi.org/10.9770/jesi.2018.5.3(18)

Khandiy, O.O. 2012. Anti-crisis instruments of enterprise management: practical aspects of realization. *Marketing and Management of Innovations* 4: 186-192. Retrieved from: http://mmi.fem.sumdu.edu.ua/sites/default/files/mmi2012_4_186_192.pdf (in Ukrainian)

Korotkova, E. M. 2009. Crisis Management. Moscow. 620 p. (in Russian)

Lambin, J.-J.; Chumpitaz, R.; Schuiling, I. 2007. Market-Driven Management: Strategic and Operational Marketing. 2nd Edition. Basingstoke; New York: Palgrave Macmillan. 516 p. Retrieved from: https://books.google.be/books?hl=en&lr=&id=c5ccBQAAQBAJ&oi=fnd&pg=PP1&ots=8_l73Rx5Bc&sig=-IPDIAsn6gw_5Ws9sZWUbQBaKhU#v=onepage&q&f=false

Larionova, I.K. 2016. Anti-Crisis Management. Kyiv. 362 p. (in Ukrainian)

Laužikas, M.; Krasauskas, A. 2013. Impacts of sustainable structural growth on the economic performance of listed companies, *Entrepreneurship and Sustainability Issues* 1(2): 81–91. Retrieved from: http://dx.doi.org/10.9770/jesi.2013.1.2(2)

Lihonenko L.O., 2005. Enterprise under globalization: awareness of new realities. *Problems and prospects of entrepreneurship development in Ukraine: collection of scientific papers.* Kyiv: Kyiv National University of Trade and Economics, 310. (in Ukrainian)

Marmoza, A.T. 2013. Theory of Statistics: a manual. Kyiv. 592 p. (in Ukrainian)

Mazurenko, V.P. 2006. Theory of Statistics: a reference book. Kyiv. 232 p. (in Ukrainian)

Pestun, I. V.; Mnushko, Z. M.; Presniakova, V. V. 2007. Marketing informational support of the process of making management decisions in pharmacy, *Farmatsevtychnyi zhurnal* 1: 9–14. (in Ukrainian)

Porter, M. E. 1985. The Competitive Advantage: Creating and Sustaining Superior Performance. New York: Free Press. 557 p.

Private Joint Stock Company Kyivstar. Financial and analytic information. Retrieved from: https://kyivstar.ua/uk/mm.

Private Joint Stock Company Vodafone Ukraine. Financial results. Retrieved from: https://www.vodafone.ua/uk.

Sakalas, A.; Virbickaite, R. 2011. Construct of the Model of Crisis Situation Diagnosis in a Company, *Inzinerine Ekonomika-Engineering Economics* 22(3): 255–261. Retrieved from: http://www.inzeko.ktu.lt/index.php/EE/article/download/11751/6416

Senchenko, V. V.; Hladkov, O. V. 2016. Monitoring the development of the information society in Ukraine, *Science and Science of Science* 1: 16-27. Retrieved from: http://dspace.nbuv.gov.ua/bitstream/handle/123456789/132217/02-Senchenko.pdf?sequence=1 (in Ukrainian)

Shekhovtseva, L.S. 2001. Competitiveness of the region: factors and method of creation, *Marketing in Russia and abroad* 4(24): 11–16. Retrieved from: https://www.cfin.ru/press/marketing/2001-4/03.shtml

State Statistics Service of Ukraine, 2018. Activity of large, medium, small and micro-enterepreneurship entities. Statistical publication. Kyiv: State Statistics Service of Ukraine. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_dsp_2017.pdf

State Statistics Service of Ukraine, 2018. Retrieved from: http://www.ukrstat.gov. ua/

Tarasenko, T.O. 2006. Statistics: a reference book. Kyiv. 344 p. (in Ukrainian)

Vasylenko, V. O. 2005. Enterprise Anti-Crisis Management: a manual. Kyiv. 208 p. (in Ukrainian)

Vasylenko, V.O.; Tkachenko, T.I. 2004. Strategic Management of the Enterprise: a manual. Kyiv. 400 p. (in Ukrainian)

Verkhovna Rada of Ukraine. 2007. Law of Ukraine No 537-V: On the Basic Principles for the Development of an Information-Oriented Society in Ukraine for 2007–2015, Kyiw, Ukraine. Retrieved from: https://zakon.rada.gov.ua/laws/show/537-16

Wahl, M.; Prause, G. 2013. Toward understanding resources, competencies, and capabilities: business model generation approach, *Entrepreneurship and Sustainability Issues* 1(2): 67–80. Retrieved from: http://dx.doi.org/10.9770/jesi.2013.1.2(1)

Yatskevych I. V. 2010. Organizational and economic forms of interaction of small and large enterprises in the telecommunication sector: a monograph. Odesa. 216 p. Retrieved from: http://www.dut.edu.ua/uploads/l_53_47692056.pdf

Zagorulko, V.; Zubko, L.; Sapeha, Ya. 2015. Analysis of competitionin the mobile market in Ukraine, *Economics. Management. Business* 2 (12): 33-40. Retrieved from: http://nbuv.gov.ua/UJRN/ecmebi_2015_2_7

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CORPORATE AGREEMENT AS A MEANS OF PROVIDING SECURITY IN THE COURSE OF ENTREPRENEURSHIP DEVELOPMENT*

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Abstract. A corporate agreement has become necessary for entrepreneurship development in Russia in connection with the need of participants of associations to regulate the emerging corporate relationships within the organization in the area of corporate governance and business administration. However, the decade-long experience of implementation of regulations relating to corporate agreements has posed plenty of questions, in particular, about the legal nature of corporate agreements, their scope of validity, and the liability of associations to counteragents for failure to perform their obligations due to limitations set by a corporate agreement. Therefore, the objective of this paper is to explore the legal nature and contents of the corporate agreement as a means of providing security in the course of entrepreneurship development based on analysis of court practice and reception of regulations relating to corporate agreements from foreign legal systems. The conducted research has shown that the subject field and scope of the corporate agreement are not imperatively prescribed by law. The corporate agreement in the Russian legislation has adopted general features of legal regulation common in continental Europe, whereas the contents were borrowed from the Anglo-Saxon law.

Keywords: corporate agreement; administration of legal entities; entrepreneurship; liability

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1. Introduction

The legislative framework for the institution of corporate agreement in the Russian legal system was established relatively recently, namely in 2014, when the Civil Code of the Russian Federation (CC RF) was supplemented with Article 67.2 regulating conclusion of such agreements. However, in spite of the absence of direct legislative regulation on the part of the state before the adoption of this article, corporate agreements had been employed by

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legal entities, when participants of large corporations tried to use this mechanism to solve internal conflicts of interest and organize effective and coordinated business administration led by the example of other countries. In particular, the institution of corporate agreements was widely used when organizations with the participation of foreign companies emerged in the Russian legal environment, which allowed them to apply foreign norms to the corporate relationships between participants and shareholders of such organizations in order to settle issues arising in the course of business administration.

At first, the court practice did not deem corporate or shareholders' agreements effective and generally treated them negatively. Large judicial proceedings in respect to shareholders' agreements concluded by CJSC Russian Standard Insurance and PJSC Megafon, which were regulated by foreign legal norms and ruled invalid by the court, were widely discussed in the media. As far as legal proceedings in respect to PJSC Megafon are concerned, participants of this legal entity had made a corporate agreement governed by the law of a foreign state and covering such areas as election and approval of the members of the board of directors, conditions and sequence of actions if a shareholder decided to dispose of a part or the full amount of shares belonging to them. The court hearing the case came to the conclusion that shareholders' agreements should be governed by the Russian law and charter documents of the corresponding entity rather than by foreign regulations. In the case of CJSC Russian Standard Insurance, the company's shareholders included the following provisions in the shareholders' agreement: as in the previous example, the procedure for holding general meetings and voting, as well as the conditions of how shareholders should make their contributions to the charter capital; at the same time the parties agreed on procedures different from those prescribed by the law. According to courts, such agreements, like many other agreements based on foreign regulations, were in direct contradiction to the legislation of the Russian Federation (The Resolution of the Federal Arbitration Court of the Western-Siberian region of 31 March 2006 no. F04–2109/2005 (14105-A75-11), ruling // The document has not been published. URL: http://www.consultant.ru (date of access: 01.12.2018); the Resolution of Moscow Arbitration Court of 26 December 2006 in respect to the case no. A40-62048/06-81-343 // The document has not been published. URL: http://www.consultant.ru (date of access: 01.12.2018). It should be mentioned that the courts noted that shareholders' agreements within certain organizations were acceptable only in terms of issues connected with the establishment of an association. In other words, in spite of the attempts made by legal entities to introduce corporate agreements into the business practices of the Russian legal system, at that moment, courts acknowledged the possibility of concluding only constituent agreements by shareholders. The above-mentioned decisions provided the basis for the adoption of corresponding amendments to several laws of the Russian Federation and encouraged recognition of the new legal institution and establishment of its legislative framework.

Therefore, the institution of the corporate agreement is meant to regulate the process of corporate governance in order to create favorable conditions for effective entrepreneurship and develop clearer and more flexible procedures for each individual case allowing the participants to exercise their rights and establishing certain liabilities for parties of the agreement, which encourages stability of civil circulation. However, even after the adoption of amendments to the federal laws of the Russian Federation no. 208-FZ of 26 December 1995 "On joint-stock companies" ("On JSC") and no. 14-FZ of 8 February 1998 "On limited liability companies" ("On LLC") and after the introduction of a separate article into the CC RF devoted to the corporate agreement, there is still no unequivocal position in the legal sphere regarding the legal force, essence and other issues connected with this legal category. Up to now, court practice remains uncoordinated when it comes to specific categories of disputes arising from corporate agreements made by participants of an association or shareholders. In addition, up until now, the Supreme Court of the Russian Federation has not expressed a unified position on this topic or issued an explanatory information letter; the Plenum of the Supreme Court has not published any resolutions that would work towards a single interpretation of the law and regulations governing the legal institution that constitutes the subject matter of this research. In this connection, in the course of business activities, legal entities often face problems leading to destabilization of civil circulation in general, affecting investment appeal and the chances of conducting safe business operations in Russia in particular.

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2. Literature Review

Research papers written by Abramov et al. (2010), Ardalan et al. (20170; Pruner da Silva et al. (2018), Sitdikova et al. (2018) are devoted to the issues and specific features of transactions made by corporate legal entities. As far as liability for failure to perform one's obligations under corporate agreements is concerned, we studied papers by LeRoy and Redfern (1947), Baglion (2008). The issues of essence and scope of corporate agreements are discussed in the papers by Aliev (2015), Andreev (2014), Borodkin (2014) and Leus (2016). Papers devoted to the comparative analysis of the institution of corporate agreement in Russia and other countries by Masaev (2015) and Varyushin (2015) were used in this article as well.

In order to explore the legal category of corporate agreements, their essence and characteristics, we are going to analyze the legislation of the Russian Federation and mainly countries with the Anglo-Saxon legal system, as well as the existing court practice in respect to the performance of obligations by legal entities.

3. Methods

In the research, we used general scientific and specific legal methods of obtaining knowledge: the historical-legal, technical-legal, comparative-legal and sociological methods. The methodology of structured systems became the main research approach that allowed us to identify the legal nature and scope of corporate agreements.

The combination of historical-legal and comparative-legal methods helped to understand the specific features of the ways, in which historic environment influenced the development of corporate agreement institution and the impact of the Anglo-Saxon legal system on its evolution in Russia.

The technical-legal method allowed us to analyze legal norms regulating the legal nature of corporate agreements, identify their characteristics and substantiate proposals aimed at improvement of legislation towards stable development of entrepreneurship in Russia.

Based on the sociological method, we made conclusions, suggestions and recommendations aimed at legal consolidation of penalties for violations of terms set forth in corporate agreements.

4. Results

It has been established that corporate agreements are concluded so that their parties can achieve the common goal — competent and effective management of a business association or corporation and achievement of the best possible result of its operation, which reflects the long-term nature of such agreement. The document under consideration can be characterized as supportive since at the moment when it is concluded, its parties make provisions for the sequence and algorithms of their actions aimed at management of the association.

It has been found that when defining the scope of the corporate agreement at the moment of its conclusion, the parties should be guided by the principles of good faith and autonomy of will, as well as current mandatory statutory provisions.

We have identified the necessity to introduce the norm stipulating the possibility of applying for compensation as liability for infringement of the terms of the corporate agreement into Article 67.2 as a means allowing to restore

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the infringed right without any risks for the non-breaching party. Besides, it should be specified in this norm that if the amount agreed by the parties as compensation for infringement of the terms of corporate agreement turns out to be lower than the losses incurred to the other party, the damaged party has a right to claim indemnification for the losses reduced by the compensation paid under the agreement.

We suppose that it is reasonable to introduce the mechanism of issuing an injunction if one of the parties of a corporate agreement commits certain actions that, according to the claiming party, can lead to infringement of the terms of the agreement and future losses that can be potentially incurred to the association. The concept of the injunction is common in the American law and can be used as one of the possible ways to protect the rights of the parties of a corporate agreement and those of the association itself in the course of business activities regulated by the corporate agreement. In our opinion, this mechanism will encourage compliance with the terms of the corporate agreement provided by all of its parties, while timely measures will allow the business association to avoid possible losses connected with breaches of arrangements set forth in the corporate agreement.

5. Discussion

As economy and law evolved, while business connections and legal relations developed, it became evident that there was a necessity of introduction of a corporate or shareholders' agreement as one of the regulators of internal corporate relationships within organizations, which would allow to coordinate the process of performing obligations and exercising the rights belonging to participants of corresponding associations in greater detail, as opposed to charter documents, which already existed at that time (Sitdikova, Starodumova, Shilovskaya 2017). As M.V. Leus notes, corporate agreements to the full extent encourage disclosure and consideration of the unique and specific character of the corporate law and corporate relationships arising in organizations. In addition, they allow expanding the scope of rights and powers of its parties, i.e. participants of business associations (Leus 2016).

Having realized that reception of the institution of corporate agreements from foreign law and wide spread of such agreements in the civil circulation between legal entities are inevitable, the Russian legislative body introduced the concepts of agreement on the exercise of the rights of participants of associations and shareholders' agreement into legislation, the essence of which is by and large the same: providing participants of associations with the right to choose the patterns of internal interactions between each other on their own, as well as the mechanism of exercising their outward rights and obligations resulting from the activities conducted by the association and the process of their administration.

The purpose of legal consolidation of corporate agreements was an attempt to equalize the positions of different shareholders in a joint stock company, including minority shareholders. Apart from this goal, a shareholders' agreement was meant to become one of the instruments for the protection of minority shareholders' interests and rights and allow them to take part in corporate governance. In his work, I.A. Masaev notes that in fact, corporate agreements can expand the scope of rights and responsibilities of a participant of association if they express a wish to become a party to such an agreement (Masaev 2015). The supporters of adoption of new norms that would provide legislative regulation of corporate agreements, which were already widely used, among other things, were guided by the necessity to specify the liability of parties for infringement of their terms. As we can see today, this task has not been achieved, since up until now, the norms relating to corporate agreements are superficial: they do not specify important fundamental issues or address the issues of liability, contracting parties and scope of such agreements. Therefore, a conclusion can be made that the Russian law is just at the outset of the way to effective regulation of corporate agreements.

The impetus to the legislative development of the corporate agreement institution can be associated with the decisions on the two most resonant court cases, involving CJSC Russian Standard Insurance and PJSC Megafon, which we mentioned earlier. Let us turn to the corporate conflict regarding the former organization. On May 30,

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2003, the LLC "Russian Standard-Invest", the company "Cardiff S.A." (France) and Mr Rustam Tariko signed a shareholders agreement concerning the CJSC Russian Standard Insurance. The CJSC Russian Standard Insurance was established on March 25, 2003 by the sole founder of the LLC "Russian Standard-Invest".

The signed agreement, first, concerned the CJSC Russian Standard Insurance but didn't involve its participation. Second, it extended its effect to all shareholders of the company (both present and future) and throughout the existence of this company. It regulated the procedure for creating an already established legal entity, as well as the issues of its legal capacity, the procedure for paying in authorized capital, the structure and basic principles of management, conditions for the procedure for distributing profits, conditions for exercising the pre-emptive right to repurchase shares, the procedure for determining the market value of shares. In addition to this, the parties subordinated the agreement to the action of the law of England, even though Russian law expressly prohibited such conditions regarding a Russian legal entity. Collisions also arose with respect to such terms of the agreement as limiting the company's activities, establishing uncertainty regarding the decision-making procedure of the management bodies, for example, by obliging the company to place additional shares in favor of Cardiff S.A. at its request. The most serious violation of the agreement, which is currently directly contained in the legislation, was that the agreement established a priority action over the charter of the company. This aspect will be considered by us a later. As a result, the corporate contract was invalidated.

Whereas before the adoption of the federal laws "On JSC" and "On LLC" regarding shareholders' agreements and agreements on the exercise of the rights of participants of associations courts treated such arrangements between participants of associations negatively and often ruled them invalid, after the introduction of the above-mentioned norms in 2008–2009 the attitude of courts to this legal institution has changed. For instance, the Arbitration Court of the Samara region held alienation of shares owned by a shareholder valid due to the implementation of bankruptcy and insolvency proceedings in respect to this shareholder (the Resolution of Moscow Arbitration Court of 30 December 2010 in respect to the case no. A55-24220/2010. (Case file of the Supreme Arbitration Court. URL: http://kad.arbitr.ru (date of access: 20.11.2018)). In the case under examination, the shareholders of the company had entered in a corporate agreement, whereby they agreed that if bankruptcy and insolvency proceedings were implemented in respect to any party to this agreement, any shareholder, who was also a participant of the same agreement, would have the right to request alienation of shares belonging to the shareholder in question in their own favor or in favor of all parties in a proportionate manner. The court found that this provision did not contradict either specific norms contained in the above-mentioned laws or the norms of the civil legislation in general and upheld the plaintiff's claim.

After the introduction of amendments to the federal laws, preparation for the introduction of corresponding amendments to the CC RF started; therefore, Article 67.2 of the CC RF was adopted in 2014. It immediately addresses the institution of corporate agreements and has partially eliminated the gaps in the regulation of corporate agreements that existed before its adoption, but at the same time gave rise to new disputes and questions. For example, though not explicitly, Article 67.2 allows to draw a conclusion that a corporate agreement in itself is neither a document that creates new legal standards, i.e. it can't be called a local regulatory legal act, or one of internal documents of an organization whose legal force can be stronger than that of articles of association. A corporate agreement can change or supplement only non-mandatory provisions of the law while staying well within mandatory statutory provisions and charter documents of the association.

In order to understand the place of the corporate agreement in the Russian legal system, we identified the fundamental terms that guarantee that the agreement is deemed to be concluded and is held valid (according to clause 1 of Article 432 of the CC RF):

1) terms covering the subject matter of the agreement;
2) terms mentioned in the law as essential for this type of agreements;

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3) terms with respect to which, in the opinion of the parties, a consensus should be reached.

Many theorists point out the fact that the legal nature of corporate agreements is somewhat different from that typical of classic civil law contracts, which is reflected in a few issues, including their subject matter (Andreev 2014). Other specialists in civil law, such as E.N. Abramova, recognize a specific aspect or object, in respect to which parties to the contract have certain legal rights and responsibilities, as the subject matter of a civil law contract (Abramova et al. 2010).

Considering the concept of corporate agreements, it is difficult to give a straight answer to what should be understood as their subject matter. However, it can be definitely concluded that none of the above-mentioned definitions or existing points of view regarding the subject matter of classic contracts can be used when speaking about corporate agreements.

According to the federal law no. 99-FZ of 5 May 2014 (as amended on 03 July 2016) "On amendments to chapter IV of part I of the CC RF and the annulment of certain provisions of legislative acts of the Russian Federation", a corporate agreement is defined as an agreement between participants of a business association on the realization of their rights, in accordance with which they undertake to exercise these rights in a certain manner or to abstain from exercising them. Besides, it is pointed out that parties to such an agreement can establish the voting procedure in a general meeting, commit in a coordinated manner the other actions whereby the association is managed, acquire or alienate stakes in its charter capital at a price determined by such an agreement or upon the onset of specific circumstances or abstain from usage of the above-mentioned powers until the onset of specific circumstances.

By taking a closer look at clause 1 of Article 67.2 of the CC RF, one can come to the firm conclusion that the subject matter of corporate agreements concluded by participants or shareholders of corresponding business associations involves neither certain actions or inaction, things, operating results or services, but rather certain procedures for the exercise of rights possessed to participants of such association or abstaining from implementation of such rights. Thus, a corporate agreement does not establish which actions have to be performed by its parties — such agreements are concluded with respect to a particular material thing or work (service). Rather, a corporate agreement specifies how exactly, as opposed to the commonly accepted and default non-mandatory provisions of the law, its participants shall exercise their rights: how they should vote, in which cases they should abstain from voting, which decisions and under which conditions they can make, which deals to conclude etc. Essentially, a corporate agreement is meant to individualize the procedures for the exercise of rights in a business association and, accordingly, the procedures for its governance.

The current legislation does not address the contents of corporate agreements: analysis of Article 67.2 of the CC RF, Article 32.1 of the federal law "On JSC" and Article 8 of the federal law "On LLC" shows that this issue is not reflected in the law. Relying on the fact of absence of regulation of the contents of the agreements under consideration, most theorists have come to the conclusion that presently, the general rule implies that parties can include any provisions in their corporate agreement as long as it follows the condition outlined in clause 2 of Article 67.2 of the CC RF that imposes restrictions on their rights and responsibilities. According to this clause, a corporate agreement cannot impose an obligation on the participants of an association to vote according to directions of the bodies of the association or to define the structure of the bodies of the association and the competence thereof. Otherwise, parties to the agreement are free to include any rights and responsibilities in the text of the agreement that they would like to introduce into their relationships in accordance with their voluntary general consensus. In other words, since legislation lacks mandatory provisions regarding acceptable conditions that can be included in a corporate agreement by its parties or the ones imposing prohibitions or a wider range of restrictions, a conclusion can be made that the basic principle of contractual freedom can be applied to corporate agreements to the full extent (Aliev 2015).

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An important issue from the perspective of the new regulation on corporate agreements introduced in the civil legislation is connected with the scope of validity of such agreements and the correlation between corporate agreements, articles of association, within which such agreement is concluded, and mandatory provisions of the civil and corporate law. Understanding the boundaries of a corporate agreement is necessary in order to defend the rights of the contracting parties from the negative consequences of incorporation of conditions therein that are either directly prohibited by the current legislation of the Russian Federation or contradict them or the contents of the articles of association.

Up until now, court practice has not yet worked out a unified position as to which provisions that are deemed contradictory to the articles of association are, therefore, recognized as void and which of them, in spite of being in direct general contradiction to the conditions and provisions of the articles of association, are still deemed valid by the court and inclusion of which into the agreement remains within the framework of the current legislation.

For instance, as a result of consideration of a case an arbitration court deemed a corporate agreement concluded by shareholders of an association void since some of its provisions contradicted and did not correlate with the federal law "On JSC" and articles of association. The parties had included provisions in the agreement changing the procedure and terms of convening the general meeting; in addition, the agreement stipulated introduction of a new governing body not mentioned in the articles of association, namely temporary administration; it also contained provisions for changing the competence of governing bodies and altering the procedure of approval of transactions made by the association. During the hearing of the case, the court of primary jurisdiction came to the conclusion that a shareholders' agreement by its nature cannot change or supplement the current articles of association; moreover, it cannot contradict the provisions of the federal law "On JSC" (the Resolution of the Arbitration Court of the Saratov Region of 7 September 2010 in respect to the case no. A57-7487/2010 // URL: http://www.rospravosudie.com (date of access: 15.10.2018).

Within another dispute of interest, the plaintiff requested the court to hold invalid the provisions included in the text of corporate agreement regarding the voting procedure in the general meeting, according to which the parties assumed the obligation to vote unanimously for certain items on the agenda. The plaintiff substantiated his request by saying that, in his opinion, these provisions were in direct contradiction to mandatory regulations in respect to the shareholders' or participants' of an association right to vote in a general meeting at their own discretion. Courts of three jurisdictions found lawful the inclusion of such provisions in the text of a corporate agreement and identified no grounds for holding them invalid or contradicting the mandatory regulations of the current legislation of the Russian Federation (the Resolution of the Federal Arbitration Court of the Western-Siberian region of 20 March 2014 in respect to the case no. A45-1845/2013 // The document has not been published. URL: http://www.consultant.ru (date of access: 17.10.2018).

A logical conclusion can be drawn that, in spite of the specific sphere of application of corporate agreements, they are subject to the general rule that mandatory norms contained in laws and regulations shall prevail in the case of their legislative consolidation.

Having conducted comparative legal research into the established regulation of the institution of corporate agreement and shareholders' agreement, which are identical concepts by their nature, in the legal framework of the Anglo-Saxon countries, continental Europe and the Russian Federation, we have come to interesting conclusions caused by the so-called double reception of the legal category under examination. The Russian legislation generally adopts the experience of European neighbors, so in the sphere of regulation of corporate agreements, there are lots of similarities with the regulations established in European countries. However, it should be taken into account that corporate agreements and the practices of the conclusion of any internal agreements between shareholders and participants of an association originated from the Anglo-Saxon legal

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system, where this legal institution first appeared. Consequently, by borrowing provisions on corporate agreements developed in continental Europe over time, the Russian legislation could have adopted some features typical of the statutory regulation of the institution of shareholders' agreements in the countries with the Anglo-Saxon legal system. For example, as corporate law and the sphere of internal corporate regulations evolved in Russia, in the practice of conclusion of written agreements between shareholders and participants of corresponding associations such typical features of the Anglo-Saxon model of shareholders' agreements started to emerge as deadlock provisions and clauses on preferential right to purchase a share in a company, its part or stocks belonging to a participant of a legal entity. It should be noted that instead of including such provisions in the text of corporate agreements, parties to such agreements increasingly tend to distinguish certain types of such provisions depending on the application of the pre-emption right and on the party willing to purchase a share of the business, like in Anglo-Saxon countries. Interestingly, the actual reception of this institution was based on the model spread in European countries with features of legal regulation of corporate agreements commonly found in continental Europe, while as far as their contents are concerned, the Russian law has followed the Anglo-Saxon model.

The first references to corporate agreements in the Anglo-Saxon legal framework, or, to be more precise, to one of the types of such agreements, go back to the 1840s and first appeared in resolutions of English courts. As M.S. Varyushin notes, corporate agreements of that time, called shareholders' agreements in the countries with the Anglo-Saxon legal system, were different from those widely used by legal entities nowadays, since they constituted not an agreement between participants of a company, but rather a memorandum of a joint-stock partnership, which included such provisions as the amount of the charter capital and the size of dividends annually distributed among the participants (Varyushin 2015). Later the English law started to differentiate between the relations between the company itself and its participants (shareholders), which are of corporate nature and are regulated by charter documents of the organization, on the one hand, and the relations between participants of the organization, which have become predominantly of binding character, on the other hand.

The period when corporate agreements appeared in the USA coincided with similar business realities in England and took place in the 1850s. At that time the following legal concepts emerged and were consolidated in the court practice of the USA: voting agreements, pooling agreements and shareholders' agreements. For example, when one of the cases was reviewed by an American federal court, it was determined that in spite of the existing prohibition on making changes to mandatory norms and standards of corporate governance, the conclusion of an agreement between shareholders in respect to the exercise of their voting right resulting from the owned shares and expressed in the choice of certain candidates to enter the board of directors would not be considered a violation and would be accepted as valid (LeRoy, Redfern 1947).

Basically, corporate agreements are understood by the English law as contracts concluded either between all or some of the shareholders or between shareholders and the company (Masaev 2015). In England, apart from various judicial precedents, shareholders' agreements are regulated by the Companies Act 2006.

As previously noted, in European countries or, to be more precise, in countries with the Romano-Germanic legal system, the pre-emption right is often not recognized as an acceptable condition that can be included in a shareholders' agreement, whereas in the countries with the Anglo-Saxon legal framework provisions regarding the preferential right to purchase or sell a share in a company are among the most common ones and are recognized by court practice as valid and effective. For instance, put and call option clauses widespread in England and the Anglo-Saxon legal system, are also widely used in the Russian corporate agreement practice.

In addition, following the Anglo-Saxon model of shareholders' agreements, the Russian legal system has borrowed clauses aimed at the solution of deadlock situations by participants or shareholders of a business association. As a rule, such provisions are used when agreements are concluded by shareholders or participants of

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large companies, holding companies and corporations if stocks or shares are distributed between them in such a way that it is impossible to make a decision by voting, i.e. if one group is against the positive decision about the issue on the agenda, whereas the other group is for it, but the total shares of voices are equal, so there is no majority of votes. Speaking about establishing the liability of parties to a corporate agreement in the event of its violation by one of the parties, the Russian law has followed the model set by European countries. One of the main means of protection provided to the parties is indemnity. This measure is common not only in the sphere of regulation of corporate relationships but also in the Russian civil law in general. However, just as in many European countries with the Romano-Germanic legal system, in the Russian legal framework, the mechanism of proving and compensation for losses in respect to corporate relationships on the whole and corporate agreements, in particular, raises some questions and causes certain difficulties. Up until now, the system of proving losses suffered by one of the parties to the agreement as a result of its violation by other parties has not been fully refined, since parties often have problems establishing cause-and-effect relationships between the violation and incurred losses, including a lengthy collection of evidence.

In view of the foregoing, we believe that presently the legal category of corporate agreements is only at the beginning of its formation and establishment in the Russian legal system. In our opinion, in the future it will be subject to more thorough statutory regulation; besides, it is likely that the Supreme Court of the Russian Federation will soon provide general explanatory remarks on this topic that will allow achieving unity of opinions in the course of consideration of disputable situations.

In the Russian civil law, as it is directly specified in Article 67.2 of the CC RF, corporate agreements must be made in writing; otherwise, according to the general rule, a corporate agreement can be subject to consequences of nonadherence to the simple written form prescribed by the law for particular types of contracts. This rule can be traced back to foreign legal systems where it appeared as the institution of corporate agreements emerged and further developed. In legal systems of foreign countries the necessity of concluding such contracts in the written form is confirmed, in particular, by the Model Business Corporation Act, which represents a collection or set of regulations in the area of corporate law and has had a significant impact on this legal sphere in the USA (Borodkin 2014).

Within the legal framework of foreign countries, corporate agreements can guarantee certain rights to parties, which have to be reflected in the agreement. For example, parties can make provisions allowing shareholders to sell their shares or a part of them to a third party that can be represented by a participant of the organization or an external person. Apart from that, the agreement can include clauses on the preferential right of full or partial purchase of shares belonging to another participant of the corporation at a certain price (Baglioni 2008).

In one of the cases reviewed by V.G. Borodkin, the court directed that according to the articles of association it was necessary to offer other shareholders of the company to buy saleable shares before their actual sale. This case is of interest because the shareholder made a sale of their shares to another shareholder without offering other shareholders to buy them or notifying them of the sale. On these grounds one of the shareholders requested the court to hold the deal invalid, since in their understanding the restriction on selling shares to third parties from the perspective of the notification of the intention to sell shares belonging to other participants of the company, shall also apply to alienation of shares in favor of other participants of the legal entity. The court of appeal deemed the plaintiff's demand illegal and rejected the claim, since it considered the applicable regulations to be vague and indefinite and came to the conclusion that if participants of the company are willing to establish different ways of alienation of shares, such conditions must be unambiguously reflected in the articles of association (Borodkin 2014).

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Establishment of conditions in a corporate agreement regarding the pre-emption right can be caused by the wish to prevent the participation of third parties in the corporation or to increase the corporate legal capacity of one or several minority shareholders.

However, in practical terms, the question about the purchase price of such shares arises. In foreign countries with various legal frameworks, this issue is solved in different ways. For example, the American model of corporate agreements uses the rights of first refusal and first offer.

The practices of share price determination in the English law are of interest, because corporate agreements in this legal system can include two possible models depending on the rights provided to majority and minority shareholders: the drag-along right implies that a shareholder of an entity sells their stake, they have the right to force the remaining shareholders to join the deal and sell their shares to the same prospective owner, while the tag-along right implies that a shareholder can join in the deal between another shareholder and a third party if the former sell their shares to the latter and the terms of such transaction are favorable for the joining party (Borodkin 2014). The purchase of their shares must be made at the same terms and conditions as the initial deal. This right protects minority shareholders as the weakest participants of a corporation compared with majority shareholders. We believe that this rule should also be introduced in the legislation of the Russian Federation.

Conclusions

In the course of the research of the legal category of corporate agreements, their essence and characteristics, we have come to the conclusion that the subject matter of corporate agreements concluded by participants or shareholders of corresponding business associations involves neither certain actions or inaction, things, operating results or services, but rather certain procedures for the exercise of rights possessed to participants of such association or abstaining from implementation of such rights. Such procedures specify the exact way, in which the parties shall exercise their rights as opposed to the commonly accepted and default non-mandatory provisions of the law.

Apart from the conditions mentioned in Article 67.2 of the CC RF, the contents of a corporate agreement may include the following provisions: an option clause expressed by providing an irrevocable offer to one of participants of the association or a third party by a party to a corporate agreement to conclude a purchase and sale contract in respect to the shares owned by the initiator of the offer upon the onset of specific circumstances; a clause on pre-emption right; and deadlock provisions.

The conclusion has been drawn that if a party to a corporate agreement violates the clause that establishes the preferential right to purchase shares, the other party can demand transfer of the rights and responsibilities of the buyer to it by judicial means.

Based on the comparative analysis of the Russian law and the law of the countries with the Anglo-Saxon legal system, we have found mixed reception of the regulations regarding corporate agreements by the Russian legal framework, which makes it much harder to implement these norms in the entrepreneurial activities conducted by legal entities. In common-law countries liability is established for infringement of corporate agreements by its parties; besides, there are also some protection mechanisms in place. If a corporate legal entity acts as a party and participant of a corporate agreement, it is possible to include a provision in this document enabling the organization to prevent the shareholders from taking particular actions or not to accept their instructions that in any way contradict the concluded effective agreement. Also, the text of an agreement can contain clauses according to which articles of association can be changed only if all shareholders agree to that.

It is planned to conduct further more detailed research based on the court practice existing in Russia and other countries regarding liability for infringement of corporate agreements; in addition, such research will help to unify the legal norms of Russia and foreign countries.

References

Abramova, E.N.; Averchenko, N.N.; Baigusheva, Yu.V. et al. 2010. *Grazhdanskoe pravo*: uchebnik: v 3 t. [Civil law: textbook in 3 vol.]. Vol. 3. Edited by A.P. Sergeev. RG Press, Retrieved from http://base.garant.ru/5810594

Aliev, T.T. 2015. O sushchnosti pravovoi prirody korporativnogo dogovora [On the essence of the legal nature of the corporate agreement]. *Grazhdanskoe pravo* 1: 19–22.

Andreev, V. K. 2014. Priroda korporativnogo soglasheniya [The nature of the corporate agreement]. *Predprinimatelskoe pravo. Prilozhenie "Pravo i Biznes"* 2: 2–6.

Ardalan, F.; Almasi, N. A.; Atasheneh, M. 2017. Effects of contractor and employer's obligations in buy back contracts: case study of oil exporting country, *Entrepreneurship and Sustainability Issues* 5(2): 345-356. http://doi.org/10.9770/jesi.2017.5.2(13)

Borodkin, V.G. 2014. Predmet i soderzhanie korporativnogo dogovora v Rossii i inostrannykh pravoporyadkakh [The essence and contents of corporate agreements in the Russian and foreign legal frameworks]. *Pravo i ekonomika* 2: 39–41.

Baglioni, A. 2008 Shareholders' Agreements and Voting Power: Evidence from Italian Listed Firms (September 5, 2008). http://dx.doi.org/10.2139/ssrn.1092864

Companies Act 2006 [Electronic resource]. *The National Archives.* Retrieved from http://www.legislation.gov.uk/ukpga/2006/46/contents.

LeRoy, H.; Redfern, S. Ed. 1947. Corporations – Shareholders' voting agreement – Drafting precautions. *Michigan law review* 46(1): 70.

Leus, M.V. 2016. Istoriya stanovleniya i razvitiya pravovogo regulirovaniya korporativnogo dogovora [The history of evolvement and development of the corporate agreement]. *Obshchestvo: politika, ekonomika, pravo* 3: 125–127.

Masaev, I.A. 2015. Sravnitelnyi analiz ponyatiya "korporativnyi dogovor" v Rossii i Soedinennom Korolevstve Velikobritanii i Severnoi Irlandii [Comparative analysis of the concept of corporate agreement in Russia and the United kingdom of Great Britain and Northern Ireland]. *Pravo i sovremennye gosudarstva* 1: 63–67.

Pruner da Silva, A.L.; Lana, J.; Marcon, R. 2018. Agreeing and impacting: The effect of the shareholders' agreement on firms' market value. *Brazilian Business Review* 15(1): 88–104. http://dx.doi.org/10.15728/bbr.2018.15.1.6

Sitdikova, L.B.; Starodumova, S.J.; Volkova, M.A. 2018. Aspects of transactions by business entities in civil legislation. *European Research Studies Journal* XXI(4): 557–566. https://www.ersj.eu/dmdocuments/2018_XXI_4_45.pdf EID: 2-s2.0-85058958377

Sitdikova, L.B.; Starodumova, S.Yu.; Shilovskaya, A.L. 2017. The reforming of Russian civil legislation (from the general part of the civil code to the particurlar implementation of the norms). *Economic and social development* – Book of Proceedings Varazdin Development and Entrepreneurship Agency; Russian State Social University, 894–901. eLIBRARY ID: 30730112

Sitdikova, L.; Starodumova, S.; Volkova, M. 2018. Corporate legal entities in the civil law of the Russian Federation, E*conomic and Social Development* – Book of Proceedings, Editors: Maloletko A., Rupcic N., Baracskai Z., 715–721. eLIBRARY ID: 36390910

Varyushin, M.S. 2015. *Grazhdansko-pravovoe regulirovanie korporativnykh dogovorov: sravnitelnyi analiz* [Civil-legal regulation of corporate agreements: comparative analysis]. PhD thesis in Law: 12.00.03. Moscow.

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DIRECTIONS OF SOCIAL PARTNERSHIP OF EMPLOYERS AND UNIVERSITIES IN THE SPHERE OF ECONOMIC EDUCATION IN UKRAINE

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Abstract. The article is devoted to the analysis of the possible directions of social partnership of employers and economics universities. In order to generalize the experience of partnership in the field of vocational education, the choice of partnership approaches and the assessment of the possible benefits from partnership, there was conducted a study of employers in Ukraine. The results of the study allowed us to identify the possible barriers that arise during the formation of partnerships and the most significant areas of social partnership between employers and economics universities. Successful partnership between employers and universities will ensure relative sustainable development of higher economic education, on the one hand, and, on the other hand, improve the image and reputation of enterprises, which means their sustainable development and competitiveness. This will confirm the importance and demand of the enterprise as a mandatory partner for improving the quality of higher education.

Keywords: directions of social partnership; economic education; employers; graduates of economics universities; sustainable development.

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1. Introduction

At the World Economic Forum in Davos in 2016, Klaus Schwab (Schwab 2016) described the changes taking place in the economy as the fourth industrial revolution (industry 4.0), which is characterized by the merging of technologies and blurring the boundaries between the physical, digital and biological worlds. According to Klaus Schwab (Schwab, 2016), in the future, talent, more than capital, will represent the critical factor of production. It is a human being with his knowledge, skills and abilities will be the main resource of the digital economy. It is not without reason that in the calculations of the Bloomberg Innovation Development Index of the countries (The Bloomberg Innovation Index) in the metric «Postsecondary education» such criteria as number of secondary

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graduates enrolled in postsecondary institutions as a percentage of cohort; percentage of labor force with tertiary degrees; annual science and engineering graduates as a percentage of the labor force and as a percentage of total tertiary graduates are considered (The Bloomberg Innovation Index). When calculating the Global Competitiveness Index 4.0, in Pillar 6: Skills there are indicators such as «Quality of vocational training», «Skillset of graduates», «Ease of finding skilled employees» for assessment of which the following questions are used: «In your country, to what extent do graduating students from secondary education possess the skills needed by businesses?», «In your country, to what extent do graduating students from university possess the skills needed by businesses?», «In your country, to what extent can companies find people with the skills required to fill their vacancies?» (The Global Competitiveness Report 2018).

In order to be competitive in new conditions, companies will need personnel with new competencies, skills to adapt to changes and the ability to learn constantly. As the impact of AI (Artificial Intelligence) and disruptive technology grows, candidates who can perform tasks that machines cannot are becoming more valuable — and that underscores the growing importance of soft skills, which are hard for machines to emulate. Having said that, universities could substantially increase the value of the college degree, if they spent more time teaching their students critical soft skills. Recruiters and employers are unlikely to be impressed by candidates unless they can demonstrate a certain degree of people-skills (Chamorro-Premuzic & Frankiewicz, 2019).

Thus, modern education should be focused on the acquisition of skills to acquire knowledge independently, creative thinking and the ability to apply new knowledge. This can be achieved only in close cooperation with business.

As employment opportunities are important for graduates, today's university managers seek to provide their graduates with necessary knowledge and skills for employment.

Higher education in Ukraine is going through difficult periods of renewal. In such conditions, graduates of economics universities and faculties often do not find work in their specialty or are not satisfied with the work that is offered to them in the labor market. The reasons for job dissatisfaction may vary: low wages, inability to adapt to professional community, inability to re-socialize, lack of necessary communicative competence, insufficient professional knowledge, reluctance of graduates to study in the workplace, low level of practical training.

According to the National Institute for Strategic Studies, the modernization of higher education in Ukraine requires overcoming a number of problems, among which the most relevant are as follows: mismatch of the structure of training of specialists to the real needs of the economy, reduced quality of education, corruption in the higher education system, isolation from research, slow integration into the European and world intellectual space (National Institute for Strategic Studies, 2014). A similar situation in the field of higher education confirms the need to find ways of such transformation that would ensure a certain balance of demand and supply of labor force and, as a result, the development of the higher education system in general and economic education, in particular. One of the most fruitful ways to change the current situation and achieve the competitiveness of graduates of economics universities and faculties is social partnership with employers.

2. Theoretical background

The problems of social partnership were considered by many Ukrainian specialists (Pokidina 2016; Tsugan 2017; Tarasenko, Demchenko 2017; Savchenko, Zbritskaya 2012; Martiakova et al. 2013; Ilich 2017). Vectors of promotion of economic educational services in Ukraine were considered by Lysytsia, Prytychenko, Gron (2017). As part of the discussions at the annual National Forum «Business-Universities» held by the Center for the Development of Corporate Social Responsibility with the support of the Ministry of Education and Science of

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Ukraine, the skills necessary for the development of the Ukrainian economy until 2030 are determined. The objectives of the forum are as follows: identifying gaps between the requirements of companies to the skills of young professionals and the skills that are formed by universities today and will be formed in the future (National Forum «Business Universities» 2016).

The authors of the article agree with the opinion that social partnership in higher education is understood as the interaction of universities, government bodies and local governments, employers, non-profit organizations and students themselves in order to achieve consensus and meet the needs and interests of each party based on the principle of social justice (Bezvuh, Stopchak 2015; Girdzijauskaite et al. 2019).

One more point of view, that deserves attention (Ilich 2017), that the interaction of labor markets and education is a technology for coordinating the behavior of all market actors (the state, trade unions, employers' organizations, educational institutions and students) in the process of which the matching of supply and demand for skilled labor is achieved, prerequisites are created for the reproduction of human capital and sustainable socio-economic growth is ensured.

Relations of social partnership are collective in nature and are based on the collective interest of parties. The term «social partnership» in Ukraine appeared from the end of 1991, in particular, in the regulation of social labor relations.

Social partnership in the field of vocational education is a relatively new category, which, as (Shcherbak 2008) indicates, in its essence becomes an indispensable condition for ensuring the quality of training of skilled workers in the process of transition to new educational standards based on competencies.

The first steps in this direction in Ukraine were as follows: the creation of the National Social Partnership Council under the President of Ukraine (1993), the development of the Draft Law of Ukraine «On Social Partnership» (2002) (which was never adopted). Effective approaches to improving the training of qualified workers in accordance with the requirements of social partnership were outlined in the Concept of Development of Vocational Education in Ukraine for 2005-2010 (2004). However, the concept did not receive the status of a regulatory document. The concept has not been able to effectively influence the modernization processes in the education system, namely: updating the content, introducing modern forms and methods of teaching.

Social partnership research was conducted by Russian scientists. So, (Kredenets 2018) studied social partnership in the professional training of service sector in Austria and Germany. A team of authors (Lavrinenko, Tumalavičius et al., 2016) conducted the research and assessment of the development of the triple partnership between the participants of innovation systems – universities, business, and government in the Latvia-Lithuania-Belarus cross-border region. The importance of well-established links between universities and companies in achieving economic growth is considered by some scientists (Branten, Purju 2015).

Cooperation of entrepreneurs with institutions of vocational and higher education is viewed as close interaction between the educational and the private sectors (Grinevica, Rivza 2016). It will ensure that specialists are prepared for performing specific operations and supply professionals in the industries where they are not enough. Knowledge transfer between universities and business will work best where there is a general framework of cooperation and mutual understanding, involving partnerships, joint projects and the exchange of people, respectively using social environment aspects (Aleksejeva 2016; Atkočiūnienė, Girnienė 2015; Zemlickiene et al. 2017; Tvaronavičienė, Razminienė 2017; Peterlin et al. 2018; Razminienė, Tvaronavičienė 2018).

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Thus, competitiveness will be achieved; in turn, realization of higher education goals alongside with accomplishment of business tasks involves entrepreneurs into socially responsible action providing sustainable competitiveness.

The partnership approach was based on the assertion that only through meaningful and widespread intersectoral interaction, initiatives to ensure sustainable development can be innovative and consistent, which allows scientists to solve the most complex tasks of economic and social development.

According to German Prof. Dr. Michael Jünger there has never before been such a great need for a talented, enterprising workforce in a global competitive economic environment. By being out of touch with a university, its students and young professionals, they become less attractive as prospective employers and often find it more challenging to recruit graduates and commit them for their first 2-3 professional years. It therefore seems much more effective for a company to collaborate with the academic world than not. At the same time, for effective cooperation it is necessary to understand the specific patterns of activity of each of the parties. Obviously, the core interest of both differs. When they collaborate, each party has certain expectations of the other side – the companies expect innovative and state-of-the-art lectures to secure high quality education, valuable knowledge and groundbreaking methodologies, while the universities expect their students to be given business experience e.g. through internships and opportunities to put their skills into practice. The academics also expect to be given the opportunity to transfer theoretical ideas into practical projects and to implement research in the real world (Jünger 2016).

According to the experts of IBM Institute for Business Value (King 2015) boosting the value of today's higher education system and, most important, helping prepare students for life after class, means adopting a more practical and applied approach to education. Integral to this is building and expanding partnerships between academia and the private sector to create a more valuable education ecosystem.

Foreign experts consider models of cooperation between universities and industry, their advantages and disadvantages, noting that universities are among the external partners that offer high promise, since they allow access to an enormous global pool of talent and skills (Perkmann, Salter 2012). The opinion of scientists (Raudeliūnienė, Tvaronavičienė, Dzemyda 2014) that in conditions of global economy key success factors of sustainable entrepreneurship consist of four dimensions, among which there are sustainability-driven understanding in all business processes; entrepreneurship and sustainable development competences (such as systems-thinking competence, embracing diversity and inter-disciplinarily, foresight-thinking competence, normative competence, action competence, interpersonal competence, strategic management deserves attention. Assessment of university graduates by potential employers, in terms of their mastering competencies, could be one of the factors that makes it possible to assess the effectiveness of the work of the university, thereby helping to solve a problem raised by specialists. According to (Volchik, Maslyukova 2017), it should be considered that education as a specific type of activity and institution is associated with the production of public goods and trust and performs an important social function.

It is understood that the methods of solving problems by one participant (state, industry, education institutions) have already been used and turned out insufficiently effective. Working separately, each participant performs separate activities, often competes with others and / or duplicates actions, wasting valuable and limited resources. Scattered efforts lead to the development of the «search for the guilty» practice, when withdrawal from solving a problem and inaction is transferred to the other side of the relationship.

Under these conditions, the partnership approach creates new opportunities for social development by better understanding the conditions of activity and the possibilities of each individual partner, as well as finding new ways to use them in order to achieve the common good. In addition to the mentioned common characteristics,

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each participant has its/his own area of competence, expectations and work style. Thanks to a successful social partnership, the individual qualities and capabilities of each partner can be combined to achieve a common objective.

In the European Education Glossary «Education Eurotuning» (Tuning Educational Structures in Europe), published in 2006, the term «social partnership» is interpreted as the cooperation of all interested parties (social partners) to realize the objective of the Bologna process.

It can be concluded that one should not doubt about the necessity and expediency of developing social partnership in the sphere of education. However, the national model and possibilities of social partnership may not correspond to international practice.

Research objectives and methodology. Analysis of research results and publications on the partnership of domestic and foreign experts showed that although the understanding of the need for cooperation with universities is recognized by almost all business and universities representatives, there is no consistency in the company's approaches to partnerships and the clarity of reasons for choosing future partners and possible benefits from partnership that determines the relevance of this study.

The objective of the article is to determine the possible directions of social partnership between employers and economics universities. To achieve the objective, it is offered to solve the following tasks: 1) summarize the experience of research of partnerships in the field of vocational education; 2) analyze the responses of employers to the questionnaire offered to them; 3) identify barriers that arise during the formation of partnerships between universities and employers; 4) consider the directions of social partnership of employers and economics universities.

It is necessary to pay attention to the fact that Ukrainian employers are in a state of uncertainty, which cannot but affect their requirements for graduates who are looking for a job. The situation is complicated by the combination of both external and internal factors affecting the organization of the professional environment. External factors are social institutions of economics, education, science, which are forced to focus on constant changes. Internal factors are the lack of demand for graduates in the labor market due to a clear excess of economists. According to the State Employment Service of Ukraine, as of 1.02.2019 in Ukraine, the official number of unemployed is 364,271 people, while 4,6% fall on those with an economic education (Official Website of the State Employment Service of Ukraine). Let us analyze the data indicating the complexity of the situation in the labor market for graduates of economic specialties (Table 1).

Table 1. The situation in the labor market of Ukraine in the context of economic specialties

Indicator	Value	
	Total	Separately by economic specialties
Number of unemployed people (as of 1.02.2019)	364 271	16 557
Number of graduates, people (2018)	412 914	78 453
Number of vacancies, units (as of 1.02.2019 г.)	142 812	14 814

Source: compiled by the authors based on the data from the State Employment Service of Ukraine, State Statistics Service of Ukraine (2019)

Based on the data given in Table 1, it can be concluded that the number of graduates in economic specialties significantly exceeds the number of vacancies in the labor market. Discrepancies in the number of available vacancies and the number of specialists with the appropriate education indicate changing conditions and demands of the labor market.

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In turn, it should be noted that according to the forecasts of the State Employment Service in 2019, the number of vacancies in Ukraine is expected to grow by 4% (Official Website of the State Employment Service of Ukraine 2019). Among the promising professions for which economic education is needed the following ones will lead: an accountant, an economist, a sales manager, a specialist in marketing.

The authors conducted a marketing research of the partnership problems of employers and economics universities that offer training in economic specialties. For the research the primary and secondary data were collected on this issue. The primary data were obtained in a survey of employers conducted in the period of January – February 2019. The respondents were 80 employers, who are experts in their industries (machine-building industry, chemical industry, food industry, light industry, service industry, banks). The criteria for the choice of experts were: 1) period of work in the company not less than five years; 2) working in a state or a private company; 3) belonging to one of the levels of management: top management, average level of management, the lowest level of management; 4) experience of work in one of the industries (machine-building industry, chemical industry, food industry, light industry, service industry and banks). Among the mentioned industries there are 16 big companies (mainly machine-building industry, chemical industry, food industry and banks), 26 middle companies (mainly light industry, food industry), 38 small companies (service industry and banks). Top management is presented by employers of big companies and middle companies, small companies. Average level management – these are employers of middle companies and small companies. The lowest level of management is presented by employers of middle and small companies. This made it possible to obtain up-to-date primary information on the state of the quality of the labor market for graduates of economic specialties. The secondary data was collected as a result of analysis of statistical information of the Employment Service of Ukraine.

3. Results and discussion

Among the employers-respondents - female personnel managers dominated - 65%, compared with men - 35%. Most respondents have a total work experience of 13 to 15 years. Managers with economic education dominated – 76,3%, technical education – 25%, humanitarian education – 8,8%. An insignificant part is made up of 1,3% of respondents with legal and psychological education.

The main part of employers-respondents – 48,7%, identify themselves as «average level managers», 41,3% – representatives of top management, 10% – heads of the lowest level of management. The employers note that the highest demand – 52,5% there is in marketing specialists, management specialists – 51,2%, 30% – in economists, in finance specialists – 15%, in accountants – 17,5%. The employers, assessing the important personal qualities of applicants for the position, named 1) responsibility, 2) ability to learn in the workplace, 3) communication skills, 4) ability to work in a team. Equally important, but rated below are: creativity, non-standard thinking, emotional control. As for the competencies, the most important competences employers consider to be as follows: «analytical skills and ability to predict», «ability to quickly adapt to professional environment» and «orientation for lifelong learning», «flexibility and psychological resistance to external influence», «foreign language proficiency within professional activities».

62,5% of employers have experience of social partnership with universities, 18,8% of employers do not have experience of social partnership with universities, but they have plans to acquire it.

Thus, 81,3% show a positive attitude towards the prospects of social partnership. Unfortunately, the experience of social partnership was limited to the internship of students at enterprises, which was fixed by contracts with 43,8% of employers.

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33,8% of employers take part in «job fairs». In the opinion of employers there is a clear need to work in this direction, employers say, namely: to invite employers from enterprises to deliver lectures (28,7%), invite experts from enterprises to participate in «round table talks» with students and university professors (18,8%), organize common projects of practitioners from enterprises, university professors, students (13,8%). An interesting fact is that the forms of partnership noted by employers do not significantly differ depending on the field of activity of the enterprise. From this we can conclude that 61,3% of employers are ready for partnership with universities and offer specific forms of cooperation. It should be mentioned that the potential for future partnerships was 25% of employers who had not yet decided on their intentions regarding social partnership with universities, due to the lack of such experience.

The choice of forms of partnership depending on the gender of employers is worth the scientists' attention (Fig. 1).

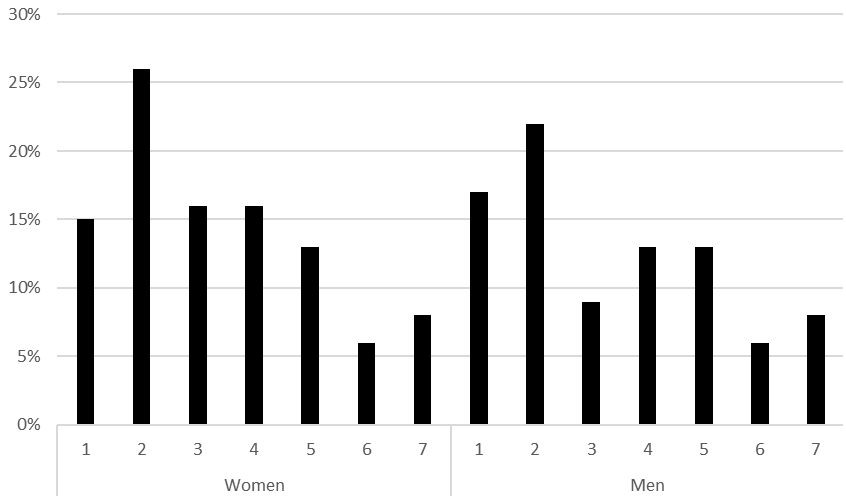

Figure 1. Employers' choice of forms of partnership depending on the gender of employers
Source: compiled by authors

Note: (1) Joint projects of practitioners from enterprises, lecturers and students, (2) Internship of students at enterprise, with further employment, (3) Participation of enterprises in «job fairs» held at university, (4) Invitation of practitioners for delivering lectures and practical classes, (5) Inviting experts from enterprises to participate in «round table talks» with students and lecturers of universities, (6) Exchange of internships for practitioners and lecturers, (7) Participation of enterprise experts in creating curricula for universities

Despite the unequal participation on the grounds of gender identity in the survey of employers, the options for social partnership are more the same, for example, the need for «internships of students at enterprise, with further employment», the demand for «joint projects of practitioners from enterprises, lecturers and students», the justification of «the invitation of experts from enterprises to participate in «round table talks» with students and lecturers of universities», «participation of enterprise experts in creating curricula for universities».

The forms of partnerships depending on the experience of internship of employers abroad are found significant (Fig. 2).

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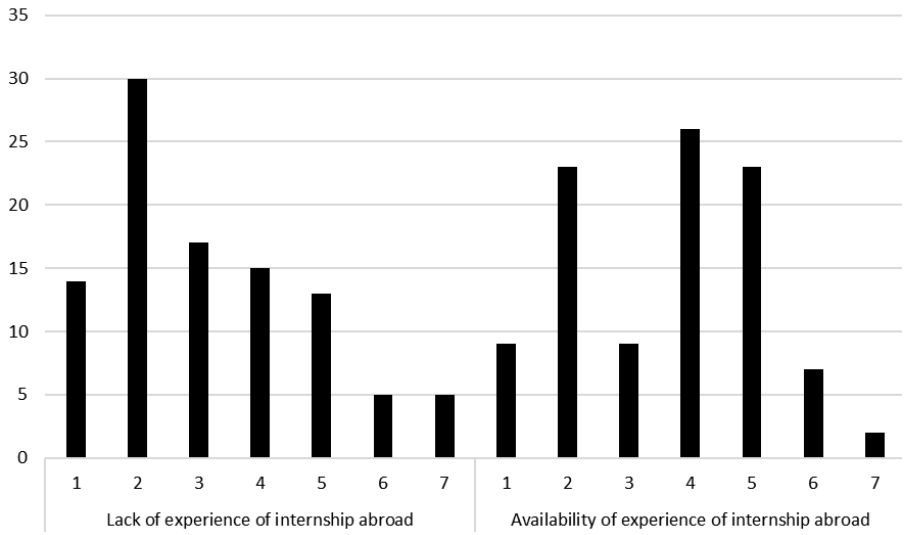

Figure 2. Employers' choice of the forms of partnership depending on their experience of internship abroad
Source: compiled by authors

Note: (1) Joint projects of practitioners from enterprises, lecturers and students, (2) Internship of students at enterprise, with further employment, (3) Participation of enterprises in «job fairs» held at university, (4) Invitation of practitioners for delivering lectures and conducting practical classes, (5) Inviting experts from enterprises to participate in «round table talks» with students and lecturers of universities, (6) Exchange of internships for practitioners and lecturers, (7) Participation of enterprise experts in creating curricula for universities.

«The experience of internship abroad» provides a basis for choosing such forms of partnership as «invitation of practitioners for delivering lectures and conducting practical classes». This is due to the habitualisation of such forms of partnership in Europe and the United States, which gives positive results, namely: bringing theoretical courses at universities to practical activities, provides an orientation to the European model of education, identifying real situations and problems in the field of business that can be tied to risk, the need for quick decision making.

Various forms of partnership are given preference during the survey of employers depending on the level of management (Fig. 3).

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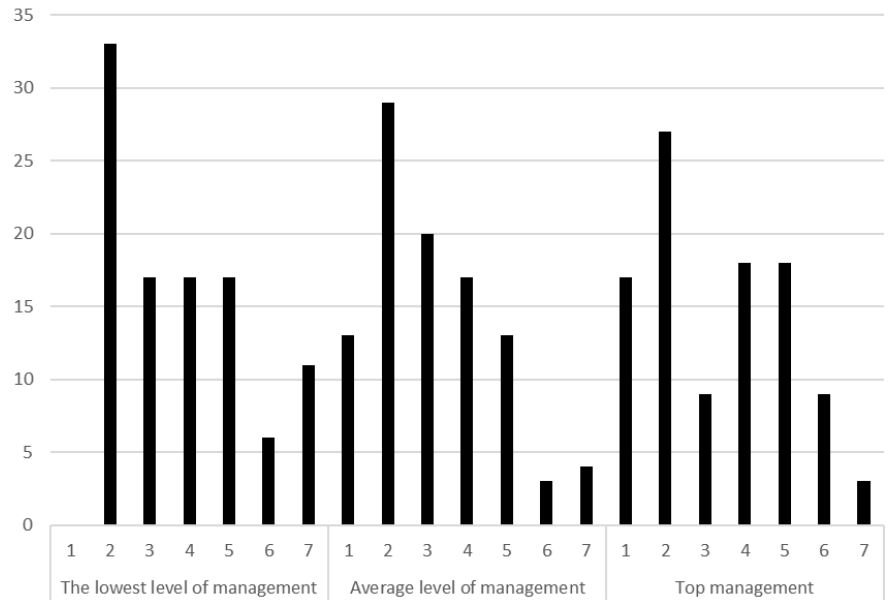

Figure 3. Forms of partnership depending on the level of management of employers
Source: compiled by authors

Note: (1) Joint projects of practitioners from enterprises, lecturers and students, (2) Internship of students at enterprise, with further employment, (3) Participation of enterprises in «job fairs» held at university, (4) Invitation of practitioners for delivering lectures and conducting practical classes, (5) Inviting experts from enterprises to participate in «round table talks» with students and lecturers of universities, (6) Exchange of internships for practitioners and lecturers, (7) Participation of specialists of enterprise in creating curricula for universities

All respondents consider the necessary form of social partnership between universities and employers «internship of students at enterprise, with further employment». The lowest level managers do not comment on such a form of partnership as «joint projects of practitioners from enterprises, lecturers and students», since this decision is not within their competence. Average level managers make decisions about «participation of enterprises in «job fairs» held at university», as representatives of top management delegate these powers to them. Due to sufficient professional experience, confidence in the legitimacy of their decisions, representatives of top management choose and justify such forms of partnership as «inviting experts to participate in «round table talks» with students and lecturers of university», «invitation of practitioners for delivering lectures and conducting practical classes».

Employers named the main barriers to social partnership with universities: 1) «lack of information about possible forms of partnership of university/employers» (33,8%), 2) «lack of interest from one of the participants in a potential partnership» (52,5%), 3) «impossibility of financing this process by one of the partners» (28,7%), 4) «distraction of personnel from performing basic duties» (26,3%), 5) «possibility of disclosing confidential information» (18,8%), 6) «imperfection of the legislative base» (28,7%) and 7) «level of organization of the partnership does not meet the requirements of one of potential partners» (22,5%) despite the level of management and sphere of activity.

As the analysis of the problems arising in the way of interaction between employers and universities shows, there appears a number of barriers to cooperation, which are directly dependent on the level of management (Fig. 4).

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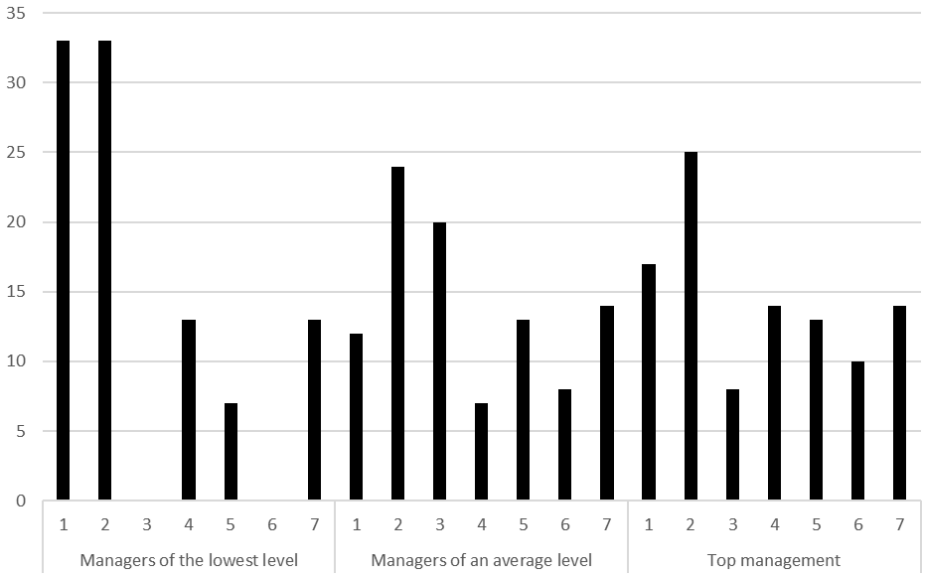

Figure 4. Barriers to partnership depending on the level of management of employers
Source: compiled by authors

Note: (1) Lack of information about possible forms of partnership of university / employers, (2) Lack of interest from one of the participants of potential partnership, (3) Impossibility of financing this process by one of the partners, (4) Distraction of personnel from performing basic duties, (5) Possibility of disclosing confidential information, (6) Imperfection of the legislative base, (7) Level of organization of the partnership does not meet the requirements of one of potential partners

Thus, the managers of the lowest level, name «lack of information about possible forms of partnership of university / employers» and «lack of interest from of one of the participants of potential partnership» as the main barriers. At the same time, this category of managers does not mention such barriers to partnership as «impossibility of financing this process by one of the partners» and «imperfection of the legislative base». This is explained by the fact that they are not included in the process of organizing partnerships and cannot independently make decisions on stimulating the interest of participants of partnership. Average level managers name such barriers as «lack of interest from one of the participants of potential partnership» and «impossibility of financing this process by one of the partners». The decision on partnership and possibility of financing is in the competence of top management, therefore, «who» should be interested in partnership and «for what purpose» are up to the top managers to decide. According to representatives of top management, the main barriers to partnership are «the lack of interest from one of the participants of potential partnership» and «distraction of personnel from performing basic duties», «lack of information about possible forms of partnership of university / employers». Representatives of top management, as a rule, are responsible for the final result of professional activity and this directly affects their reputation and ensures the preservation of the prospects for «career growth».

When considering the barriers named by representatives of various fields of activity, the following dependence was noted (Fig. 5).

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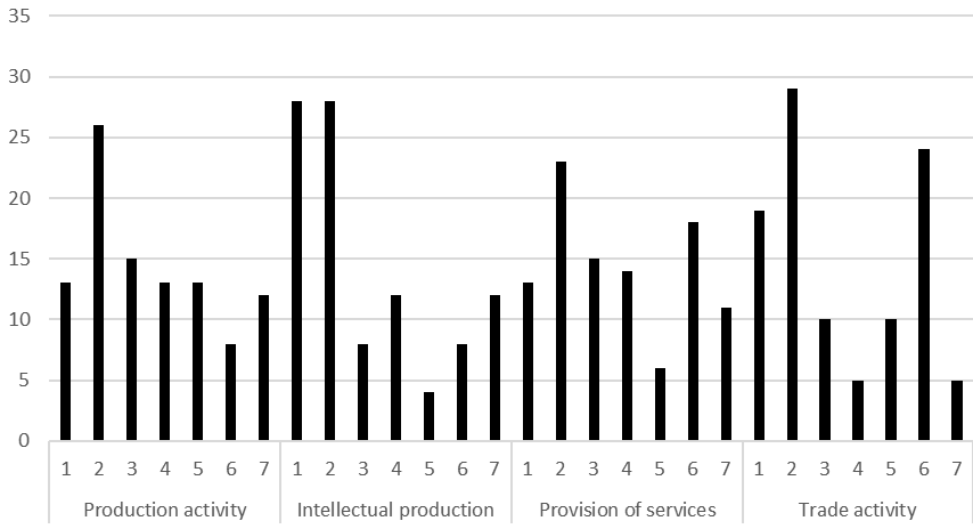

Figure 5. Partnership barriers depending on the employer's sphere of activity
Source: compiled by authors

Note: (1) Lack of information about possible forms of partnership of university / employers, (2) Lack of interest from one of the participants of potential partnership, (3) Impossibility of financing this process by one of the partners, (4) Distraction of personnel from performing basic duties, (5) Possibility of disclosing confidential information, (6) Imperfection of the legislative base, (7) Level of organization of the partnership does not meet the requirements of one of potential partners

Regardless of the field of activity, all respondents marked, as the most significant, such barrier to partnership as «lack of interest from one of the participants of potential partnership», which confirms the fact, that employers believe that universities do not seek partnership with business.

Employers in the field of «provision of services» and «trade activity» marked as significant such a barrier as «imperfection of the legislative base», which indicates that it is important for these employers to maintain the existing competitiveness within the framework of the legitimate field of activity, since they are largely dependent on the higher structures regulating their activities. For employers in the fields of «intellectual production» and «trade activity», the main barriers are «lack of information about possible forms of partnership of university / employers» and «lack of interest from one of the participants of potential partnership». The enterprises of these industries do not have a long experience of partnership with universities in comparison with the enterprises of the «production activity» and «provision of services». This can be explained by the fact that they are not fully aware of the benefits of partnership, do not see a variety of prospects for themselves, being focused on their work.

«Impossibility of financing this process by one of the partners» was marked as one of the significant barriers for partnership between enterprises by the spheres of «production activity» and «provision of services», which can be explained by the scarcity of free financial resources of enterprises or universities.

In fact, overcoming these barriers will ensure the success of social partnership between employers and universities and, as a result, it is possible to predict the improvement of curricula and their compliance with the needs of the market. As a result of the above, competences demanded by employers will be provided, it will make possible the target job placement for graduates who, on the one hand, are already familiar with the work of the enterprise, and, on the other hand, have developed loyalty to it, as to the value that future employees want to save. As a result, a possible guaranteed employment of university graduates will be provided, as 67,5% of employers note. Employers consider the «common projects of practitioners of enterprises, lecturers and students» to be promising

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(42,5%). «Inviting practitioners to deliver lectures», in the opinion of 41,3% of employers, will allow raising practical classes to a higher level, bringing them closer to actual production, providing real services, which will allow future employees to adapt to the professional environment. Most likely, it is thanks to this form of cooperation that an opportunity will arise to learn how to work in a team and understand the significance of the need of lifelong learning.

It is not surprising that the main incentive to build a social partnership with universities is the possibility of selecting potential employees. This is noted by 85% of employers. Another incentive naturally coincides with this incentive: «the possibility of employers to participate in the development of university curricula to adjust students' competencies so that they meet the expectations of employers as much as possible». 30% of employers found this important and are willing to cooperate.

The survey of employers showed that they rather highly assess the theoretical training of graduates, considering practical training and communicative competence of graduates of economics universities rather low. 51,2% of employers associate disadvantages in the training of graduates in economics with an exaggeration of their own professional competencies, which, as a result, does not encourage them to learn new things. The employers explain the reasons for the poor quality of university training in different ways. For example: «orientation of graduates only to high wages» (55%) rather than self-development, «exaggeration of their own professional competencies when targeting a position that interests them» (47,5%), «lack of interaction between universities and employers» (43,8%), «lack of interest in the future profession» (41,3%), «insufficient motivation of students to work in the specialty» (38,8%).

Back in the mid-90-ies, the famous scientists Henry Etzkowitz (USA) and Loet Leydesdorff **(**Netherlands**)** developed a triple helix model (Fig. 6), the essence of which is that the potential for innovation and economic development in today's knowledge-oriented society lies in the more important role of universities and close cooperation of university, private enterprises and the state to create new institutional and social forms of production, transformation and application of knowledge. One of the key roles is assigned to universities, which not only perform the functions of a training institution, but also focus on the capitalization of knowledge (Etzkowitz, 2008).

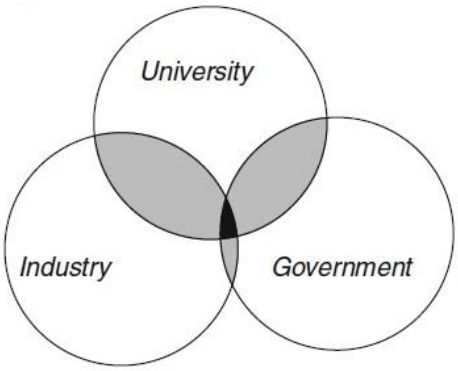

Figure 6. A triple helix model
Source: Etzkowitz, 2008

The authors of this article suggest the following model of partnership between universities and employers, the result of the successful implementation of which will be to meet the needs of graduates, employers and universities (Fig. 7).

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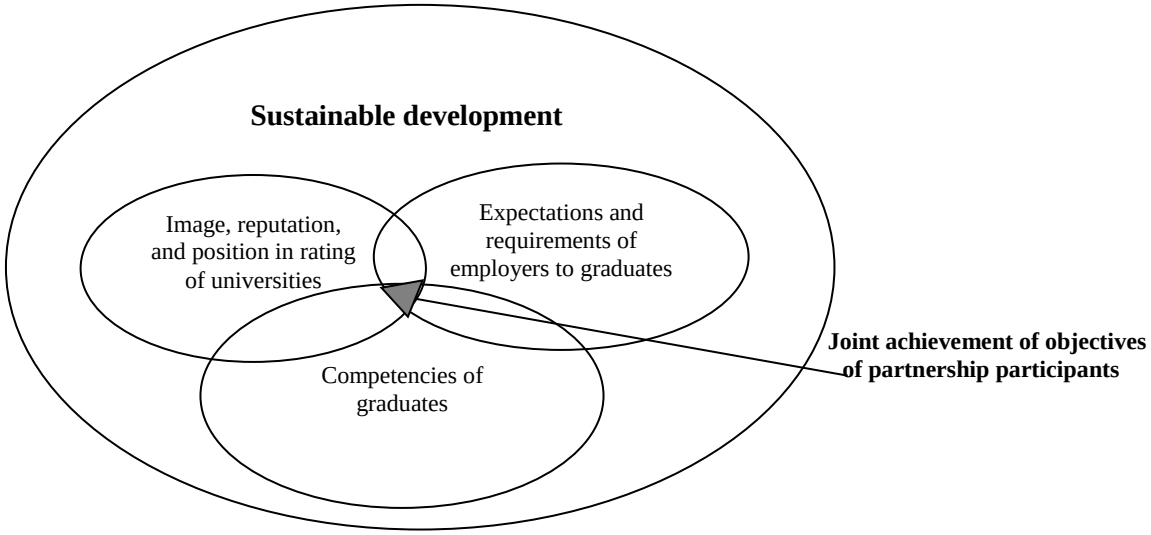

Figure 7. Model of social partnership of universities and employers
Source: developed by the authors

Cooperation in the form of partnership of all participants (employers and universities) will ensure the joint achievement of the objectives of partnership participants. This, as a result, will lead to the formation of competencies of graduates demanded by employers; positive image and reputation; high ratings of universities and meeting of expectations and requirements of employers. Positive image and reputation of universities will become the basis for sustainable development of higher education in Ukraine, inadmissibility of reducing its quality.

Conclusions

The article further developed the analysis of the directions of social partnership of employers and universities in the sphere of economic education in Ukraine.

As the research showed, the average level employers will find attractive the following:
- joint projects of practitioners from enterprises, lecturers and students to become aware of business problems and problems in the academic environment;
- organization of trainings for practitioners in the role of lecturers with «case studies» as close as possible to the specifics of production;
- exchange of internships for practitioners and lecturers in order to develop such problem tasks for students which will help to form the necessary competencies that are in demand in a particular field of activity;

For employers representing top management, the following directions may be significant and real:
- inviting of experts from enterprises to participate in «round table talks» with students and university lecturers, which will contribute to adjustment of graduates' values, awareness of the detailed specific characteristics of business, leading to the success of a particular business. This will help graduates to choose a model of behavior in situations of risk that are fraught with loss of profits, and sometimes bankruptcy of the enterprise;
- organization of PR events by enterprises to improve their reputation, informing about partnership with universities, demonstrating readiness to contribute to improving the quality of higher education in Ukraine.

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Systematic and long-term cooperation of universities with employers, monitoring the specifics of not only the goals of employers, but also their various models of behavior, analysis of information about employment of graduates and problems associated with adaptation of graduates to the professional community, will allow universities to carry out the process of accompanying the orientation to a professional career during training of students.

In order to provide consumers with a wide range of educational services, it is necessary to offer them competencies, which are in demand among employers and provide an opportunity for decent wages. This will be the basis for the self-improvement of graduates and will be in line with current trends in the labor market and will contribute to sustainable development of higher education. In addition, an advantage for employers will be the opportunity to improve sustainable development of the enterprises that will confirm their importance and relevance as mandatory partners.

References

Aleksejeva, L. (2016). Country's competitiveness and sustainability: higher education impact, Journal of Security and Sustainability Issues 5(3): 355–363. http://dx.doi.org/10.9770/jssi.2016.5.3(4)

Atkočiūnienė, Z., Girnienė, I. (2015). Impact of Knowledge Management Processes on the Creation of Innovations: Case Study. Proceedings of the 16th European Conference on Knowledge Management/Academic Conferences and Publishing International Limited. p. 321-329. http://toc.proceedings.com/27956webtoc.pdf

Bezvuh, S., Stopchak A. (2015). Social partnership of science and business: forms of cooperation, problems and recommendations for their solution, *Bulletin of Khmelnytsky National University. Economics* 3: 7–14.

Branten, E., Purju, A. (2015). Cooperation projects between university and companies: process of formation and objectives of the stakeholders, *Entrepreneurship and Sustainability Issues* 3(2): 148-156. http://dx.doi.org/10.9770/jesi.2015.3.2(3)

Chamorro-Premuzic, T., Frankiewicz, B. (2019, January 7). Does Higher Education Still Prepare People for Jobs? Retrieved from https://hbr.org/2019/01/does-higher-education-still-prepare-people-for-jobs?referral=03759&cm_vc=rr_item_page.bottom

Decree of the President of Ukraine «National Social Partnership Council» (1993, February 8), 34/93 Retrieved from: http://zakon.rada.gov.ua

Draft Law of Ukraine «On Social Partnership» № 2173 (2002, September 10). Retrieved from http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=13032

Etzkowitz, H. (2008). The Triple Helix: University–Industry–Government Innovation in Action, Routledge, N.Y., London: 12–13

Girdzijauskaite, E., Radzeviciene, A., Jakubavicius, A. 2019. Impact of international branch campus KPIs on the university competitiveness: FARE method, *Insights into Regional Development* 1(2): 171-180. https://doi.org/10.9770/ird.2019.1.2(7)

Grinevica, L., Rivza, B., Rivza, P. (2016). Scenarios for reducing youth unemployment and promoting sustainability in the regions of Latvia, *Journal of Security and Sustainability Issues* 5(3): 437–449. DOI: http://dx.doi.org/10.9770/jssi.2016.5.3(11)

Ilich, L.M. (2017) Socio-economic mechanism of interaction between labour and education markets. Econ. promisl, 2 (78): 97-116. http://dx.doi.org/10.15407/econindustry2017.02.097 [in Ukrainian].

Jünger M. (2016) Business Collaboration between the Academic World and Industry https://www.tefen.com/insights/services/SandM/collaboration_between_the_academic_world_and_industry

King, M. (2015, July 17). Why Higher Ed and Business Need to Work Together. Retrieved from https://hbr.org/2015/07/why-higher-ed-and-business-need-to-work-together

Kredenets, N. (2018). Theory and practice of social partnership in vocational training of service sector specialists in Austria and Germany. Thesis for a candidate's degree (PhD) in pedagogical sciences. Specialty 13.00.04 – Theory and methods of professional education. – The Institute of Pedagogical and Adult Education of the National Academy of Educational Science of Ukraine. Kyiv. [in Ukrainian]

Lavrinenko, O., Ohotina, A., Tumalavičius, V., Pidlisna, O.V. (2016) Assessment of partnership development in cross-border regions' innovation systems (Latvia-Lithuania-Belarus), *Journal of Security and Sustainability Issues* 6(1): 155–166. http://dx.doi.org/10.9770/jssi.2016.6.1(12)

Lysytsia, N., Prytychenko, T. & Gron, O. (2017). Vectors of promotion of economic educational services in Ukraine, *Economic Annals-XXI* 165(5-6): 138-142. https://doi.org/10.21003/ea.V165-28

Martiakova, O.V., Snihova, S.M., & Mudra, O.V. (2013) The regulation of educational services market and labor market interaction based on the mechanism of quality control, *Marketing and Management of Innovations* 3: 154-168. [in Ukrainian]

National Forum «Business-Universities» IV (2016). The report «Skills for Ukraine in 2030: Business View». Retrieved from: http://csr-ua.info/csr-ukraine/wp-content/uploads/2016/102016/10/Навички_2030.pdf

National Institute for Strategic Studies. «Global Tendencies and Problems of Education Development: Consequences for Ukraine». Analytical note. (2014, May) Retrieved from http://old2.niss.gov.ua/articles/1537/ [in Ukrainian]

Perkmann M., Salter, A. (2012). How to Create Productive Partnerships with Universities Magazine: Research Feature, *MIT Sloan Management Review* 53(4): 79-88. Retrieved from https://sloanreview.mit.edu/article/how-to-create-productive-partnerships-with-universities

Peterlin, J., Dimovski, V., Tvaronavičienė, M., Grah, B., Kaklauskas, A. (2018). The strategic process of developing social aspects of sustainability through the vision reflection in business education, *Technological and Economic Development of Economy* 24(4): 1718–1736 https://doi.org/10.3846/tede.2018.5198

Pokidina, V. (2016). Universities and business: international experience of cooperation and prospects for Ukraine. Project «Popular Economy: The Price of the State». 4, 25 p. Retrieved from: http://cost.ua/files/Universities%20and%20business_report.pdf [in Ukrainian]

Raudeliūnienė, J., Tvaronavičienė, M., Dzemyda, I. (2014). Towards economic security and sustainability: key success factors of sustainable entrepreneurship in conditions of global economy, *Journal of Security and Sustainability Issues* 3(4): 71–79. http://dx.doi.org/10.9770/jssi.2014.3.4(7)

Razminienė, K., Tvaronavičienė, M. (2018). Detecting the linkages between clusters and circular economy, *Terra Economicus* 16(4): 50-65 https://doi.org/10.23683/2073-6606-2018-16-4-50-65

Savchenko, G. & Zbritska, T. (2012). Ways to improve connection and collaboration between labour and education markets. *Bulletin of Social and Economic Research* 1: 273-280. http://nbuv.gov.ua/UJRN/Vsed_2012_1_42 [in Ukrainian]

Scherbak, O. (2008). Vocational-technical education of Ukraine on the path to social partnership, *Pedagogic and Psychology of Professional Education* 1: 148–156. [in Ukrainian]

Schwab, K. (2016, January 14). The fourth industrial revolution: what it means, how to respond. World Economic Forum. Retrieved March 5, 2019, from https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) Approved by the Ministerial Conference in Yerevan, (2015, May 14-15) – K.: LTD «TSC». p. 32.

State Employment Service of Ukraine (2018-2019) Data on the professional structure of registered unemployed and vacancies in the context of professions. Retrieved from: https://www.dcz.gov.ua/publikaciya/3-dani-shchodo-profesiynogo-skladu-zareyestrovanyh-bezrobitnyh-ta-vakansiy-u-rozrizi

State Statistics Service of Ukraine. Retrieved from: http://www.ukrstat.gov.ua/

Tarasenko, S., Demchenko, M. (2017). Collaboration of universities and business: forms and perspectives of development as a condition of increasing innovation of economy, *Economy and Society*, 13. Retrieved from: http://economyandsociety.in.ua/journal/13_ukr/49.pdf [in Ukrainian]

The Bloomberg Innovation Index. Retrieved from https://www.bloomberg.com/graphics/2015-innovative-countries/

The concept of the development of vocational (professional) education Ukraine. (2004) Vocational and technical education 3: 3.

The Global Competitiveness Report 2018. Retrieved from http://reports.weforum.org/global-competitiveness-report-2018/

Tsugan, V. (2017). Development of social partnership in professional education in the modernization of the educational sector, *Collection of scientific papers «Bulletin of Postgraduate Education». Series «Management and Administration»* 3(32): 125-137. [in Ukrainian]

Tuning Educational Structures in Europe. Retrieved from: http://www.owwz.de/glossar.html?&L=2&tx_sfbolognaglossar_pi1[s]=RU&tx%20%20_sfbolognaglossar_pi1[uid]=52

Tvaronavičienė, M., Razminienė, K. (2017). Towards competitive regional development through clusters: approaches to their performance evaluation, *Journal of Competitiveness* 9(4): 133 - 147, https://doi.org/10.7441/joc.2017.04.09

Volchik, V., Maslyukova, E. (2017). Performance and sustainability of higher education: key indicators versus academic values, *Journal of Security and Sustainability Issues* 6(3): 501–512. http://dx.doi.org/10.9770/jssi.2017.6.3(14)

Zemlickiene, V., Mačiulis, A., Tvaronavičienė, M. (2017). Factors impacting the commercial potential of technologies: expert approach, *Technological and Economic Development of Economy* 23(2): 410-427 http://dx.doi.org/10.3846/20294913.2016.1271061

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MODELLING THE CROWDFUNDING TECHNOLOGY ADOPTION AMONG NOVICE ENTREPRENEURS: AN EXTENDED TAM MODEL

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Abstract. Computer-mediated crowdfunding is deemed as an emerging technology used by novice entrepreneurs to solicit funds from other individuals in order to easily gather fundraising for their innovative ideas. However, lack of information on the attributes of crowdfunding platforms coupled with the lack of the knowledge about the techniques of use of these technologies make this fundraising tool not very effective. In this study, we try to elucidate, despite the unprecedented infatuation with the investment-based crowdfunding, key factors influencing the intention of Tunisian entrepreneurs to adopt crowdfunding platforms as a main tool of fundraising. The research model was based on an extended Technology Acceptance Model (TAM) with the integration of three new variables: perceived risk with service, perceived risk with transaction and plagiarism risk. The results shows that, both perceived risk with service, perceived risk with transaction and plagiarism risk have a negative impact on entrepreneurs' use of crowdfunding platforms, while perceived usefulness and perceived trust influence positively entrepreneurs' intention behavior. Perceived risks with crowdfunding service and transaction are affected by financing risk, security concerns and psychological factors, while plagiarism risk is influenced by information concerns, perceived control.

Keywords: crowdfunding; risk, trust; Technology Acceptance Model (TAM)

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JEL Classifications: D81, L26, O33

Additional disciplines: information and communication

1. Introduction

It is broadly recognized that crowdfunding has radically metamorphosed the entrepreneurial finance ecosystem. It is defined as an open call over an Internet platform for financial resources in the form of a monetary donation, an exchange for a future product, service, or reward (Kleemann et al., 2008; Belleflamme et al., 2011; Astrauskaitė, Paškevičius, 2018). Commonly, crowdfunding uses web technologies and especially e-payment platforms to

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facilitate electronic transactions between entrepreneurs requesting funds and crowdfunders giving funds. Crowdfunding platforms, such as Ulule, Indiegogo and Kickstarter, give the opportunities, to raise funding, for young entrepreneurs by pitching an innovative idea to their social network.

Asking money from the crowd still in contradiction with classical fundraising ways such as securing funding from banks, venture capitalists and business angels. In fact, Novice Entrepreneurs create their profiles on a crowdfunding platform and clarify their monetary objectives, planning of funds' use, and schedule for objectives attainment.

Nowadays, there is an exponential growth in the number of crowdfunding websites. According to the study reported by the University of Cambridge and KPMG (2016), 5.431 billion euros were exchanged in 2015 in Europe on specialized platforms including 4,412 billion in the United Kingdom alone (Cambridge/KPMG, 2016). As a result, all European countries have a regulatory framework dedicated to crowdfunding phenomenon. However, the United States and Asia are major players in crowdfunding. Investments were worth 33.6 billion euros and 94.6 billion euros respectively in 2015. Indeed, Terry et al. (2015: 8) consider crowdfunding as "potentially the most disruptive of all the new models of finance," with the World Bank (2015) predicting that crowdfunding investments will be a $96 billion a year market in developing countries alone by 2025.

In the other side of the world, Africa still the lowest performing crowdfunding markets (Chirisa & Mukarwi, 2018). In Africa, crowdfunding is a challenge hindered by the lack of legal texts supporting it. Within this framework, crowdfunding is deemed as a new opportunity that can enable funding transfer from donators or investors to entrepreneurs looking for raise funding (Pazowski & Czudec, 2014).

This study is expected to be of substantial interest to both researchers and entrepreneurs. From the academic side, this paper not only makes contributions to research on crowdfunding, however, practically, the results suggest new insight for crowdfunding technology adoption by novice entrepreneurs in order to promote the development of crowdfunding.

2. Literature Review

Crowdfunding owes its origin to the concept of crowdsourcing that means the outsourcing of problem-solving tasks to a distributed network of individuals (Howe, 2006). Crowdfunding makes it possible for those with limited access to traditional sources of financial backing, such as banks or venture capitalists, to acquire financial resources necessary to pursue their projects. Through online transactions, crowdfunding also gives people with disposable income a new way to give to others and "invest" in projects that might not happen without their financial support

Crowdfunding has arisen as an unconventional source of raise funding for different types of entrepreneurial projects and as one of the most interesting tool of Internet finance (Li et al., 2016). In fact, within a crowdfunding campaign, the novice entrepreneurs describe their entrepreneurial projects, choose the appropriate funding instrument and fixe a funding objective and the financial contribution of each funder, as well as the reward of each one of them (Mollick, 2014).

There are four different types of crowdfunding: rewards-based crowdfunding, donation-based crowdfunding, Equity crowdfunding, and lending crowdfunding (Ahlers et al., 2015). In rewards-based crowdfunding platforms such as Kickstarter and Indiegogo, crowdfunders pay small amounts of money in exchange for a reward, which is often the produced item. In donation-based crowdfunding, crowdfunders donate deliberately small amounts without any reward. Usually donation-based crowdfunding platforms are used to raise money for a non-profit or a cause. However, lending platforms and equity platforms are distinguished. In the first case, crowdfunders lend

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money to entrepreneurs and make profits with interest. In the second case, investors take shares in the new start-up seeking raise funding.

Crowdfunding has widely stimulated the interest of researchers in business management. In fact, there are various publications dealing with themes such as crowdfunders' motivations for crowdfunding (Bretschneider et al., 2014) and identifying key factors for a raise funding campaign (Belleflamme et al., 2013). Conversely, there is no studies have been conducted on the factors influencing the acceptance of using crowdfunding platforms neither by entrepreneurs nor by fundraisers in developing countries which are deprived of this technology. For example, Lei et al. (2018) found that potential funders' decision-making process is influenced by different types of uncertainty and risks associated to entrepreneurs' project. In fact, in traditional e-commerce consumers buy a finished product, inversely for funders via crowdfunding platforms, they buy a product that is not yet to be finished. This generates an uncertainty based on perceived trust, perceived risk and perceived usefulness among both novice entrepreneurs who are worry about their project disclosure and funders who are worry about their funds being misappropriated or diverted. While Risk perception theory (RPT) provides a consistent view of subjective risk, we think that adjustments are necessary because researchers have argued that the explanatory power of a theory have to be contingent on the technology's features (Featherman & Pavlou, 2003). In this paper, we take into account the plagiarism risk as mediating variables in addition to risk with services and risk with transaction.

Other studies have also confirmed that information disclosure on the crowdfunding platforms reduces information asymmetry (Mollick, 2014) and increases also the probability of raise funding accomplishment (Ahlers et al., 2015). Nevertheless, there is no previous empirical studies has been performed to identify factors of the intention to use voluntary crowdfunding platforms by novice entrepreneurs in developing countries where crowdfunding platforms are still absent. The aim of our current study was to investigate factors influencing the acceptance of using crowdfunding platforms among Tunisian entrepreneurs. We lead a study among 100 novice entrepreneurs hosted in 12 different business incubators.

3. Theoretical framework and hypotheses

Many researchers have proposed several models of technology acceptance in order to predict users' intention of a specific technology. The measurement of both user experience and satisfaction of several new technological tools have a very interesting importance, especially at the recent shutdown of Google Glass project (Shin & Hwang, 2017). This essential defy stimulated different researchers to propose many acceptance models of technology by potential users. In fact, Fishbein & Ajzen (1977) and Davis (1989) have proposed and verified their theories, and models of the intention to use of technologies. Explicitly, our theoretical framework should referred to the following models and theories:

- Technology Acceptance Model - TAM (Davis, Bagozzi, Warshaw, 1989),
- Theory of Planned Behavior -TPB (Fishbein & Ajzen, 1977),
- Innovation Diffusion Theory - IDT (Moore and Benbasat 1991),
- Motivational Model (Davis, Bagozzi, and Warshaw 1992),
- Combined Model of TAM and TPB (Taylor & Todd, 1995),
- Social Cognitive Theory (Compeau & Higgins, 1995),
- TAM 2 (Venkatesh & Davis, 2000),
- Unified Theory of Acceptance and Use of Technology or UTAUT (Venkatesh et al. 2003),
- TAM 3 (Venkatesh & Bala, 2008).

In this context, many authors carried out various studies dealing deeply with comparative analysis of theories and models of technology acceptance (Venkatesh et al., 2003; Roca & Gagné, 2008; Shin & Biocca, 2017; Jaziri & Touhami, 2018). Moreover, TAMs, have particular attention in the research area of technology adoption. TAM allows us to predict behavioral intention as dependent variables. As our research aims to explore the determinants

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of crowdfunding technology adoption by Tunisian novice entrepreneurs, we think that TAM associated with theories of perceived risk and trust could estimate the behavioural intention to use crowdfunding platforms. In fact, Researches overseas confirm that perceived risk and trust are two crucial variables of crowdfunding adoption. Furthermore, as crowdfunding is a new technology not applied yet in Tunisia, TAM can be considered as suitable to study the acceptance of using crowdfunding platforms by entrepreneurs.

With the widespread of web 2.0 technology, many researchers have applied and adjusted the TAM to this environment. Bomil & Han (2002:248) highlighted that perceived usefulness and perceived ease of use are not sufficient to predict the intention to use technology. In fact, security and privacy are two other important considerations for a user (Luarn & Lin., 2005). Therefore, we adopt three mediating variables related to risk especially: perceived risk with crowdfunding service, perceived risk with online crowdfunding transaction (Lee et al., 2001) and Plagiarism Risk. On the other hand, we adopt one mediating variable related to "perceived trust" (Malhotra et al., 2004).

In order to predict the willingness to use crowdfunding platforms (UCP) by Tunisian novice entrepreneurs, we use simultaneously perceived usefulness and both Perceived Risk and Perceived Trust theories as theoretical basis. All these mediating variables can be illustrated in the proposed research model in Figure 1.

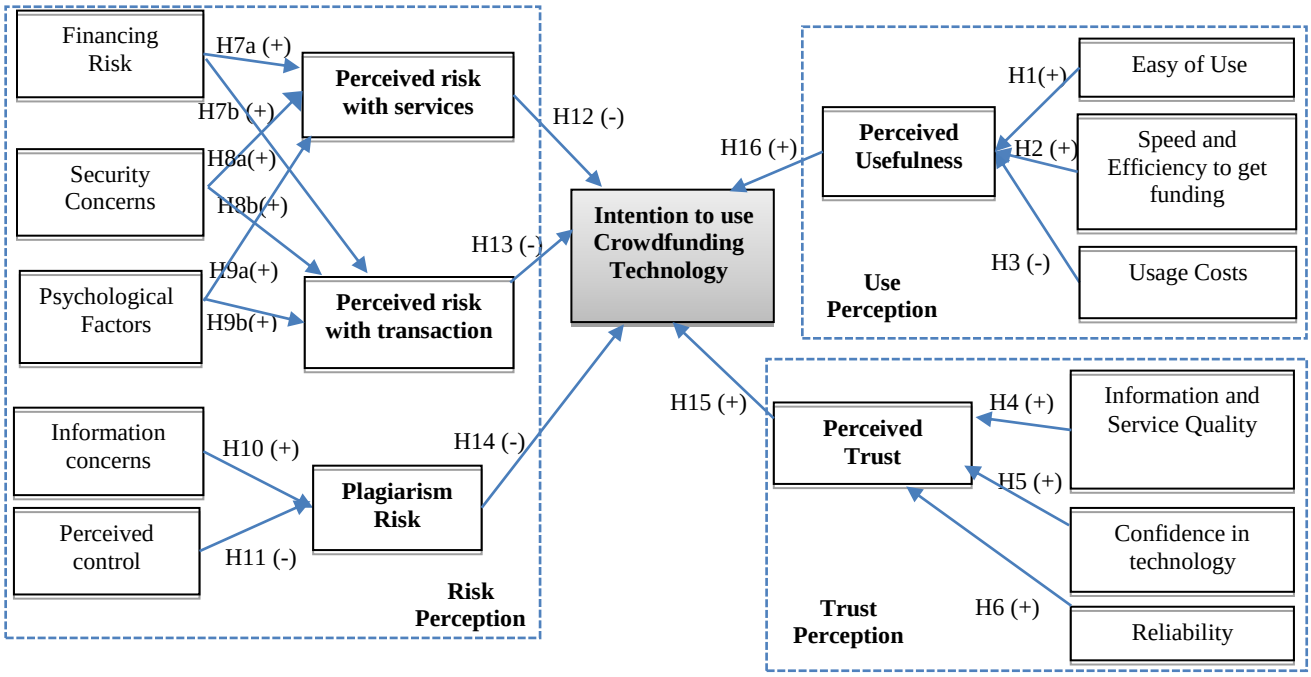

Figure 1. Research model
Source: authors

3.1. Mediating variables

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Usage of crowdfunding technology is the final dependent variable. Three key principles drive the usage of these platforms i.e. how useful it is for novice entrepreneur to use this technology, how much risk is involved in terms of security concerns and given the risk involved can trust still be built upon for entrepreneurs to use crowdfunding platforms.

Perceived Usefulness (PU)

Davis (1993) defined Perceived Usefulness as "the degree to which an individual believes that using a particular system would enhance his or her job performance". Moreover, he defined the attitude toward use of a technology as "the degree to which an individual evaluates and associates the target system with his or her job" (p. 476). Accordingly, this study proposes the following hypothesis:
H16: Crowdfunding platform will get a positive impetus if perceived useful

Davis (1989) recognises two different constructs, Perceived Ease of Use (EU) and Perceived Usefulness (PU). These two latent constructs affect directly the attitude of an individual toward the target technology use and affect indirectly the use of actual system use (Davis, 1993: 477).

Perceived Ease of Use as "the degree to which an individual believes that using a particular system would be free of physical and mental effort". Adams et al. (1992) replicated the research of Davis (1989) to validate these scales that are determined by four beliefs: easy to learn, controllable, easy to become skilful and clear and understandable. Accordingly, this study proposes the following hypothesis:
H1: Ease of use (EU) has positive impact on the intention to use crowdfunding platforms

Referring to the five dimensions of Perceived usefulness proposed by Adams et al. (1992), we recognized as usefulness categories related to crowdfunding service: get funding more quickly, job performance, increase productivity, effectiveness and make fund raising easier. Crowdfunding platforms allows novice entrepreneurs to have direct access to funders and avoid bureaucratic procedures of ordinary financial institutions. Crowdfunding technology increases entrepreneur's chances to get funding especially those who have not access to traditional funding institutions (Banks, Venture Capital, etc.). In addition, crowdfunding platforms could increase the project productivity in case the collected funds exceed the requested amount. In a crowdfunding campaign, the novice entrepreneur is required to introduce his idea and convince the investors to be engaged effectively in his project. The entrepreneur is in direct relation with crowdfunders and he is more implicated and more efficient in his fundraising. Procedures of a crowdfunding campaign are easier and simpler compared to those of obtaining credit from other funding institutions.

Speed and Efficiency (SE) of crowdfunding platforms as it uplifts the performance of getting funding quickly is positively impacts adoption of this technology. The efficiency of crowdfunding systems would involve handling sophisticated platforms, thereby adding value to the entrepreneurs. Therefore, this paper proposes the following hypothesis:
H2: Speed and Efficiency to get funding has a positive influences perceived usefulness in crowdfunding.
The voluntary information disclosure by the entrepreneur increases the confidence of crowdfunders, helps public investors to make better capital allocation decisions, and lowers firms' capital costs (Wang et al., 2015).

Therefore, this paper proposes the following hypothesis:
H3: Usage costs (UC) is associated negatively with the perceived usefulness of crowdfunding platforms.

Perceived trust (PT)

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Zheng et al., (2016) defined trust as a sentiment of security and the disposition to depend on someone or something. Trust is considered as a dynamic process and is built over a certain period of time contributing to satisfaction beyond the effects of the economic outcome (Fam et al., 2004, p. 198). Chen (2006) argued that perceived trust has two means. The first it is a belief, attitude, confidence, or an expectation about honesty of another party's (the funders' trustworthiness in our case). The second consider trust as a behavioral intention including uncertainty. Therefore, this paper proposes the following hypothesis:
H15: Perceived trust (PT) has positive impact on the intention to adopt crowdfunding.

Furthermore, there are three basic dimensions of perceived trust namely: Information and service quality (ISQ), confidence in technology (CT) and reliability (REL) (Kim et al., 2011). According to Zheng et al., (2000) trust is achieved by regular use of reward-based crowdfunding technology. Accordingly, this study proposes the following hypothesis:
H4: Information and service quality has positive effect on perceived trust.
H5: Confidence in technology has positive impact on perceived trust.
H6: Reliability is positively related to perceived trust.

Perceived risk with service (PRS)
Bauer (1960) was the first to introduce the concept of "perceived risk" to marketing literature. Since 1960, extensive researches haves shown that perceived risk affects the behaviour across different cultures. The theory of perceived risk explains that people perceive risk because they face uncertainty and potentially undesirable consequences, so they expect some kind of loss.

Therefore the more risk they perceive the less likely they will intend to try the service. Gierczak et al., (2014) argues that dependence on sources of information reduce crowdfunders' perceived risk with the crowdfunding service adoption. Wang et al., (2018), show from a risk-perception view the concerns of fundraisers' voluntary information disclosure on crowdfunding platforms.
Fundraisers make decisions regarding crowdfunding services to buy. The results of fundraising are often uncertain and the entrepreneur perceives the risk in making a purchase decision. The degree of risk that fundraisers perceive and their own tolerance for risk taking are factors that influence their adoption of crowdfunding platforms. Therefore, this paper proposes the following hypothesis:
H13: Perceived risk with crowdfunding services (PRS) is associated negatively with the intention to use crowdfunding platforms.

Among the five risk categories proposed by Jacoby & Kaplan (1974) and confirmed by Park et al. (2004), we recognized as risk types related to crowdfunding service: functional loss, time loss, financial loss and opportunity loss. Crowdfunding platforms could not function as expected because of technical problems or wrong manipulation. In the rewards-based crowdfunding campaigns such as "All-or-Nothing" (AON), entrepreneurs risk wasting time in case they do not reach the target amount before the deadline of the campaign. As crowdfunding websites are relatively new phenomenon, there is still no guarantee regarding the credibility and the seriousness of the platform transactions. With professional investors such as business angels and venture capitalists, ideas are disclosed in a relatively small circle of investors, each of whom may incur reputational costs from stealing ideas. In contrast, in a crowdfunding campaign entrepreneurs should disclose their entrepreneurial idea in the internet before the product is actually produced making ideas tealing and replicability more likely. This practice stands in sharp contrast with concerns of many entrepreneurs who pursue that innovative ideas need to remain undisclosed. Fundraisers' perceptions of financing risk rise. Accordingly, the following hypotheses are proposed:

H7a: Perceived monetary concerns especially financing risk (FR) is positively related to perceived risk with crowdfunding services.
H8a: Security concerns (SC) is associated positively with perceived risk with crowdfunding services.

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H9a: psychological factors (PF) has positive effect on perceived risk with crowdfunding services.

Perceived risk with transaction (PRT)

Several studies have suggested the lack of security and privacy over an electronic transaction as a frequently recognized obstacle to the use of information and communication technology (Rose et al. 1999; Swaminathan et al. 1999; Lee et al., 2000). Novice entrepreneurs are proposing a plan built around "micro-investors" that they think would minimize the risk of "fraudfunding" (Hazen, 2012). However, fundraising is conditioned by the entrepreneur's disclosure of his project idea to investors. Entrepreneurs face transaction risks such as the lack of security, stealing his idea and privacy concerns. Therefore, this paper proposes the following hypothesis:

H12: Perceived risk with transaction (PRT) via crowdfunding platform is negatively related to the intention of use of this technology.

Perceived risk with transaction is determined by the following dimensions: Privacy, security and non-repudiation. Rose et al. (1999) noted that privacy is vulnerable because messages on the Internet are being passed in a shared domain, and consumers are not yet comfortable with sending personal information across Internet. Moreover, Swaminathan et al. (1999) argued that security concerns with respect to exposure personal information to hackers or unknown individuals, is still a major anxiety for consumers. The possibility that a part can deny an agreement after the transaction represents a risk for entrepreneurs. Accordingly, the following hypotheses are proposed:

H7b: Perceived monetary concerns especially financing risk (FR) is positively related to perceived risk with transaction via crowdfunding platform.
H8b: Security concerns (SC) is associated positively with perceived risk with transaction via crowdfunding platform.
H9b: psychological factors (PF) has positive effect on perceived risk with transaction via crowdfunding platform.

Plagiarism Risk (PR)

The construct of Plagiarism risk (PR) is a belief that negatively impacts entrepreneur idea disclosure (Dinev et al., 2006). In our study, plagiarism risk is considered as an obstacle to information disclosure about the entrepreneurial project, which can lead to project abortionand loss of comparative advantages (Bulgurcu et al., 2010; Xu et al., 2013). In a crowdfunding campaigns, information related to the originality of the entrepreneurial project are critical and are very important for fundraisers. The loss of principal information could hinder the project's concretization of fundraisers (Li et al., 2016). When entrepreneurs divulge information about their entrepreneurial project on crowdfunding platforms, they incur the plagiarism risk or the illegal imitation of their original information by unscrupulous users. In this case, novice entrepreneurs will vacillate to disclose information related to their entrepreneurial projects on the crowdfunding platforms. Therefore, this paper proposes the following hypothesis:
H14: Plagiarism risk (PR) is negatively related to the intention of use of crowdfunding platforms.
Information concerns (IC) are considered as an interesting construct in preceding research on information revelation via social media (Xu et al., 2013). In crowdfunding context, it involves fundraisers' concern about threats to disclose their project's information online and incur the risk of information leakage (Dinev et al., 2006). Bulgurcu et al., (2010) argue that social media users are becoming more and more concerned with the security of their personal information revelation. As a result, as entrepreneurs' information worries rise, their perceptions of plagiarism risk increase. Therefore, we propose the following hypothesis:
H10: Information concerns (IC) have a positive impact on plagiarism risk (PR).

Perceived control (PCL) is another construct representing how much control entrepreneur have over who can perceive their information (Zlatolas et al., 2015). In their empirical study Xu et al., (2008) have shown a negative relationship between Perceived control and information risk. Analogically if fundraisers have more control of their Project's information they divulge, they perceive less risk (Krasnova et al., 2010). Consequently, entrepreneurs want to control who can evaluate their personal information. In fact, as entrepreneurs' control over

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disclosed information grow their plagiarism risk perception decrease (Xu et al., 2008). Accordingly, this paper proposes the following hypothesis:
H11: Perceived control (PCL) is negatively associated with plagiarism risk (PR).

4. Research methodology

4.1. Measurement development

For the operationalization of constructs, we chose to adapt existing validated measurement items identified from the reviewed literature (see Table I), introducing only slight changes to make them pertinent in the context of crowdfunding. The measurement items were formulated as a five point Likert scale, ranging from 1 'strongly agree' to 5 'strongly disagree'. As the measurement items were initially generated in English, we translate the questionnaire in French and Arabic language by adapting standard procedure of translation. Five colleagues in entrepreneurship and entrepreneurial finance who are familiar with survey conception and crowdfunding issues have evaluated the questionnaire. Furthermore, the questionnaire was pre-test by 10 PhD students in entrepreneurship through snowball sampling. The questionnaire testers were asked to comment any vague items, which are subsequently refined. As web based surveys are appropriate when the target are internet users and a short time of responses is required, the participants were first contacted via e-mail and provided an online web link to the questionnaire (Lee et al., 2001). Firstly, the questionnaire was sent by mail to 288 entrepreneurs incubated and hosted in 24 Tunisian business incubators, but the response rate was so low (2.3%). Four weeks later, the questionnaire was sent again to entrepreneurs that did not initially respond which improve the response rate to 10.8%. Thirdly, we boost the response rate to 27.98% by using phone calls. Finally, since an empirical evidence shows that incentives boost participation in the online survey (Li et al., 2006; Zlatolas et al., 2015) we decide to offer pre-paid mobile phone cards as gifts for respondents. Consequently, the final rate of response to the questionnaire was 72.22% (208 of 288 entrepreneurs). According to Hair et al. (2006), using structural equation modeling (SEM) requires a sample size between 200 and 400 to obtain precise results. In addition, Kline (2016) argued that the sample size for SEM should be larger than 200.

The collected test data were used for the exploratory factor analysis (EFA) and reliability analysis with SPSS 25.0. The result of data analysis indicated that the stability coefficients and Cronbach's alphas exceeded 0.7 for the remaining 37 measurement items (Table 1).

Table 1. Measurement items

Construct	Code	Items	References
Information concern	IC	I am concerned that unauthorized people may access my project's information. I am concerned that the crowdfunding platform is collecting too much of my project's information. I am concerned that the crowdfunding platform may share my project's information in an inaccurate manner.	Xu et al. (2013)
Perceived control	PCL	I believe that I have control over how the crowdfunding platform uses my project's information. I believe that I have control over who can access my project's information that I post on the crowdfunding platform. I believe that I have control over the project information that is visible to others on the crowdfunding platform.	Xu et al. (2008)
Plagiarism risk	PR	I perceive a real threat to my project, such as plagiarism and abuse on the crowdfunding platform. I fear that my project will be illegally copied by individuals or organizations without my consent. Overall, I'm afraid that there will be intellectual property disputes in the future operation of my project.	Malhotra et al. (2004)
Perceived Risk with services	PRS	I would find crowdfunding platforms services risky	Lee et al., (2001)
Perceived Risk	PRT	I would find crowdfunding platforms' transactions risky	Lee et al.,

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with transaction			(2001)
Financing risk	FR	My project will not attract investors The crowdfunding platform may not help me obtain adequate investments within the pre-set time limit. Considering the current level of financing performance of the crowdfunding platform, my financing process will be somewhat difficult.	Featherman & Pavlou (2003)
Security Concerns	SC	I believe that my confidential information is kept secure There is an appropriate procedure in crowdfunding platform to prevent accidental loss of data When using crowdfunding platform, I am sure that certain managerial and technical procedures exist to protect my personal information In crowdfunding platform, if a certain transaction is performed, it never could be denied by party	Lee et al., (2001) Taherdoost (2017) Taherdoost & Sahibuddin (2015)
Psychological factors	PF	Usage of crowdfunding platforms seems inherently risky to me I lack confidence and perceive risk in crowdfunding platform since platform itself does not promote it	Tan & Teo, (2000)
Perceived usefulness	PU	Using a crowdfunding platform would enable me to get funding more quickly Using a crowdfunding platform would improve my chances to get funding Using a crowdfunding platform would increase the productivity of my project in case the funds collected exceed the requested amount Using a crowdfunding platform would enhance my effectiveness on getting funding Using a crowdfunding platform would make it easier for me to get funding	Davis (2003)
Ease of use	EU	It would be easy for me to learn how to use a crowdfunding platform I would find it easy to get a crowdfunding platform to do what I want it to do It would be easy for me to remember how to use a crowdfunding platform My interaction with a crowdfunding platform would be clear and understandable	Suh & Han (2003)
Speed and efficiency	SE	I do not find Crowdfunding technology time consuming With crowdfunding platform, I am on- the-go and can have funds with the touch of a button	Taherdoost (2018)
Usage cost	UC	I am not reluctant to use crowdfunding platform because I can not support any charge in case of failure of the campaign I am not reluctant to use crowdfunding platform because Crowdfunding platform's owner charges me for using it	
Perceived trust	PT	Crowdfunding platforms have integrity Crowdfunding platforms are reliable Crowdfunding platforms are trustworthy	Malhotra et al., 2004
Information and service quality	ISQ	Crowdfunding does not annoy me even if I have to remember different passwords or codes It would be easy to surf and access different services in crowdfunding platforms In crowdfunding platforms "how to use guides" are provided on the website	Malhotra et al., 2004
confidence in crowdfunding technology	CT	I prefer launching a crowdfunding campaign rather than raising funds directly from my acquaintances I trust the current generation of online services including crowdfunding platforms	Malhotra et al., 2004
Reliability	REL	Using crowdfunding technology enhance correct transaction records Using crowdfunding technology enhance zero-error in services	Malhotra et al., 2004
Intention to use	UC	Overall speaking, the effect of using crowdfunding platforms makes me feel satisfied I predict I would use crowdfunding platforms in the near future I plan to use crowdfunding platforms in the near future My intention would be to use crowdfunding platforms rather than traditional financing tools	Wu, Tao, and Yang (2008) Venkatesh et al. (2003),

Information about the respondents' demographics are listed in Table 2. The demographic characteristics of our sample shows different demographic factors, including gender, age, business activity, diploma and education background.

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Table 2. Sample demographics (n=208).

Measures	Items	Frequency	Percentage %
Gender	Male	132	63.46
	Female	76	36.54
Age	Under 30	134	64.42
	30-40	56	26.92
	40 or above	18	8.66
Educational level	Bachelor	113	54.33
	Master	21	10,1
	Engineering	69	33.17
	PhD	5	2.4
Educational background	Human sciences	12	5.76
	Computer sciences	141	67.78
	Medical sciences	4	1.92
	Business & Economics	46	22.11
	Tourism Management	5	2.40
Business activity	Services	79	37.98
	Industry	125	60,09
	Agriculture	4	1.92

5. The results

This study outlines a research model with five latent constructs, each of them was measured by three or more variables. Data analysis was carried out using SEM as a flexible tool in scrutinising causal relationships between multiple-item constructs (Kline, 2016). The benefits of SEM analysis consist of assumptions that are more flexible and fewer measurement errors permitted by several indicators per construct (Kline, 2016). Before testing our research model, we performed manipulation to validate the treatment. We use a two-step process to specify a measurement model in the confirmatory factor analysis (CFA), then we test our latent structural model established from the measurement model (Anderson and Gerbing, 1988).

Measurement model validation

The 208 responses used for data analysis indicate a satisfactory sample size about 72.22%. We use confirmatory factor analysis (CFA) to assess our measurement model and to ensure validity and reliability (Brown, 2015). Overall goodness-of-fit indices for the initial measurement model showed that the fit was acceptable, with the chi-square/df ratio ($\chi 2$/d.f.) of 1.76, root-mean-squared error of approximation (RMSEA= 0.05), comparative fit index (CFI= 0.93), goodness of fit index (GFI=0.92), adjusted goodness of fit index (AGFI=0.92), normed fit index (NFI=0.94), Bollen's incremental-fit index (IFI=0.95), comparative fit index (CFI=0.95) all having acceptable fit levels.

To evaluate the reliability of the constructs we calculate Cronbach's α and in order to measure internal consistency we determine composite reliability (CR) (Fornell & Larcker, 1981). In fact, for a construct to have good reliability, Cronbach's α should be superior to 0.7, while internal consistency (CR) should be at least 0.7 (Hair et al., 1998). The Table 3 indicates a good reliability and shows that all values exceeded generally accepted values. Construct validity includes convergent validity and discriminant validity. Convergent validity measures whether items effectively reflect their corresponding factors (Brown, 2015).

Table 3. Standardized item loadings, AVE, CR and Cronbach's α values.

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Constructs	Items	Standardized item loading	CR	AVE	Cronbach's α
Perceived usefulness	*PU4*	0.858	0.8742	0.7341	0.850
	PU2	0.846			
	PU5	0.838			
	PU1	0.836			
	PU3	0.822			
Perceived trust	*PT1*	0.932	0.9565	0.8871	0.946
	PT3	0.928			
	PT2	0.907			
Plagiarism risk	*PR2*	0.836	0.8432	0.6564	0.824
	PR3	0.834			
	PR1	0.828			
Financing risk	*FR2*	0.886	0.8675	0.7332	0.843
	FR3	0.866			
	FR1	0.843			
Psychological factors	*PF2*	0.941	0.942291	0.8339	0.944
	PF1	0.886			
Security concerns	*SC1*	0.849	0.8291	0.8124	0.921
	SC2	0.831			
	SC3	0.829			
	SC4	0.812			
Information concerns	*IC2*	0.879	0.9246	0.7967	0.881
	IC1	0.866			
	IC3	0.857			
Percived control	*PC3*	0.885	0.9132	0.7614	0.842
	PC1	0.862			
	PC2	0.854			
Speed and efficiency	*SE1*	0.887	0.9321	0.7753	0.832
	SE2	0.874			
Usage costs	*UC1*	0.867	0.9426	0.7821	0.863
	UC2	0.843			
Reliability	*REL1*	0.891	0.9365	07859	0.857
	REL2	0873			
Easy of use	*EU1*	0.876	0.9115	0.7525	0.832
	EU3	0.871			
	EU4	0.866			
	EU2	0.852			
Information & service quality	*ISQ1*	0.892	0.9203	0.7731	0.844
	ISQ2	0.879			
	ISQ3	0.874			

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Confidence in technology	*CT1*	0.873	0.9119	0.7648	0.832
	CT2	0.857			
Intention to use	*IU1*	0.966	0.9674	0.8984	0.958
	IU2	0.957			
	IU3	0.931			
	IU4	0.912			

In this study we use average variance extracted (AVE) to assess the convergent and discriminant validity of the constructs' measurement. To confirm convergent validity, the factor loading of every item should be superior to 0.7, and each construct should have the CR value larger than 0.7, and the AVE value greater than 0.5 (Fornell & Larcker 1981). As presented in Table 3, all factor loadings for the items are greater than 0.7 and were significant at the 0.001 level, all AVEs are superior than 0.5 and the CRs exceeded 0.7. Consequently, the scale showed good convergent validity. Therefore, to measure if two factors are significantly different we use discriminant validity (Kline, 2016).

Discriminant validity is shown when:

1. measurement items load more strongly on their assigned construct rather than on the other constructs in the CFA, and
2. the square root of the Average Variance Extracted (AVE) of each construct is greater than its correlations with the other constructs (Hair et al., 1998).
3. As shown in Table 4, the square root of the AVE for each construct is greater than the correlation shared among constructs in the research model, thus providing evidence of discriminant validity.

Table 4. The square roots of AVEs and factor correlation coefficients.

Constr.ι	PU	EU	SE	UC	PT	ISQ	CT	REL	PRS	PRT	FR	SC	PF	PR	IC	PC	UCT
PU	**.843**																
EU	.157**	**.929**															
SE	.028*	.107**	**.956**														
UC	-.097**	-.068*	.003*	**.930**													
PT	.056*	.065*	.052*	-.045*	**.927**												
ISQ	.037*	-.***	.051*	.056*	.087*	**.903**											
CT	.676**	.437***	.249**	.097*	.236***	.074*	**.824**										
REL	.094*	.171***	.083*	-.***	.024*	.748**	.165**	**.814**									
PRS	-.065*	-.050*	-.048*	-.267*	-.020*	.316**	-.029*	-.314***	**.876**								
PRT	-.066*	-.045*	-.061*	-.345*	-.012*	.015*	.618***	-.702***	.613***	**.872**							
FR	.088*	-.***	.062*	.367**	.125**	.736**	.154**	.084*	-.058*	-.078*	**.924**						
SC	.076*	-.043*	-.038*	.267***	-.014*	.315**	-.021*	-.312***	.084*	.284***	.076*	**.842**					
PF	.056*	-.040*	-.037*	.255***	-.010*	.302**	-.018*	-.052*	.234***	-302***	.062*	.028*	**.886**				
PR	-.043*	-.038*	-.029*	.041*	-.022*	.408**	-.039*	-.302***	-.405***	-.617***	-.052*	.092*	.382***	**.866**			
IC	-.052*	-.031*	.027*	.035*	-.710***	.602**	-.018*	.082*	-.533***	-.408***	.072*	402***	.052*	.612***	**.901**		
PC	-.557*	.052*	.045*	.052*	-.018*	.021*	-.026*	.302***	.038*	-.516***	-.161**	324***	.077*	.531***	.432***	**.943**	
UCT	.046*	.065*	-.037*	-.***	-.062*	.014*	-.037*	-.302***	-.336***	-.403***	.031*	301***	.063*	-.712**	.157***	.138***	**.837**

*: p<0.05; **: p<0.01; ***: p<0.001.

Note: Values on diagonal are the square root of Average Variance Extracted (AVE) between the constructs and their measures. However, off-diagonal values are correlations between constructs.

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5.1. Structural model validation

After obtaining an acceptable measurement model, we apply a structural equation modelling approach to test our hypotheses described in our research model. The structural model is a tool to detect if the proposed conceptual model was providing an acceptable fit to the empirical data. Table 5 compares between the recommended and actual values of the fit indices. With the chi-square/df ratio (χ2/d.f.) of 1.74, root-mean-squared error of approximation (RMSEA= 0.04), comparative fit index (CFI= 0.93), goodness of fit index (GFI=0.91), adjusted goodness of fit index (AGFI=0.91), normed fit index (NFI=0.94), Bollen's incremental-fit index (IFI=0.96), comparative fit index (CFI=0.96) all indicating that the model have an acceptable fit to data as suggested by Kline (2016).

Table 5. Comparison of model fit indices for measurement model and structural model.

Fit indices	Criterion	Measurement model		Structural model
		Initial model	Respecified model	
$\chi^2/d.f.$	<3.00	1.76	1.67	1.74
GFI	>0.9	0.92	0.91	0.91
AGFI	>0.9	0.92	0.91	0.91
NFI	>0.9	0.93	0.95	0.94
IFI	>0.9	0.95	0.97	0.96
CFI	>0.9	0.93	0.97	0.96
RMSEA	<0.06	0.05	0.04	0.04

Table 6 shows findings of the structural model analysis. The majority of the paths are significant and are in the expected direction. The path coefficients of hypotheses 1, 3, 4, 5, 6, 7a, 7b, 9a, 9b, 10a, 10b, 12, 13, 14 and 16 were significant at a level of $p<0.001$, indicating support for these hypotheses. The path coefficient of hypothesis 2 and 15 was significant at a level of $p<0.01$, thus indicating support for this hypothesis. However, hypotheses 8a and 8b were rejected. According to the results, Plagiarism risk has a larger direct influence on intention to adopt crowdfunding technology (β= -.577, $p<0.001$) followed by Perceived risk with services (β= -0.385, $p<0.001$), Perceived usefulness (β=0.359, $p<0.001$) and Perceived risk with transaction (β= -0.112, $p<0.001$). Interestingly, information concerns were found to have the largest direct influence (β=0.512, $p<0.001$) on plagiarism risk, followed by perceived control (β= -0.131, $p<0.001$). Therefore, psychological factors have a direct influence on both perceived risk with services (β=0.598, $p<0.001$) and perceived risk with transaction (β=0.463, $p<0.001$). Thus, Financing risk have a direct influence on both perceived risk with services (β=0.296, $p<0.001$) and perceived risk with transaction (β=0.147, $p<0.001$). In addition, usage costs have a larger direct influence on Perceived usefulness (β= -0.612, $p<0.001$) followed by Ease of use (β= 0.445, $p<0.001$) and Speed & efficiency (β= 0.356, $p<0.01$). However, Reliability (β=0.465, $p<0.001$), followed by Confidence in technology (β=0.325, $p<0.001$) and Information and service quality (β=0.251, $p<0.001$), have the largest direct influence on perceived trust. In Figure 2 the validated structural model is presented.

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Table 6. Results of hypothesis testing

No.	Hypothesized path	Estimate	S.E.	C.R.	P value
H12	Perceived risk with services → intention to use	-.385	.016	-8.618	.000***
H13	Perceived risk with transaction → intention to use	-.112	.013	-6.486	.000***
H14	Plagiarism risk→ intention to use	-.577	.067	-5.534	.000***
H16	Perceived usefulness → intention to use	.359	.046	15.643	.000***
H15	Perceived trust → intention to use	.282	.018	7.644	.006**
H10a	Information concerns→ Plagiarism risk	.512	.023	12.188	.000***
H10b	Perceived control→ Plagiarism risk	-.131	.012	-11.432	.000***
H7a	Financing risk→ Perceived risk with services	.296	.017	10.617	.000***
H8a	Security concerns→ Perceived risk with services	.186	.014	.045	.565ns
H9a	Psychological factors→ Perceived risk with services	.598	.013	8.834	.000***
H7b	Financing risk→ Perceived risk with transaction	.147	.027	12.163	.000***
H8b	Security concerns→ Perceived risk with transaction	.284	.029	1.486	.990ns
H9b	Psychological factors→ Perceived risk with transaction	.463	.013	18.631	.000***
H1	Ease of use → Perceived usefulness	.445	.015	17.623	.000***
H2	Speed and efficiency → Perceived usefulness	.356	.029	6.221	.004**
H3	Usage costs → Perceived usefulness	-.612	.068	-7.661	.000***
H4	Information and service quality → Perceived trust	.251	.014	5.748	.000***
H5	Confidence in technology → Perceived trust	.325	.012	6.316	.000***
H6	Reliability → Perceived trust	.468	.019	8.812	.000***

*: p<0.05; **: p<0.01; ***: p<0.001; ns: not significant.

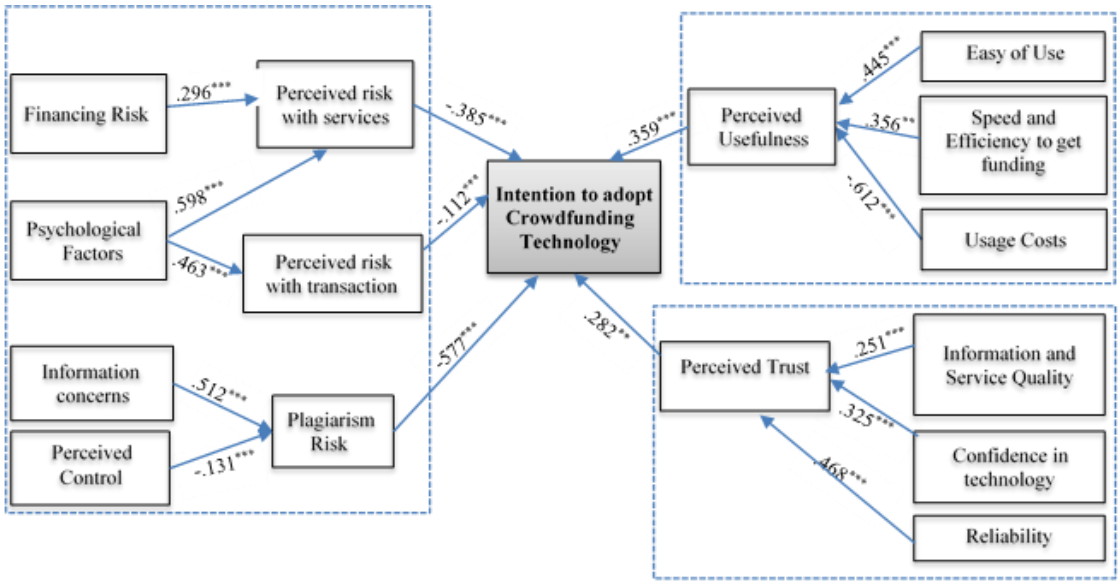

Figure 2. The validated structural model
Source: authors

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6. Discussion

Plagiarism risk has negative effects on intention to adopt crowdfunding platforms (β= -0.577, p<0.001), showing that it is a critical determinant of acceptance to use of crowdfunding technology owing to the entrepreneur's fear of voluntary information disclosure. This result is in accordance with previous studies (Wang et al., 2018), which have argued that entrepreneurs as fundraisers are worried about the originality or the design of their project to be illegally copied by unethical users without their prior notification or agreement. Consequently, the intention to use crowdfunding platform will decrease if they recognize a high risk of plagiarism (Stutzman et al., 2011). Undeniably, the risk taken by a novice entrepreneur may influence its funding choices. As a result, various studies have evidenced risks of idea-stealing related to the often required circulation of ideas (Biais & Perotti, 2008), such problem is qualified by Cooter & Edlin (2013) as "double trust dilemma of innovation" (Schwienbacher, 2017).

Perceived risk with services (β= -0.385, p<0.001) and perceived risk with transaction (β= -.112, p<0.001) was found to have a negative effect on voluntary use of crowdfunding platforms by Tunisian entrepreneurs. Furthermore, psychological factors have a direct influence on both perceived risk with services (β=0.598, p<0.001) and perceived risk with transaction (β=0.463, p<0.001). This result means that entrepreneurs' cognition of risk and their intention to use crowdfunding services are influenced by their psychological schemes. This finding is in line with the results obtained by Hollenbaugh & Ferris (2014), who found that online users adopt technology services to disclose their information based on extrinsic motivations. In the same way, entrepreneurs (fundraisers) believe to run an unsuccessful crowdfunding campaign once they share online information about their entrepreneurial project. Thus, they know for a fact that if they do not share details about their projects to fascinate potential funders, they cannot be entirely funded. Consequently, voluntary adoption of crowdfunding platforms depends on both risk perception with services and transaction upon crowdfunding platforms in such a way a higher risk perception with services discourage willingness to use this technology and to disclose project details voluntarily.

Information concerns were found associated positively with plagiarism risk (β=0.512, p<0.001), showing that it plays an important role in the intention to use of crowdfunding technology. This result is consistent with the study of Bulgurcu et al. (2010) indicating a relation between information concern which, is considered as a personal disposition and privacy risk. This result indicates that if information concerns are high, entrepreneurs will be interested to protect their entrepreneurial project from plagiarism and therefore will be less willing to use crowdfunding platform.

Perceived control was found to have a negative influence on plagiarism risk (β= -0.131, p<0.001). This finding is in accordance with prior studies in the social networking service (SNS) testing the link between perceived control and information revelation (Zlatolas et al., 2015). Risk concerns about the revelation of sensitive project details can be reduced by different uses of information control. This result shows that when entrepreneurs have control on the use of their entrepreneurial project information, they become less worried about the stealing risks of their project proposals.

Financing risk was found associated positively with both perceived risk with services (β=0.296, p<0.001) and perceived risk with transaction (β=0.147, p<0.001). This result is consistent with the study conducted by Nanda & Rhodes-Kropf, (2016) indicating that financing risk encompasses the possible failure to find future funding for novice entrepreneurs. When entrepreneurs launch a crowdfunding campaign, they may also fear financing risk. Thus, entrepreneurs could be unable to attain their financing objective owing to the revelation of irrelevant information related to their entrepreneurial project (Nanda and Rhodes-Kropf, 2016). In fact, if entrepreneurs as fundraisers did not arouse the interest of crowdfunders as investors, they may ask themselves if they have

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disclosed enough relevant information (Li et al., 2016). As a result, to satisfy crowdfunders' expectations and fascinate them, entrepreneurs may divulge more information about their entrepreneurial projects. Consequently, a high perceived risk with crowdfunding services and transaction usually results in more financing risk perception. Usage costs was found related negatively to Perceived usefulness (β= -0.612, $p<0.001$). This funding is in line with previous studies indicating that usage costs have acted as an obstacle to technology acceptance (Park & Kim, 2016; Yu, 2012). Many researches argued that usage costs and technology adoption are associated negatively according to adoption risks model (e.g., Zhou, 2011; Venkatesh et al., 2012). Some platforms claim a significant percentage (more than 10%) of raised funds as commission for their services. While the crowdfunding service is perceived to be useful by entrepreneurs, usage costs will influence the usage intention as an adoption obstacle.

Perceived easy to use has a positive relationship (β= 0.445, $p<0.001$) and direct effect with perceived usefulness of entrepreneurs to use crowdfunding technology. In addition, Perceived usefulness has an immediate effect on the intention to use crowdfunding platforms (β=0.359, $p<0.001$). This finding is consistent with the studies conducted by Bin Mohd &Thaker (2018) and Bin Mohd et al., (2018) showing both perceived usefulness and perceived ease of use are directly significant in influencing the crowdfunder's intention to adopt the crowdfunding-waqf model (CWM) in Malaysia. In the same way, speed and efficiency was found associated positively with perceived usefulness (β= 0.356, $p<0.01$). This result is in line with the study of Taherdoost (2018) indicating that speed affect positively the acceptance of e-service technology.

Reliability was found have the largest positive affect on perceived trust (β=0.465, $p<0.001$), followed by Confidence in technology (β=0.325, $p<0.001$) and Information and service quality (β=0.251, $p<0.001$). These findings are consistent with recent studies (Esraa et al., 2018; Wangari & Karugu, 2018) indicating that customers trust online services' platforms because their confidence in technology, reliability and the quality of the provided information and service. Wang et al., (2018) talk about the increasing of trust if there is ready access to information and services. The information and service quality should facilitate the ease of use of crowdfunding service applications.

The relationship between Security concerns and Perceived risk with services was not verified (β=0.186, p=0.565). In addition, the relationship between Security concerns and Perceived risk with transaction was not confirmed (β=0.284, p=0.990). This result is not consistent with that of the study conducted by Nikkhah et al. (2018). One plausible explanation is that crowdfunding in Tunisia is still at an embryonic stage of development; thus, fundraisers may place much security concerns than entrepreneurs in using crowdfunding platform as they are the true fund purveyors. Moreover, entrepreneurs have no fear about the security of transferring fund from the fundraiser account to the platform.

Conclusions and implications

Theoretical implications

This study makes many contributions to the literature on crowdfunding technology adoption among novice entrepreneurs. First, while technology adoption is a very interesting research issue and has been widely studied, the topic has not been thoroughly investigated in the context of crowdfunding. However, existing literature on the use of crowdfunding platforms focus essentially on voluntary information disclosure by entrepreneurs (Li et al., 2016), thus neglecting the importance of crowdfunding technology adoption in the context of developing country where this funding tool is underdeveloped. Our current research fills this knowledge gap. This contribution aimed at investigating the factors affecting entrepreneurs' behavior intention to use crowdfunding platforms from a perspective of three distinct perception: use, trust and risk. To the best of our knowledge, this empirical study is among the first researches to scrutinize the determinants of entrepreneurs' behavior intention of voluntary use of crowdfunding platforms in developed country.

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Second, prior studies on technology adoption have often focused only on the classic TAM model as their theoretical foundation. However, risk perception with service, transaction and plagiarism was neglected. Entrepreneurs are reticent about using crowdfunding platforms to disclose information related to their entrepreneurial project because of different types of perceived risks. Consequently, perceived risk appears as a conspicuous obstacle to entrepreneurs' information disclosure behavior (Wang at al., 2015; Li et al., 2016; Wang et al., 2018). Thus, this research provides some of the first evidence for the basic validity of the classic TAM model. The findings show that perceived risks affect crowdfunding adoption among novice entrepreneurs and specially their information disclosure behavior. The application of a modified TAM model to a study of crowdfunding adoption expands the understanding of risk perception in explaining entrepreneurs' behavior.

Third, the current study provided evidence to clarify the three dimensions of risk perceptions in the context of crowdfunding especially. We divided perceived risk into perceived risk with services, perceived risk with transaction and plagiarism risk, which are supposed to form the essential of risk perceptions when an entrepreneur uses crowdfunding platform and discloses information about his entrepreneurial project. However, most of the carried studies regarding TAM model have considered perceived risk with other factors as an integral variable to explore user's behavior intention. TAM model was extended in this research by exploring different risks on entrepreneurs' intention to use crowdfunding platforms and their information disclosure behavior. Furthermore, we revealed the interesting role of plagiarism risk in predicting entrepreneurs' intention to adopt crowdfunding technology.

Practical implications

From a practical level, findings of this study can serve as a guide to entrepreneurship educators and counsellors on how to understand entrepreneurs' behaviour intention to use crowdfunding platforms. In addition, results will support crowdfunding services providers to determine the significant variables encouraging entrepreneurs' voluntary intention to adopt crowdfunding technology and to disclose information when running a crowdfunding campaign. Crowdfunding service providers have to be conscious that developing the appropriate strategies depends on both individual and contextual factors of their environment. Our findings indicate that entrepreneurs should expect differences in risk perceptions depending on their personality traits and their psychological factors. Explicitly, plagiarism risk and financing risk affect significantly entrepreneurs' intention to use crowdfunding platforms and to disclose voluntarily information of their entrepreneurial project. Consequently, crowdfunding services providers have to be aware of these risks to enhance entrepreneurs' behaviour to adopt this technology. Entrepreneurs may be vexed by disclosing their entrepreneurial project information. Thus, they require more guarantees for confidentiality of their project information. As a result, crowdfunding platforms should be customised to provide such guarantees to entrepreneurs when posting their project information on crowdfunding platforms. Perceived control is an additional interesting topic that have to be addressed. A perceived level of control over shared information increases the ability and the confidence of entrepreneurs as fundraisers to manage it and then reduces their perceptions of plagiarism risk. Crowdfunding services providers have to assure confidentiality on their platforms to encourage entrepreneurs divulging their project information according to their intention. The perceived control of entrepreneurs over their project information will increase, if they can choose which information is observable and share or retract freely their project's information.

In addition, innovative entrepreneurs can construct a competitive advantage and differentiate themselves from competitors. Nevertheless, innovative projects involved higher levels of plagiarism risk. Deterring imitation using legal barriers such as patent, copyrights, trademarks are a very interesting concern for both entrepreneurs and Crowdfunding service providers when uploading project's information on the crowdfunding platform. Therefore, to resolve these problems, crowdfunding service providers can remind entrepreneurs of their delicate information and assist them to patent their product. For the meantime, crowdfunding service providers have to tighten procedures of project evaluation and strengthen its operations management.

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Considering the significant impact of perceived usefulness and perceived trust on entrepreneurs' intention bahavior, crowdfunding service providers should express and publish procedures, policies and security measures of their platforms utilization to standardize entrepreneurs' information revelation behavior. Crowdfunding service providers should enforce online security tools and include exhaustive reports on their platforms to protect rights of their users. They can explain which information will be revealed and which is optional. As a result, crowdfunding service providers must increase the perceived usefulness and enhance the perceived trust.

Limitations and suggestions for future research

TAM model is used to detect human resistance for adopting new technologies and its robustness was confirmed by several studies. It explains and predicts IT acceptance and facilitate design changes before users have experience with a system (Dongwon Lee et al. 2001. P: 110). However, the findings of this study have some limitations that will provide opportunities for further research. First, our empirical study is restricted to a Tunisian entrepreneurs' sample. It is wiser to test whether the findings are valid in other developing countries. Thus, we should take into account both cultural, social and technological differences between countries. A very important extension of this research would be to compare entrepreneurs' intention to use crowdfunding platforms and their willingness to disclose project's information in different developing countries to scrutinize whether the important factors differ. Another future extension of this study would be to expand the data set to cover not only nascent entrepreneurs hosted in business incubator.

Second, other factors could influencing entrepreneurs' intention to use crowdfunding platforms that are not considered in the presented model. Future study can include to our model factors related to personal traits and demographic characteristics of entrepreneurs, which have been confirmed as effecting information disclosure on online services. Thus, further research may extend the TAM model by considering additional factors.

Third, the questionnaire data were collected from 208 entrepreneurs at a single point in time. A longitudinal study would more credibly investigate how entrepreneurs' intention to adopt crowdfunding technology changes over time.

References

Adams, D.A., Nelson, R.R., and Todd, P.A. (1992). Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication. *MIS Quarterly* 16(2), 227-247.

Ahlers, G.K., Cumming, D., Günther, C. and Schweizer, D. (2015). Signaling in equity crowdfunding. *SSRN Electronic Journal*, 39(4), 955-980. https://doi.org/10.1111/etap.12157

Ajzen, I., Fishbein, M. (1977). Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research. *Psychological bulletin*, 84(5), 889-918.

Astrauskaitė, I., Paškevičius, A. (2018). An analysis of crowdfunded projects: KPI's to success. *Entrepreneurship and Sustainability Issues*, 6(1), 23-34. http://doi.org/10.9770/jesi.2018.6.1(2)

Bauer, R.A. (1960). Consumer behavior as risk taking, *Proceedings of the 43rd National Conference of the American Marketing Association*, pp. 389-398.

Belleflamme, P. Lambert, T., Schwienbacher, A. (2011). Crowdfunding: Tapping the Right Crowd, in *International Conference of the French Finance Association* (AFFI), May 11-13 http://dx.doi.org/10.2139/ssrn.1578175

Belleflamme, P., Lambert, T., Schwienbacher, A. (2013). Individual crowdfunding practices. *Venture Capital*, 15(4), 313-333.

Biais, B., Perotti, E. (2008). Entrepreneurs and New Ideas. *The RAND Journal of Economics*, 39(4), 1105-1125

Bin Mohd, M-A., Thaker, T., Pitchay, A-A. (2018). Modeling crowdfunders' behavioral intention to adopt the crowdfunding-waqf model (CWM) in Malaysia: The theory of the technology acceptance model. *International Journal of Islamic and Middle Eastern Finance and Management* https://doi.org/10.1108/IMEFM-06-2017-0157

Bin Mohd, M-A., Thaker, T. (2018). Factors influencing the adoption of the crowdfunding-waqf model (CWM) in the waqf land development, *Journal of Islamic Marketing*, 9(3), 578-597. https://doi.org/10.1108/JIMA-05-2016-0043

Bretschneider, U., Knaub, K. and Wieck, E. (2014). Motivations for crowdfunding: What drives the crowd to invest in start-ups? *Twenty Second European Conference on Information Systems* https://www.jstor.org/stable/25474413

Brown, T.A. (2015). *Confirmatory Factor Analysis for Applied Research*, 2nd edition, New York: The Guilford Press, 234 p.

Bulgurcu, B., Cavusoglu, H. and Benbasat, I. (2010). Understanding emergence and outcomes of information privacy concerns: A case of Facebook, *International Conference on Information Systems*, St Louis.

Cambridge Centre for Alternative Finance/KPMG (2016). Sustaining Momentum: The 2nd European Alternative Finance Industry Report, available at: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2016/09/sustaining-momentum.pdf

Compeau, D-R, & Higgins, C-A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, 19(2), 189-211.

Chirisa, I., Mukarwi, L. (2018). *A Comparative Analysis of Africa and Chinese Crowdfunding Markets*, In, Benna, U-G. & Benna, A-U, *Crowdfunding and Sustainable Urban Development in Emerging Economies*, IGI Global.

Craciun, G. (2018). Choice Defaults and Social Consensus Effects on Online Information Sharing: The Moderating Role of Regulatory Focus. *Computers in Human Behavior* https://doi.org/10.1016/j.chb.2018.06.019

Davis, F-D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340.

Davis, F.D., Bagozzi, R.P., Warshaw, P-R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982-1003.

Davis, F.D., Richard, P. Bagozzi, P.R. Warshaw. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace, 22(14), 1111-1132 https://doi.org/10.1111/j.1559-1816.1992.tb00945.x

Dinev, T., Bellotto, M., Hart, P., Russo, V. et al. (2006). Internet users' privacy concerns and beliefs about government surveillance: An exploratory study of differences between Italy and the United States. *Journal of Global Information Management*, 14(4), 57-93.

Esraa, A. Yufei, Y., Milena, H. (2018). Understanding Trust in Online Reviews - Research in Progress. *SIGHCI 2018 Proceedings*. https://aisel.aisnet.org/sighci2018/24

Featherman, M. and Pavlou, P. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human-Computer Studies*, 59(4), 451-474. https://doi.org/10.1016/S1071-5819(03)00111-3

Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(4), 39-50.

Gierczak, M. M., Bretschneider, U. & Leimeister, J. M. (2014). Is all that Glitters Gold? Exploring The Effects of Perceived Risk on Backing Behavior in Reward-based Crowdfunding. In: *International Conference on Information Systems (ICIS)*, Auckland, New Zealand.
Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998). *Multivariate Data Analysis*, 5th edition. New Jersey: Prentice-Hall, p.367.

Hair, J.F., Black, B., Babin, B., Anderson, R.E. and Tatham, R.L. (2006). *Multivariate Data Analysis*, 6th ed., Prentice Hall, Upper Saddle River, NJ., p. 267.

Hollenbaugh, E. E. and Ferris, A. L. (2014). Facebook self-disclosure examining the role of traits, social cohesion and motives. *Computers in Human Behavior*, 30(1), 50 -58. http://dx.doi.org/10.1016/j.chb.2013.07.055

Howe, J. (2006). The Rise of Crowdsourcing. Wired, 14. http://www.wired.com/wired/archive/14.06/crowds.html

Kaplan, L.B., Szybillo, G.J. and Jacoby, J. (1974). Components of perceived risk in product purchase: A cross-validation. *Journal of Applied Psychology*, 59(3), 287-291. http://dx.doi.org/10.1037/h0036657

Kim, M-J., Chung, N., Lee, C-K. (2011). The effect of perceived trust on electronic commerce: Shopping online for tourism products and services in South Korea. *Tourism Management*, 32, 256–265. http://dx.doi.org/10.1016/j.tourman.2010.01.011

Kleemann, F., Vob, G., Rieder, K. (2008). Under paid Innovators: The Commercial Utilization of Consumer Work through Crowdsourcing. *Science Technology and Innovation Studies*, 4, 5-26.

Kline, R.B. (2016). *Principles and Practice of Structural Equation Modeling*, 4th edition, New York: The Guilford Press, p. 326.

Krasnova, H., Spiekermann, S., Koroleva, K. (2010). Online social networks: Why we disclose. *Journal of Information Technology*, 25(2), 109-125. https://doi.org/10.1057/jit.2010.6

Kromidha, E. and Robson, P. (2016). Social identity and signalling success factors in online crowdfunding. *Entrepreneurship & Regional Development*, 1-25. https://doi.org/10.1080/08985626.2016.1198425

Li, D., Browne, G.J. and Chau, P.Y.K. (2006). An empirical investigation of web site use using a commitment-based model, *Decision Sciences*, 37(3), 427-444. https://doi.org/10.1111/j.1540-5414.2006.00133.x

Li, X.C., Tang, Y.H., Yang, N.R., Ren, R.Y. et al. (2016). The value of information disclosure and lead investor in equity-based crowdfunding: An exploratory empirical study, *Nankai Business Review International*, 7(3), 1-25. https://doi.org/10.1108/NBRI-01-2016-0002

Lee, D., Park, J., Ahn, J. (2001), On the Explanation of Factors Affecting E-Commerce Adoption, *Proceedings of the 22nd International Conference on Information Systems*, New Orleans, Louisiana, pp. 109-120.

Malhotra, N-K., Kim, S-S., Agarwal, J. (2004). Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Causal Model. *Information Systems Research*, 15(4), 336-355. https://doi.org/10.1287/isre.1040.0032

Mollick, E. (2014). The dynamics of crowdfunding: an exploratory study. *Journal of Business Venturing*, 29(1), 1-16. https://doi.org/10.1016/j.jbusvent.2013.06.005

Moore, G.C., Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2(3), 192-222. https://doi.org/10.1287/isre.2.3.192

Nanda, R. and Rhodes-Kropf, M. (2016). Financing risk and innovation. *Management Science*, 63(4), 901-918. https://doi.org/10.1287/mnsc.2015.2350

Nikkhah, H-R., Grover, V., Sabherwal, R. (2018), Why Do Users Continue to Use Mobile Cloud Computing Applications? A Security-Privacy. *Proceedings of the 13th Pre-ICIS Workshop on Information Security and Privacy*, San Francisco, December 13, 2018

Park, J-H., Kim, M-K. (2016), Factors influencing the low usage of smart TV services by the terminal buyers in Korea. *Telematics and Informatics*, 33(4), 1130-1140. http://dx.doi.org/10.1016/j.tele.2016.01.001

Park, J., Lee, D., Ahn, J. (2004). Risk-Focused E-Commerce Adoption Model: A Cross-Country Study. *Journal of Global Information Technology Management*, 7(2), 6-30. http://dx.doi.org/10.1080/1097198X.2004.10856370

Pazowski, P., & Czudec, W. (2014). Economic prospective and conditions of crowdfunding 1082-1083. Retrieved from http://www.toknowpress.net/ISBN/978-961-6914-09-3/papers/ML14-685.pdf

Roca, J-C., Gagne, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior*, 24, 1585–1604. https://doi.org/10.1016/j.chb.2007.06.001

Schwienbacher, A. (2017). Entrepreneurial risk-taking in crowdfunding campaigns. *Small Business Economics*, 51(4), 843–859. https://doi.org/10.1007/s11187-017-9965-4

Stutzman, F., Capra, R. and Thompson, J. (2011). Factors mediating disclosure in social network sites. *Computers in Human Behavior*, 27(1), 590-598. https://doi.org/10.1016/j.chb.2010.10.017

Swaminathan, V., Lepkowska-White, E., and Rao, B.P. (1999). Browsers or Buyers in Cyberspace? An Investigation of Factors Influencing Electronic Exchange, *Journal of Computer Mediated Communication* 5(2). https://doi.org/10.1111/j.1083-6101.1999.tb00335.x

Wang, S., Han, L., Gao, W. (2015). Mandatory and voluntary information disclosure and the effects on financial analysts: Evidence from China. *Chinese Management Studies*, 9(3), 425-440. https://doi.org/10.1108/CMS-01-2015-0012

Wang, T., Liu, X., Kang, M., Zheng, H. (2018). Exploring the Determinants of Fundraisers' Voluntary Information Disclosure on Crowdfunding Platforms: A Risk-perception Perspective, *Online Information Review*, 42(3), 324-342, https://doi.org/10.1108/OIR-11-2016-0329

Wangari, M. J. & Karugu, J. (2018). Micro contextual characteristics and implementation of online banking system in Family Bank Limited. *International Academic Journal of Human Resource and Business Administration*, 3(4), 291-314

World Bank. (2015). *Crowdfunding in Emerging Markets: Lessons from East African Startups*, The World Bank Group 1818 H Street NW Washington, DC 20433.

Rose, G., Khoo, H., and Straub, D.W. (1999). Current Technological Impediments to Business-to Consumer Electronic Commerce. *Communications of the AIS*, 1(16), 1-74.

Shin, D., Hwang, Y. (2017). Integrated acceptance and sustainability evaluation of Internet of Medical Things: A dual-level analysis. *Internet Research*, 27(5), 1227-1254, https://doi.org/10.1108/IntR-07-2016-0200

Shin, D-H., Biocca, F. (2017). Explicating user behavior toward multi-screen adoption and diffusion: User experience in the multi-screen media ecology. *Internet Research*, 27(2), 338-361, https://doi.org/10.1108/IntR-12-2015-0334

Suh, B, Han I. (2003). The Impact of Customer Trust and Perception of Security Control on the Acceptance of Electronic Commerce. *International Journal of Electronic Commerce* 7(3), 135-161 https://doi.org/10.1080/10864415.2003.11044270

Taherdoost, H. (2018). Development of an adoption model to assess user acceptance of e-service technology: E-Service Technology Acceptance Model, *Behaviour & Information Technology*. 37(2): 173-197https://doi.org/10.1080/0144929X.2018.1427793

Taherdoost, H. (2017). Understanding of E-Service Security Dimensions and its Effect on Quality and Intention to Use. *Information and Computer Security*, 25(5), 535–559. https://doi.org/10.1108/ICS-09-2016-0074

Taherdoost, H., Sahibuddin, S. (2015), A Review Paper on E-Service; Technology Concepts. *Procedia Technology*, 19: 1067–1074. https://doi.org/10.1016/j.protcy.2015.02.152

Taylor, S., Todd, P-A. (1995). Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research*, 6(2), 144-176. https://doi.org/10.1287/isre.6.2.144

Terry, H-P., Schwartz, D., Sun, T. (2015). The future of finance: the socialization of Finance, Equity Research, Goldman Sach & Co, 62 p. file:///C:/Users/Manuela/Downloads/TheFutureofFinance_Part_3_03-13-15.pdf

Venkatesh, V., Morris, M-C., Davis, G-B., Davis, F-D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425-478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J.Y., Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178. https://ssrn.com/abstract=2002388

Venkatesh, V., and Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V. (1999). Creation of Favorable User Perceptions: Exploring the Role of Intrinsic Motivation. *MIS Quarterly*, 23(2), 239-260. https://doi.org/10.2307/249753

Venkatesh, V., Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273-315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 7 Number 1 (September)
http://doi.org/10.9770/jesi.2019.7.1(26)

Wu, Y-L., Tao, Y-H., Yang, P-C. (2008) The use of unified theory of acceptance and use of technology to confer the behavioral model of 3G mobile telecommunication users. *Journal of Statistics & Management Systems*, 11(5), 919–949. https://doi.org/10.1080/09720510.2008.10701351

Xu, F., Michael, K. and Chen, X. (2013). Factors affecting privacy disclosure on social network sites an integrated model. *Electronic Commerce Research*, 13(2), 151-168. https://doi.org/10.1007/s10660-013-9111-6

Xu, H., Dinev, T., Smith, H.J. and Hart, P. (2008). "Examining the formation of individual's privacy concerns: toward an integrative view", *Proceedings of the 29th International Conference on Information Systems*, pp.1-16.

Yu, C.S. (2012). Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model. *Journal of Electronic Commerce Research*, 13(2), 104-121.

Zheng, H., Hung, J-L., Qi, Z., Xu, B. (2016). The role of trust management in reward-based crowdfunding, *Online Information Review*, 40(1), 97-118, https://doi.org/10.1108/OIR-04-2015-0099

Zhou, T. (2011). Examining the critical success factors of mobile website adoption. Online Information Review, 35(4), 636-652.

Zlatolas, L.N., Tatjana, W., Hericko, M. and Holbl, M. (2015). Privacy antecedents for SNS self-disclosure: The case of Facebook. *Computers in Human Behavior*, 45(1), 158-167. https://doi.org/10.1108/14684521111161972

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RECOGNITION AND DESCRIPTION OF SYNERGY CONDITIONS IN TEAM WORK IN VIEW OF THE GROUNDED THEORY*

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Abstract. Developing an organisation of the future requires growing potential that will create the foundations for entrepreneurship, innovative activities and sustainable development. Every unit in the organisation's structure is to be a part of this but only team work gives the opportunity to engage the multi-directional potentials in the process. The enhanced cooperation enables any team to achieve exceptional results and the synergy effect. In this context, the value for the development of an organisation is the ability to recognise this phenomenon and indicate the circumstances of its occurrence. In the article, the grounded theory strategy applied in the research, is presented as a method enabling recognition and description of synergy conditions in a team. And based on the methodology, the author aims at explaining the factors deciding on the quality of team work. Given, however, the multidimensional nature of the research on synergy, the main objective of the article is to outline the developed research procedure first stage's endeavours and to discuss the qualitative findings. The employed approach allow keeping apt sequence of delivering empirical evidences proving that synergy is a function of state. The applied concept of grounded theory enabled the researcher to see the key definitions and to indicate variables that would explain the conditions influencing the effectiveness of teams functioning. The ability to present the first part of the findings is, in fact, an opportunity to fortify the voiced arguments that the creative approach, entrepreneurial activity, and social capital are vital to establish the synergy effect in team work. Furthermore, the findings clearly support the concept that synergy is a feature of a team that emerges at specific time, when the team reaches a particular level of relation quality. On top of that, the acquired findings also present that team proficiency and potential growth are, at all times, strengthened by the ability to perceive and implement the synergy effect.

Keywords: synergy; grounded theory; team work; quality of relations; entrepreneurship; development

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Additional disciplines: sociology, psychology.

1. Introduction

The development of modern organisations is a complex process that requires the application of principles of system thinking and undertaking multidimensional activities. Every element of the system, contributes to building cohesion and balance, but it can also be a factor disturbing and destroying the functioning of the organisation as a whole (Sange P., 2014; Senge P., Kleiner A., Roberts C., Ross R., Roth G., Smith B., 1999). The challenge for modern organisations, especially those that show a higher level of development, is proper shaping and utilisation of social potential (Putnam R.D., 2004; Coleman J.C., 1988). Such entities are usually considered to be learning, intelligent or innovative. Therefore only organisations that have the ability to see and use human engagement and creativity will increase their capabilities. The continuously growing ability to create new quality and expected results is the strength of an organisation (Zeeman A., 2017). Thus with the ability to learn at all levels, organisations create an opportunity to be successful in the future (Senge P.M., 2010).

Pointing to people and their potential as a positive energy for strengthening development, it is necessary to emphasise not only their individual contribution. Of particular importance in this way is the sense of progress and creativity potential supported by a team (Amabile T.M., 1988; Amabile T.M., Kramer S.J., 2011; Giedraitis A., Stašys R., Skirpstaitė R. 2017). Team work and the value from building high quality social relations are also important. Thanks to the mutual reinforcement of these factors and targeted interactions, conditions can be worked out that, on the basis of teamwork, can create an opportunity for the synergy (Jasińska M., 2015). It is a phenomenon, a new feature, a specific value of a team, which facilitates development and maintains this situation at a sufficiently high level for a sufficiently long time.

2. Synergy - an enhancement of an organisation’s growth

Organisations operating in a knowledge-based economy, striving to achieve set goals, should develop their own procedures, which will determine their effectiveness. In creating new development models, it is worth taking into account the multidimensional perspective of the organisation's functioning and the system thinking that supports this area. It allows us to see mutual relations, causes and effects of interactions (Senge P.M., 2010; Zeeman A., 2017). A holistic approach to an organisation as a living system will increase its flexibility in determining and accepting changes, especially those of an innovative nature.

The value in today's organisations is the ability to create patterns of thinking, which are triggered by collective aspirations (Zeeman A., 2017). With an established consent and openness to learning together, it is easier to achieve and increase the efficiency and competitiveness. In the dynamically changing conditions, organisational improvement should take into account the development of employee interaction, not only between themselves, but also with the organisation. Building common values, strengthened by openness of attitudes towards mutual learning, will ensure better understanding and use of knowledge management (Albors-Garrigos J., Ramos-Carrasco J.C., Peiro-Signes A., 2016).

With the idea of creating a learning organisation, one mustn’t forget about its relationship with the external environment. In this respect, the organisational culture can support this system, since it creates the basis for the generation, flow and accumulation of knowledge. The organisation's culture regulates these interactions. It significantly affects the quality, openness and development of interaction. Hence, it creates conditions for acquiring and sharing human capital. In this respect, an organisation achieves a continuous potential development.

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By expansion of knowledge, culture and the external environment positively influence innovations in organisations (Chang S.C., Lee M.S., 2008; Atkočiūnienė, Girnienė, 2015).

There is, however, one more aspect significant for building sustainable development - synergy that creates, strengthens and accelerates the process of organisational improvement. It also gives the meaning to the existence of any organisation. Synergy plays a significant creative role in the development of many complex systems. It was recognised as a valuable source of evolutionary novelty. Many point to the real and measurable benefits associated with various forms of synergistic phenomena (Corning P.A., 1995). In the context of learning organisations, synergy achieved through team work is important to their development (Lawford G.R., 2003; Curşeu P.L., Meslec N., Pluut H., Lucas G.J.M., 2015). Due to the fact that it is becoming an increasingly desirable and expected phenomenon in an organisation, this value was taken into account in the elaborated organisational development model (Figure 1). Moreover, substantial part of research, which is described further in the article, focused on identification of the synergy conditions in teams.

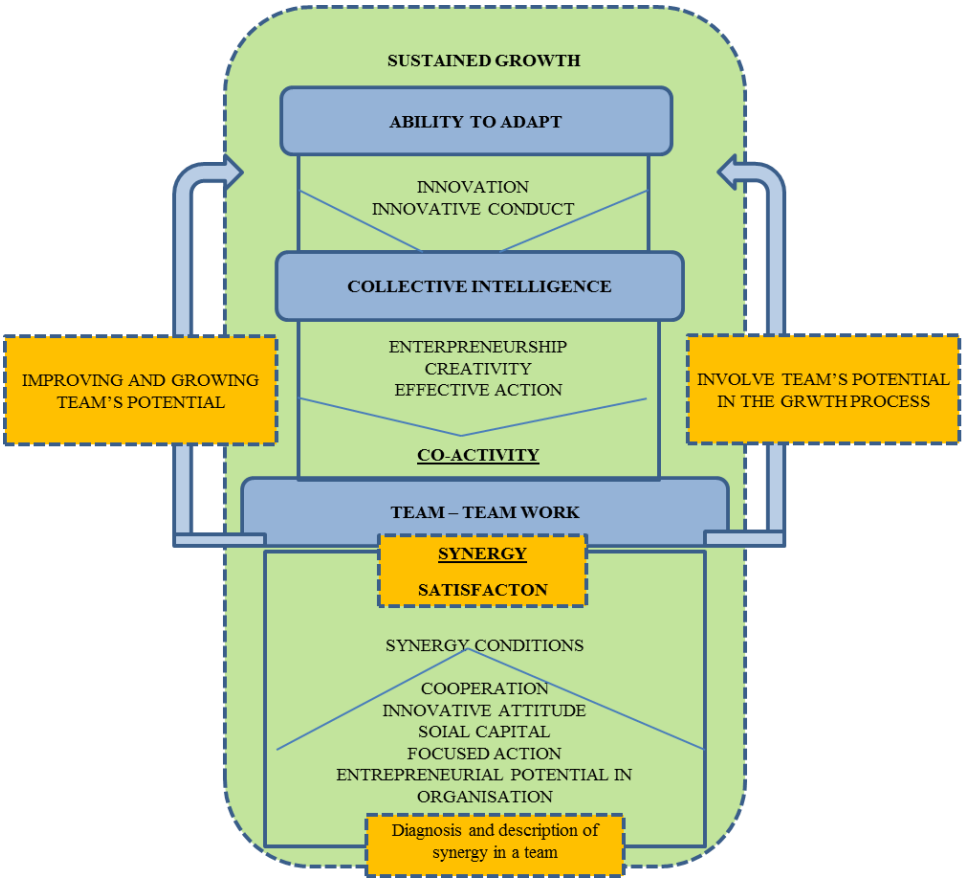

Fig.1 Conditions inducing sustainable development of organisation.
Source: own study.

In addition to creating knowledge and learning process, the development model of contemporary organisations, should take into account the direction of self-organisation and self-management in teams. This is crucial due to the benefit of balancing and maximising the potential of the organisation. And the synergy has its fair share in this aspect (Logan L.R, 1995). It creates a qualitative dimension of joint work, generates an additional, outstanding effect (Jasińska M., 2015). The emerging new ownership of a team, based on a joint vision of the future, often

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brings the desire to achieve more together. In other words, it is the members of synergistic teams that are more productive and have greater cognitive gain. (Curşeu P.L., Mescel N., Pluut H., Lucas G.J.M., 2015; Černevičiūtė, J., Strazdas R., 2018; Slávik, Š., Hagarová, R., Ljudvigová, I., Zagoršek, B. 2019). Such teams are able to generate ideas that stimulate their actions and initiate entrepreneurial activity. With the idea and the positive interaction in a team, an innovation appears (Rabey G., 2003) and this is the foundation enabling the intelligence of team work (Jasińska M., 2015).

Naturally, no synergy teams could work, if it was not for appropriate support and competence of the management team. Therefore, creating cooperation zones that will facilitate the development of individual competences is of key importance to them. So the ability to use the obtained effects is crucial from the point of view of social processes and managerial work. In this situation, awareness of progress and sense of reason turns out to be a strong reinforcement for further action (Amabile T.M., Kramer, S.J., 2011). Any development of synergistic teams needs a leadership and apt organisational culture that would enhance their actions. Executives are expected to set a good example, encourage innovation and support the process of mutual learning. In this context, managers are required to improve not only team potential, but also their own competences (Chang S.C., Lee, M.S., 2007).

The team is an example of a complex system - (micro) system. Its efficiency builds on harmony laws. Proper selection of people, cooperation as a joint social relation (bonds) as well as organisation of work, give the opportunity to organise mutual actions. This creates the directed energy of a team. The strength that is consciously reinforced, maintained and optimally used, that triggers increased activity, mutual motivation and effective actions of individuals (Rabey G., 2003). In a learning organisation, the team work satisfaction appears along with the well-used activity. The satisfaction is important for the quality of the organisation's results. It affects commitment, motivation and performance (Chang SC, Lee MS, 2007; Erdem M., İlğan A., Uçar H.I., 2014). Satisfaction from work is essential for both employees and the organisation.

3. The general project of studying the phenomenon of synergy

The research plan to recognise and describe the synergy conditions in team work composes of three essential stages, which focus on the preparation and implementation of qualitative research and activities in the field of survey and statistical analysis, carried out as part of quantitative research. The graphical sequence of actions is shown in Fig. 2.

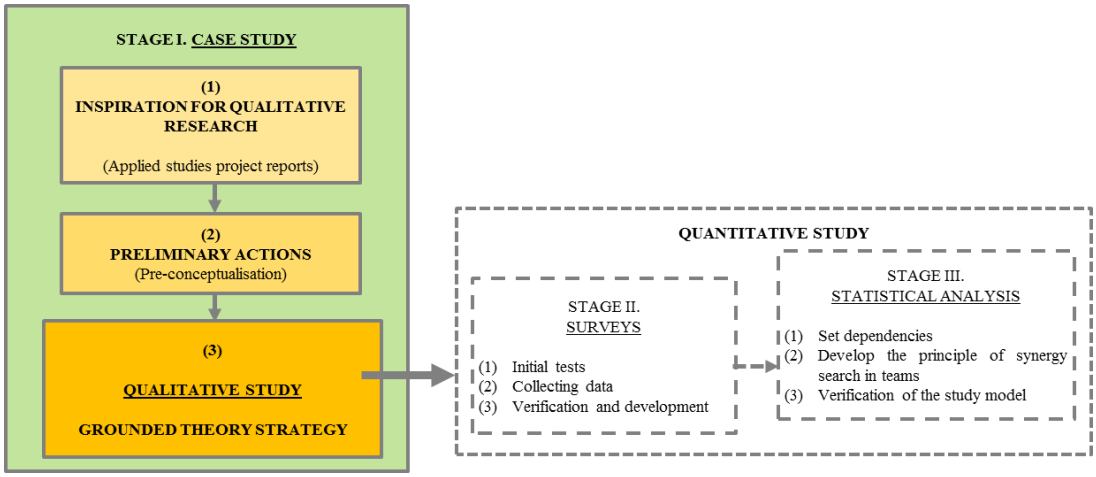

Fig. 2. The research plan to identify and describe the phenomenon of synergy in a team
Source: own study.

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The first stage, using the case study method and the implementation of qualitative research, starts in the data acquisition process. In this respect, the first stage of the study was carried out mainly on the basis of the grounded theory method (Konecki K.T., 2011; Charmaz K., 2014). At this step, I defined the scope of terminology describing synergy and gathered data on team performance. The second and third stages of the research process are related to the implementation of quantitative research. The survey studies included diverse, large groups and companies. In total, I ended up with 1394 correctly completed surveys. This material was the starting point to indicate both detailed and general assumptions of synergy in a team.

Subsequently, a statistical analysis of the research results was carried out (descriptive statistics, factor analysis, Pearson's correlation analysis). As a result I have selected variables that are important to the quality of team work, and the interactions between them. At the next step I developed the final version of the model, methods for analysing the synergy conditions in teams, presented the program (dedicated application) to search for synergy (based on PCA methods, regression) and built a model of structural equations. From then on, it was possible to indicate selected synergistic variables - i.e. forming synergistic pairs. In other words, to indicate a combination of two variables that reinforce each other, and increase the goal function. In the study, the satisfaction of team work was recognised as the objective function and the qualitative measure of synergy. The significance in the model of synergic variables is related to the fact that they determine the increase in the qualitative measure of synergy. Thus, they can be considered as a manifestation of the occurrence of this phenomenon in a team. The final stage of the research was the initial testing of the research model and the presentation of recommendations for business.

Application of the concept of grounded theory in the study of synergy

Due to the complex research process and a large amount of collected empirical data, the presentation and discussion of results was divided into stages. To emphasise the validity of the test results of each stage of the process, it was considered appropriate to present them in separate publications. The research objective of this article is to focus attention on discussing the process and results of the first stage - qualitative research. This approach allows maintaining the correct sequence of presenting empirical evidence. The applied case study method enabled to observe an interesting research aspect that focuses on the value and significance of the quality of relations in team working. Then, at the next step, based on qualitative research, I identified hidden, and still sensed by team members, states that enhance the activity of a team. Having diagnosed the environment and its conditions, I applied the grounded theory strategy. The three consecutive actions to recognise the conditions of the synergy are presented graphically in Figure 3.

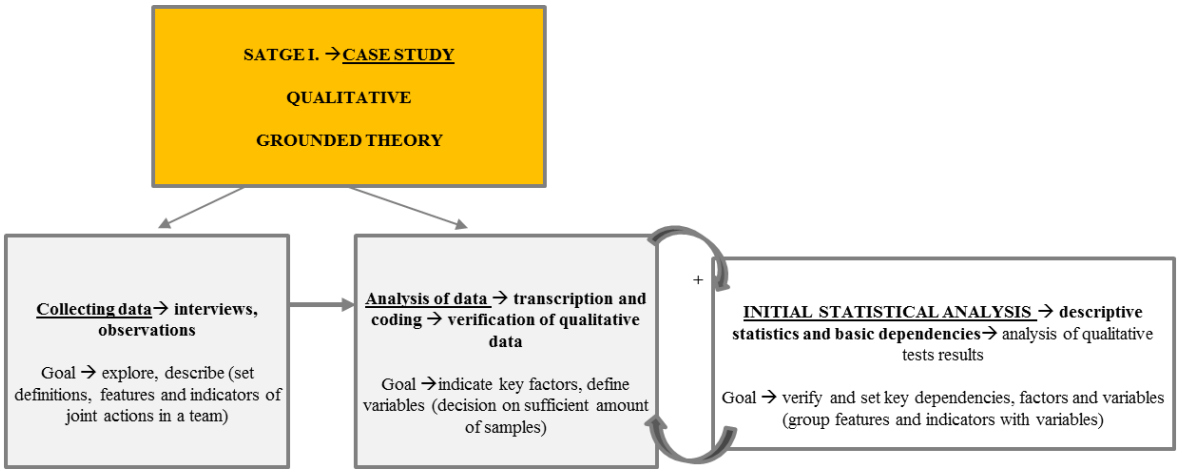

Fig. 3. Research carried out on the basis of grounded theory strategy
Source: own study.

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The preliminary stage of exploration, the inspiration for the development of the concept of qualitative research was, the analysis of interdisciplinary theoretical research. The accepted analogies, including physics, biology, pharmacology, chemistry, sociology and psychology played a special role in the search's justification and explanation. The second point of reference was the analysis of the empirical data obtained on the basis of reports of applied research projects (the *new management system developed in companies based on the results of these studies and proposed solutions*) and participant observation. To develop the reports the research process has been carried out in two big companies, which according to basic criteria are considered as developing and managed in an innovative way. The first research area - the "P-M" company takes into account the competences of personnel within the integrated management system. In the second area - the "S" company, I studies attitudes and opinions on the introduced changes and ways to build relations in an organisation. Two different research projects, implemented in two companies from different industries stressed one common and yet important aspect. It was the quality of the team work and the factors that underlie it. The author of this article was both the manager and contractor of the research. Works under applied research projects were completed about six months before the start of the qualitative research phase. This time allowed for respective conclusions, consultations with both scientific representatives and managerial personnel and subsequent development of a new concept. In addition to acquiring new knowledge about the behaviour of people in modern organisations, I primarily focused on introducing solutions in practice. This was another opportunity to collect information on the application of improvement proposals, determine the response to the change and the effects of this change. The analysed material was obtained by means of the field study method using free interviews, survey and participant observation. Moreover, the statistical analysis of test results has been performed using Pearson's r. With that information (emerging concepts, attributes of empirical material, dependencies) I formed the foundation of problem's pre-conceptualisation (conceptualisation before the study) for further research.

The next step in the research process were initial activities focused on the preparation of qualitative research and verifying companies' possibilities to join the research. This part of the process focused on the reconnaissance, scientific consultations, developing first scenarios of the study, interview and observation cards as well as patterns of code sheets. Determining the initial code key, at this stage, made it possible to prepare the correct procedure for selection and transcription of the empirical material. As a result of the decision to use the case study method and subsequent selection of an apt company for purposes of qualitative research, well-thought preliminary activities were vital. The argument in favour, of "P-M" company for the research project, was the diversity recognised in it. Research-wise, the company was very attractive thanks to the profile of its operations, the size, the area of operations, the complexity of processes and the implementation of quality management assumptions. An important premise as to the choice of the company was the changing management direction, quite a number of the changes and dynamics used to carry them out, and above all, the multiplicity of the teams within the company.

The preliminary stage was also related to the selection of the sample for qualitative research. The choice was deliberate and based on the criteria of rational selection of the subject. The research unit comprised teams which met the size and type prerequisite. Due to the properties selected for the study, prior the quota sampling, an earlier determination of the characteristics of the teams in the organisation has been performed. Having gathered relevant information on the basis of the lists prepared by the managerial personnel and HR departments, 22 teams were selected for the study. Employees and leaders from seven teams attended in-depth (a total of 59 people). Generally, this part of the study includes project teams. The rest i.e. 15 teams took part in group interviews (141 people in total). The research included also senior management but not as part of teams but as individuals managing the teams (14 people). Taking into account the size criterion, there were five teams in the group interview: i) small up to 6 people, ii) medium 7-11 people, iii) large ones over 11 people. While selecting the research teams I kept the type ratio, which gave three teams of each type: i) managerial, project (task), ii) operational, iii) trouble-shooting, and iv) advisory. The total duration of the preliminary work was 4 months.

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The case study based concept implemented in "P-M"company included two ways of research. The first concerned the qualitative study stage based on the grounded theory. The results of this study will be presented and discussed later in the article. The second step in this area is the preliminary survey. This activity was a transition to the fundamental stage of the study - quantitative research. The survey has been carried out on 22 teams and it was the starting point for the verification of the constructed set of integrated tools. The questionnaires, surveys and the preliminary assessment of the acquired material were used for discussions with the managerial personnel and for scientific consultations (*this part of the research results will be presented in another article*).

In the context of the above-mentioned proceedings, with the empirical reference I initiated the process of identifying the theory, which has been done on the basis of systematically collected and continuously analysed data (Konecki K.T., 2009), all according to the principle of the grounded theory. In this way, I used exploration and description to implement the first stage - the qualitative research using grounded theory strategy. The concepts, phenomena, and behaviours discovered and defined at that stage derive from the description of the observed and surveyed group of employees. It was one of the most important steps that made it possible to determine the scope of terminology and the conceptual meaning of the main variables. And at the second stage of the study, I also determined variable indicators and their features, which after apt verification were applied.

As a result, the first part of the grounded strategy yielded qualitative data in the form of 64 interviews. Their types and timeframes are presented in Table 1. The interviews were recorded by means of: a digital recorder (a dictaphone) and in the form of notes / flashcards, in line with the prepared question scheme. The method of recording depended on the conditions in the company and the attitude of the team. The openness of the teams to the digital recording of the study was more pronounced in the case of group interviews (focus group). Participants of individual interviews more often preferred a written record. The premise of such decisions was the need to build a greater sense of security and freedom when answering questions. Then, the empirical material was transcribed. According to the developed formula, the answers were transferred to the code sheet. Moreover, I tagged the validity and frequency of the answers, as well as any emerging doubts. Furthermore, during the interviews I managed to specify comprehensibly any areas that are difficult to investigate. As a result, main categories of variables have been selected and described. The analysis and grouping of features characterising the sources, course and effects of team work enhanced the research even more.

Table 1. Types and time of interviews in qualitative research - the context of grounded theory

Interview	Number of participants	Timeframe
1. Individual in-depth interview with members of the team (IDI - *individual in-depth interview*)	45 people	60-75 minutes
2. Individual interview with team management and team leaders (IDI - *individual in-depth interview*)	28 people (including 14 people in teams)	60 - 90 minutes
3. Different types of teams (FGI - *Focus group interview*)	15 teams (141 people in all)	80 - 120 minutes

Source: own study.

In-depth individual interviews were conducted with team members as well as managerial personnel and team leaders. The collected data allowed to indicate the behaviours and determinants of these behaviours. This proved to be important from the point of assessment of the quality of the team's operation and team work. In turn,

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interviews with the managerial personnel and team leaders were the basis for obtaining objective verification of the effectiveness of team work. Subsequently, I performed a description of the characteristics of the team, which turns out to be significant to organisation of work and functioning of a team. In addition, I pointed to the context of the organisational conditions which are crucial for effective performance of team efforts. A total of 103.5 hours was devoted to interviews, with an active participation of 214 people. Individual stages of qualitative research, such as: scenario development, data collection, transcription, exploration, were conducted over a period of nine months (*taking into account the break due to changes in the company*). The duration of this stage included not only the acquisition of data, but also the entire sequence of mutually complementing activities. In accordance with the principle of grounded theory (Konecki K.T., 2011), theoretical sampling was a complex and controlled process carried out in order to generate theory. These activities were carried out according to a specific pattern: [test preparation (1) - data collection (1) - verification and coding (1) - material analysis (1) - description of results (1) and decision on further actions] → [test preparation (n) - data collection (n) - verification and coding (n) - material analysis (n) - description of results (n) and decision on further actions]. The theory that emerged in the process, was the decisive factor as to direction, procedure, number of samples and groups to be compared. The constantly appearing similar examples constituted a theoretical saturation and effected in stopping the sampling process (Charmaz K., 2014). On this basis, I commenced formulating categories and describing their features. That procedure, also reinforced the empirical conviction that the derived theory should be considered as a derivative of empirical data analysis.

Interviews were carried out in a specific order, as indicated in Table 1. It was a sequence of coherent research, which enabled to surface, one by one, definitions and concepts that explained the conditions governing team's efficient operations. The first sequence was the individual interviews with team members. After collecting and developing the material, it was analysed and this was the staring point and a direction to proceed with respect to the issues raised during individual interviews with the managerial personnel and team leaders. At this stage, I observed new threads that described the effects of the teams' functioning, so again the data underwent thorough development and verification. With the two types of interviews, the research portrayed a more accurate picture of the potentially conducive to synergy conditions in a team. The summary of the results of the survey, which was carried out on the basis of individual interviews, was a turning point in qualitative research.

The defined basic concepts, new definitions, presented key conditions and defined specific effects of the quality of team work were the foundation of the third type of interview - focus group. Moderated group interviews aimed at verifying the material obtained so far, focusing on the efficiency of team working. The intention was also to start a discussion on the essence and value of synergy in teams and modern organisations. Before the third type of interviews, but after scientific consultations, I established the scope and developed scenario of the research. The course of group interviews was often dynamic but also inspiring in the context of emerging new issues. They most often pointed to the role and importance of a team as an intelligent collective as well as to the inventiveness in a team working.

The participant observation complemented the conducted focus interviews. It registered general behaviours and team reactions, especially during discussions. It seemed important to describe the forces that increase the effectiveness of joint actions. Thus empirically I saw that a team is able to produce better quality, higher value solutions than the sum of the individual actions. Not only the scope of the problem of the study and its result referred to the conditions under which the phenomenon of synergy may occur, the very course of the study, especially in the context of five teams, provided important explanations of how works a high efficiency team. It was observed what could happen between team members (*in terms of emotional, cognitive and behavioural aspects*) at the moment when the team begins to perceive and understand the value of the effects achieved in the team work. It was valuable to see the mutual influence of the team members. Amazingly, I also captured the awareness building process of a team, which members encourage each other when generating solutions. I also

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noticed how a group of cooperating individuals can use this emerging higher quality of relations in pursuit of common goals and development.

The characteristics features of teams and their members are crucial for any interpretation and understanding of further research hence I decided to include that data here. Analysis of this material will allow you to pay attention to potential dependencies and attempt to identify and explain the basis for creating the quality of team work. Table 2 presents the main features of teams and their participants obtained during interviews.

Table 2. Features of teams and members based on the qualitative research

Interview	Size	Type	Gender		Age				
			F	M	>30	30-39	40-49	50-59	≤ 60
Individual	Big	Project	7	5	-	4	6	2	-
	Smal	Project	3	3	-	2	3	-	1
	Big	Project	8	4	-	6	5	1	-
	Small	Project	6	-	-	-	5	1	-
	Medium	Project	2	5	-	1	5	1	-
	Medium	Project	5	3	-	4	3	1	-
	Medium	Project	4	4	1	4	2	1	-
Focus group	Medium	Project	7	2	2	4	3	-	-
	Big	Project	9	6	2	5	5	3	-
	Small	Managerial	3	3	-	3	2	1	-
	Big	Operational	11	6	-	9	5	3	-
	Medium	Operational	3	5	-	5	-	2	1
	Big	Advisory	6	8	1	2	7	3	1
	Small	Trouble-shooting	3	2	-	-	3	2	-
	Small	Operational	2	3	-	2	2	-	1
	Big	Managerial	10	8	-	9	3	4	2
	Small	Project	2	3	-	2	3	-	-
	Medium	Trouble-shooting	3	4	-	3	4	-	-
	Medium	Managerial	4	3	-	3	4	-	-
	Big	Trouble-shooting	7	5	2	6	4	-	-
	Small	Advisory	3	3	-	3	3	-	-
	Medium	Advisory	4	3	-	3	2	2	-

Source: own study.

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The presented team features, defining size and type, were the result of deliberate selection. The features identifying team members, however, allow to notice differences in terms of gender and age. Men were more likely to participate in the study (56%) than women (44%). Considering the age of the respondents, they were usually in the middle age range 30-49 (about 80%). The smallest age groups of respondents participating in the interviews was the youngest group, i.e. below 30 years-old (4%) and the oldest, i.e. over 60 years-old (3%). The features of the teams and their members taken into consideration above, as research results show, are important for building the quality of relationships and their activity. Moreover, data obtained in accordance with the principle of the grounded theory, also indicate other features important from the point of view of the conditions of synergy. They will be discussed in the context of the research results presented below.

Presentation and discussion of research results - preliminary research stage

Discussion of the research results in this part will be consistent with the first stage of the project presented in Figure 2. The focus will be on the presentation of empirical evidence in relation to the first and second step of qualitative research. The analysis will take into account the reports developed as part of the applied research carried out and interviews and observations carried out in accordance with the principle of grounded theory.

The starting point for the presentation of the main results of the research is to refer to the sources of inspiration of the developed concept of studying synergy conditions in teams for that reason, I applied our research projects in two large enterprises. The "PM" and "S" companies differ in terms of organisation and management type. The obtained results designed new or crucial upgrades to the existing management systems and the developed conclusions created the basis for the perception of a new value and a targeted use of the potential of the organisation, taking into account, in particular, the human factor in the team work. The information of the study can be considered as an element of an emerging concept that has been established in the field (organisation).

The first reference point for the developed study concept are reports of tests carried out in the "P-M" company, prepared on the basis of 484 questionnaires. They concerned the verification of personnel competences in the scope of functioning of the integrated management system. At present, companies consider competences as significant capital, which are valued intangible assets. In this sense, competences are a set of conscious, put-in-practice attitudes, knowledge and skills that are significant for both operational and strategic activities that support the development of modern organisations. They create the potential of the organisation, which stands for the company's competing ability by means of quality of products and services offered. A competence is a proof of effective performance. This is the ability to use the knowledge and skills to achieve the company's objectives. It is also important to express positive attitudes, especially in relation to the development of entrepreneurial activity, commitment, satisfaction, creativity or adaptation.

Three dimensions of competences were taken into account in the study and assessment: knowledge (W) - skills (U) - attitudes (P), in relation to employees and managerial personnel. Fig. 4 presents the main elements of competence in the aspect of obtained values and established dependencies occurring between them. The average assessment of individual elements was based on aggregated indicators, which were measured using a five-point Likert scale, where 1 is the lowest and 5 the highest value.

Knowledge is an indispensable element of building awareness of action. Its scope and level is the basis for the efficiency of the tasks, setting and achieving new goals and making good decisions. Understanding the need to improve knowledge is a significant element in shaping the attitudes of staff, which in turn enhances efficiency. Knowledge has been defined by 25 features indicating its proficiency level, ability to apply in practice, and specifying the sources of its acquisition. In the research I have also assessed the influence of knowledge on other areas and entities performing joint actions.

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Skills have been treated as a necessary factor to ensure apt quality of the tasks. The use of skills in the assigned work requires appropriate knowledge. If it is submitted for productive use while reinforcing skills, it will contribute to the effectiveness of the actions taken. Skills can be considered as employees' abilities that allow you to perform well-defined activities and create new solutions. The element (skills) has been described by means of 10 features that identify proficiency level, the ability to use in practice, the improvement of processes and undertaken actions. On top of that I studied and assessed skills in the context of their development and improvement.

The third component of competence - attitudes has been described by means of 12 features. Attitudes are expressed in behaviours, in the manner of undertaken actions and in the expressed relation to the entire organisation. Any organisation must develop and implement specific mechanisms, i.e. creating an appropriate working environment, proper influence on personnel conduct, and building a pro-active organisational culture when shaping attitudes. Positive attitudes are important for achieving tangible results and raising the quality level of the tasks performed. This is especially evident if I consider the commitment or staff satisfaction. Active attitudes are a reinforcement for developing and applying knowledge and improving skills. The analysis included the attitude towards assigned duties and expectation regarding support provided to perform the work. In terms of the performance I have also decided to assess the involvement and satisfaction from work, plus I paid attention to the ability to see the benefits of team work, the need for improvement and the possibility of increasing our efficiency.

On the basis of statistical analysis, I defined the relationship between competency components (K-S-A), I used Pearson's R with the significance level of these dependencies expressed as $p < 0.001$. And the reliability of questionnaire (78 questions) has been measured by the Cronbach Alpha coefficient (**α**). The internal coherence of the tool was considered high → $\alpha = 0.865$.

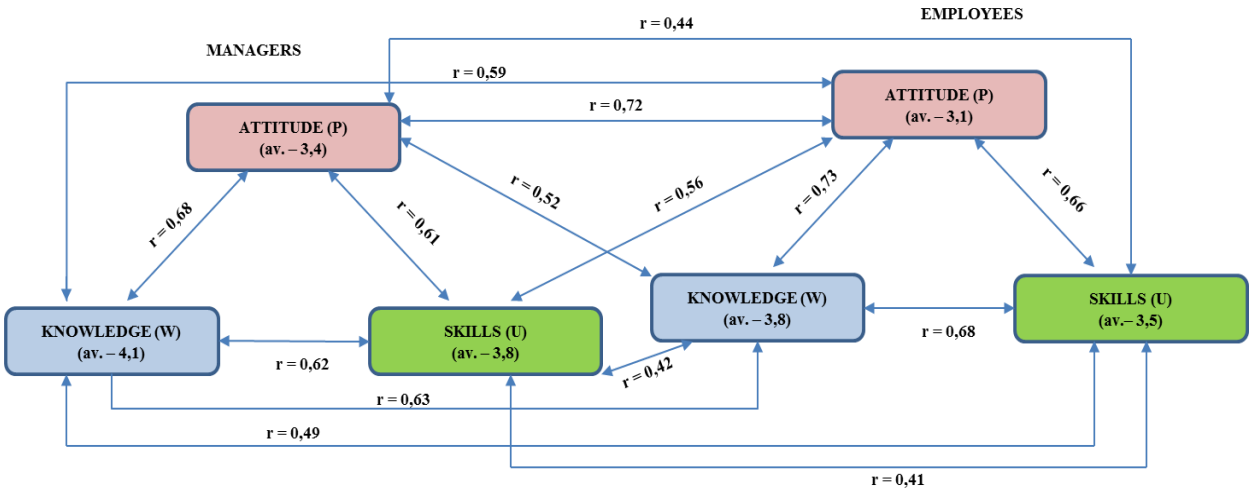

Fig. 4. Evaluation and dependence of attitudes towards changes and opinions towards relationships in the company
Source: own study.

The results of the survey indicate that in three dimensions (K-S-A) the level of staff competences is higher for managers (average score 3.8) than for employees (average score 3.5). There is some similarity in the assessments that occur between the two groups. The obtained results are distributed in a similar way, but the average values of these assessments are lower by 0.3 points at employees. The element of knowledge is the highest in both groups.

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In this respect, management obtains a higher rating (4.1) compared to employees (3.8). Skills come second, in terms of the ratings obtained. In the case of the managerial staff (3.8), this level is higher than for employees (3.5). However, the poorest link in the competences of both groups are attitudes. Their level can generally be estimated as only sufficient. In the managerial staff, attitudes rated (3.4) are slightly higher than in employees (3.1), which may result from a higher level of knowledge and awareness of responsibility for actions in the organisation.

As shown by the dependencies presented (Figure 4), the strongest relations occur in the internal set of competence elements (K-S-A) of individual groups of respondents. In both cases, these are positive and high correlations. The relationship between variables in the K-S-A system is significant, which may indicate a strong mutual influence of these factors in team work. A special role in this system is played by attitudes that despite the relatively low average grades show the strongest relations, especially in relation to knowledge (r = 0.73, r = 0.68, r = 0.59) and the attitudes of others (r = 0 72). This may mean that knowledge increases the individual's awareness, which in turn shapes attitudes. On this basis, one can speak about the operation of two strong groups of factors that enable a change in attitudes. It is about the scope and quality of knowledge that builds awareness of action, mutual learning, imitation of attitudes and cognitive openness.

A high correlation also occurs between the knowledge of the managerial staff and employees' knowledge (r = 0.63). This significant dependence indicates the important role of knowledge in the process of organisational and collective learning. Efficient communication and high quality of relations would enhance the process. This only supports the idea that the flow of knowledge in an organisation requires cooperation and the creation of an appropriate networking to create a new quality and innovative knowledge.

Knowledge and skills presented also significant dependence. A higher correlation in this system takes place in the case of employees (r = 0.68) than in the management (r = 0.62). Well-used skills require the knowledge. Knowledge supports efficiency, directs actions, facilitates the performance of duties. Awareness of their potential creates a basis for understanding phenomena and processes taking place in the organisation and its environment. This circumstance increases the possibility of fuller use, but also improvement of skills during joint work. Attitudes also strengthen possessed skills and that indicate a significant dependence, both in employees (r = 0.66) and in management (r = 0.61). This element of competence is important from the point of view of activity and involvement in action. Properly shaped attitudes, allow you to achieve more, faster and better while team working.

The second inspiration for the developed concept of the study is a report on the research carried out in the "S" company, based on 290 employee surveys. The aim of the project was to study attitudes and opinions on the introduced changes and the way of building relations in the company. The changes in contemporary organisations have a more dynamic character, their number increases, but the time needed to implement them is shortened. Increasingly, they require the use of comprehensive solutions and undertaking entrepreneurial activities. The change process should focus not only on building efficiency, but first and foremost on the development of the organisation. It requires conscious and active cooperation. Teamwork, knowledge, attitudes and social relations play an important role in making changes. The value of human and social capital in the change process, is of strategic importance and a foundation of future organisation.

The research referred to five main areas describing the employees' attitude to the implemented changes and the assessment of relations created in that situation. Figure 5 shows assessments and dependencies. The first dimension of the study was the opinion of the staff on their participation in the process of changes and the development of the company. The second aspect took into account the awareness of the benefits and threats resulting from the introduced changes. The third part of the study included the opinions and assessment of the staff on communication between colleagues. The fourth scope of the study was to get an opinion on the relations

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between employees and the company. The fifth empirical dimension concerned the staff opinion on behaviour towards work.

Each of the presented five dimensions has been treated as an aggregated indicator, described by 12 to 15 features. The variables were measured by using a five-point Likert scale, where 1 was the lowest and 5 the highest value. In addition, a statistical analysis was carried out between the variables based on Pearson's r ratio. The study used relations at the significance level of $p < 0.001$. The reliability of the questionnaire was also evaluated (73 questions in total) using the Cronbach alpha ratio (**α**). The results show a very high internal cohesion of the tool at the level of $\alpha = 0.898$.

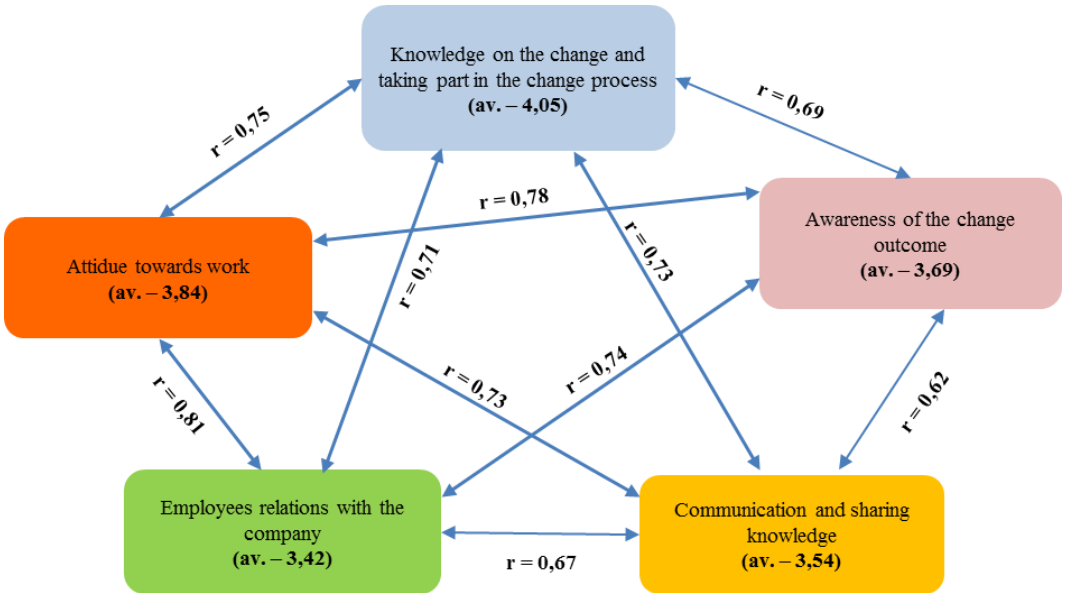

Fig. 5. Evaluation and dependence of attitudes towards changes and opinions towards relations in the company
Source: own study.

On the basis of the analysis of the survey results, it can be generally stated that the value of the average employees' assessment of changes, their course and the relations in the company created in those circumstances indicates quite well result of (3.71). The highest ratings (4.05) within the five verified areas, has the knowledge about changes and employee participation in the process. This may indicate the appropriate awareness of personnel in which direction the changes go and the willingness to actively participate at the stage of their planning and implementation. The personnel's behaviour towards work is quite well (3.84). It can be assumed, in this case, that there are well-established behaviours, although this may not always result from the actions of the managerial staff (e.g. commitment, satisfaction). It should also be assumed that support is needed to maintain and develop behavioural activities, especially those that are important for the quality of team work (including trust, kindness, mutual assistance). The study presented that the awareness of the effects of changes (3.69), communication and knowledge sharing (3.54) and employee relations with the company (3.42) are below the average. On this basis, it can be preliminarily assumed that social capital should be developed especially in the change process, the attitudes of openness to team work should be strengthened and the knowledge management mechanism in the organisation should be improved.

The statistical elaboration of the research results enabled the identification of significant relations (Figure 5) between the five discussed dimensions. One very large relation was observed in the variable system ($r = 0.81$). It points out that the relations between employees and the company are strongly related to behaviour towards work.

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On this basis, it can be assumed that properly shaped and strengthened behaviour towards work will translate into the quality of the employee's relations with the company.

An element of behaviour that strengthens the relations between employees and the company is generally a good assessment of employees own competences. It is created on the basis of a high level of awareness of the professional role, high level of competence in relation to tasks and experience at work. This approach is related to the quite high level of education and seniority in the company. The element that is weaker in the assessment is support for the development of competences and the average assessment of competencies of employees. This

result has its grounds in the quality of relationships with colleagues and management, which require significant enhancement. The result may be a lack of openness and trust in the team work. This will slow down the entrepreneurship and effectiveness of personnel in achieving goals.

In general, it means that there is a good overall level of knowledge of employees in relation to the work performed and a fairly well-developed range of professional skills. However, what raises doubts is the average degree of using knowledge and skills in the undertaken work. In this case, one can point again to the argument of the average quality of relationships and the use of limited forms of activity in the tasks performed. This maintains the view that employees do not use their potential fully. Probably this is due to inadequately arranged cooperation and low level of challenges at work. These are important arguments, mainly in the aspect of building a sense of meaning and value in teamwork.

Considering involvement and identification as a sign of building relations with the company, a quite good level of behaviour in work organisation and a good assessment of the effects of cooperation plays an important role. The weakness observed at behaviour analysis is the low level of quality of relations, especially between departments in the company. This has its effect in poor coordination of joint activities and inefficient communication. The cooperation in teams or organisational units is quite good, but it is weak in the relations between teams / organisational units. Such situation, resulting form deficits of behaviour, causes significant threats in communication, and in the flow of information and sharing knowledge ($r = 0.73$). It also limits the awareness of the achieved effects in the organisation and creates conditions for the occurrence of negative attitudes. This situation disturbs the implementation of processes, creates a low level of social capital and, as a result, slows down the development of the organisation.

The weakest link of behaviour towards work is the attitude of personnel. They were defined by such indicators as: commitment to work, job satisfaction, trust towards colleagues, focus on cooperation and care for the quality of cooperation, kindness, help in team work. The behaviour towards work, allows to point to high correlations with the awareness of changes effects (benefits and threats) and joint work ($r = 0.78$). It can be assumed that if employees' awareness on the consequences of changes for the organisation and for themselves, is increased, they will be more likely to show more positive attitudes. It concerns both the proactive approach, including the attitude towards entrepreneurship, creativity, innovation and cognitive and social openness.

A high correlation ($r = 0.75$) also occurs between knowledge about changes and participation of employees in the change process and behaviour towards work. The rationale for this dependence is the significant impact of employee involvement in planning and implementation of changes and information on the benefits of changes to attitudes, knowledge and skills. This is in line with the theory that the success of changes depends on the appropriate preparation of people for this process and enabling them to create the change. This approach generates operational efficiency, appropriate use of potential and creates added value. In addition, positive and active attitudes reduce or eliminate resistance to change and change load.

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Another high correlation (r = 0.74), perceived in the study, is the relation between the employees' relations with the company and the awareness of the effects of changes. This situation suggests that if employees have knowledge of real or potential benefits and risks, they will be more open to what is happening in the organisation. Thus employees identify more with the company and get involved in its operations. This applies mainly to entrepreneurial activity and suggesting new directions of development in the organisation. Building and maintaining an appropriate level of trust and quality of relations in the team work can only strengthen the dependence.

It can be assumed that, the variable partially mediating between building a relation with the company and the awareness of the effects is an adequate level of knowledge about changes and the attitude of employees towards change. The confirmation of this is the significant dependence (r = 0.71) on the relation between employees and the company - knowledge about changes and participation in the change process e.g. providing good flow of information and the right sources, and making employees aware of what is going on in the organisation will make them more involved in the company's affairs and open to joint activities. In addition, the possibility of participation will create a good ground for shaping trust and bearing responsibility for the quality of the relationship. In this respect, it is worth noting the next significant dependence i.e. knowledge about changes and the awareness of their effects (r = 0.69). It means that participation and sharing knowledge develops the ability of employees to perceive and understand the benefits and threats resulting from the process of change in the organisation.

In view of knowledge management as the most important management system in learning organisations I go to the next high correlations. The study included two dimensions of the system, which is the communication subsystem and knowledge sharing. In this respect, reference should be made to two significant relations. First dependence (r = 0.73) related to employees' knowledge of changes and their involvement in the change process. An appropriate communication system, defined by good flow and sources of information, effective communication between the managerial staff and employees, is the basis for creating knowledge resources in the organisation. It also enables the efficiency of knowledge generation, localisation and transfer processes. The high quality of relations (r = 0.67) is a reinforcement of this dependence system, which justifies the importance of participation in building engagement, openness to cooperation and identification with the company. In this context, attention is also drawn to positive attitudes, especially towards team work. Empirical evidence (r = 0.73) justifying this view is the significant relation between communication and knowledge sharing with behaviour towards work, which is indicated by attitudes (kindness, mutual help, content). In addition, adequate cognitive openness, trust and commitment to collaborative work not only increase the ability to share knowledge, but most of all they create it. As a result, a new value of knowledge in the organisation is created that increases the scope, quantity and quality, which are important in the context of shaping innovative and creative behaviours.

Presentation and discussion of research results in the view of grounded theory

The first part of the analysis of research results presented above gave rise to some key findings. The main one, indicates a certain feature that occurs in the state of high activity of team work. It was estimated that there is some strength in the actions of people that can generate an outstanding effect. This is particularly evident when people start cooperating with each other in an appropriate manner. It has become an inspiration for consolidating the need for new exploration of and for defining and describing the phenomenon. Another finding draws attention to the significant role of the quality of relations in achieving the efficiency of work. It was also noticed that team work increases the openness to sharing employees' potential and the appropriate use of their knowledge and skills. It was established that the cooperation, reinforced by the awareness of human resources, is an indispensable element for the process of mutual learning and development in the organisation.

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In enhancing team work, the attitudes and behaviours share a paramount importance. It was recognised that appropriate shaping of positive and active attitudes is increasingly becoming a challenge for the managerial personnel in contemporary organisations. In this respect, the managerial personnel must have a sufficient level of numerous competences, including social and personal. The next finding singled out that attitudes are the implication of the quality of the relation, the increase in efficiency of cooperation and the ability to strive for achieving distinctive effects. In the context of shaping attitudes, especially personnel's, it was noticed that it is important to undertake activities that enable them to increase and maintain a high level of job satisfaction and commitment. The opportunity to improve competences and offer an appropriate reinforcement system in this aspect may support this activity.

A great force shaping behaviours, that was discovered in the study, is participation, increasing freedom and awareness in the work of personnel and a sufficiently high level of trust in cooperation. The above findings turn out to be extremely important during changes and setting new directions of development. The study also revealed the value and need to use entrepreneurial activity, creativity and the possibility to realise the potential in team work. Based on the analysis, it was recognised that the process of organisational learning, based on an efficient system of communicating and sharing knowledge, should be strengthened by the development of social potential in the organisation. Therefore, appropriate shaping of positive attitudes should be considered a valuable investment in social capital.

With such well-established knowledge, further activities related to the development of the concept of a new study were carried out. The main purpose of the undertaken work was to recognise and describe the conditions of the occurrence of the phenomenon, which could be the most indicative of synergy. It was considered that the best way to deal with an unspecified phenomenon would be to apply a grounded theory. The assumption was that the definition and verification of this should be carried out under specific conditions. To this end, a scenario was developed that included a team-oriented study. It was considered that the phenomena that arouse great empirical curiosity will be more clearly observed in a situation when employees consciously interact with one another, observe each other's behaviours and act. The research profile determined in this way assumed the selection of different types of teams. The research unit established the members functioning in specific teams. I assumed the possibility to examine the image of a team that can be considered as a picture of relations, behaviours and effects of team work. Having said that, it means that determining and analysing elements of this image allow us to observe and describe the default feature - confirm the synergy.

In accordance with the accepted strategy of the grounded theory, the first step was to conduct individual interviews with members of selected teams. Initially, the research was simple empirical curiosity, which concerned several main slogans: the quality of relations, team work, the effects of team work, team activity, the activities of the managerial staff, the course of cooperation. The interviewing scenario took into account the possibility of describing the relationship and the way of team's operating. I make sure that respondents could utter their opinions freely but I ensured that out subject to research is completely addressed. At this stage of the study, the word synergy was not used on the part of the interviewer, leaving room for the term to emerge in a natural way.

Based on the established methodology, the collected material was transcribed. Next, the material was verified and further interviews were completed with issues requiring more elucidation or explanation of ambiguity. The first part of the results of qualitative research, obtained on the basis of grounded theory, became a source of basic terms, indicators and features describing the functioning of teams.

The focus group was an extension of individual interviews. It was aimed at verifying and extending the information from previous studies. At this stage of the research, team members were more open to discussion, mutually inspired while responding and looking for justifications.

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I considered it a sufficient amount of knowledge after conducting interviews with members of 22 teams (a total of 200 employees and leaders) including the management of the company (14 people). I have noticed similarities in answers in both forms of the interviews along with the fact that no new information has been brought as a result of further interviews. While elaborating the material, I determined, the most characteristic indicators and features of the team's activities indicated by the respondents. The basic material is presented in Table 3.

Table 3. Basics of recognising the conditions of synergy in a team based on the principles of grounded theory.

Question	The most characteristic indicators and features
What is the basis for building and maintaining the quality of relationships?	**Creating and developing contacts with colleagues:** frequency of relations, number of relationships, relations dynamics, contacts activity, forms of contacts, degree of dependence, type of interaction, organisation of relationships, closeness of relations, emotions in relationships, informal relations. **Regulating relationships**: relationships, common values, mutual respect and help, interest in others, adherence to common rules, joint arrangements, common time at work, responding to difficulties, speaking and explaining. **Communication**: forms of communication, transfer of knowledge and information, current information, timely information, exchange of views, making discussions, language of communication, openness to others. **Confidence**: kindness of colleagues, honesty, sense of justice, sense of security, believe in the effectiveness of action, trust in competence, believe in opportunities.
What is important in team work?	**Team's potential**: commitment to team work, tenacity in pursuing goals, focus on organisation and task, responsible conduct, openness to initiative, openness to change. **Work organisation**: awareness of the course of action, setting common goal, foster work and relation, freedom of action, work overload and time pressure, time for team work, awareness of dependence. **Competences:** knowledge and skills (appropriate resources, sharing knowledge, developing knowledge, improving skills), attitudes (commitment, giving something from each other, role awareness, content, identification).
What is the effect of joint actions?	**Activity in a team work**: sharing knowledge, learning in a team, searching for solutions together, innovation, openness to development, willingness to take risks, perceiving new opportunities, innovative behaviours. **Effectiveness**: awareness of the effects of work, quality of work, efficiency, effort at work, elimination of errors in work, effectiveness of team work. **Self-development**: openness to development, curiosity in action, development and sharing of abilities, innovative imagination, non-standard thinking.
What is the activity in team work?	**Personal activity**: motivation to work, innovative attitude, pursuing goals, sharing personal resources at work. **Team activity**: creativity, entrepreneurial action, joint solutions, sensitivity to the innovations of others, introducing changes, expanding contacts, improving activities, exchanging experiences.
What management activities are important for building teamwork?	**Motivating**: support action, reward extraordinary behaviours, expres appreciation, recognise the initiative, challenges at work. **Working atmosphere**: information flow, feedback, accessibility, information on effects, promoting activity, supporting innovative behaviours, encouraging team work.

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What to look for in the course of cooperation?	**Behaviour at work**: mutual inspiration, mutual motivation, focus on team work, sense of community, support of superiors, ability to assemble resources at work. **Difficulties**: the ability to control difficult situations, focus on the problem not on the person, independence to overcome difficulties, ability to solve problems.

Source: own study.

In the study, when watching the behaviours, reactions and mutual interaction of respondents I gathered additional information. By the end of every group interview I used the word 'synergy' which evoked multiple reactions from smile, vivid discussion to a prolonged consideration. The respondents, however were inspired by the subject and generally were quite prompt to present their arguments, associations and definitions.

Table 4. The result of synergy exploration and diagnosis in view of grounded theory

A new indicator selected in the survey	**Satisfaction**: energy to work, sense of common work, value of work, pride of achievement, sense of development in a team, sense of new opportunities, real impact on cooperation, the effect of accelerating work, an impression of better quality work.
What is the synergy associated with?	**Synergy**: pleasure of being in a team, additional contribution to team work, high level of active work, highly focused, profit, more efficiency, aiming higher, effect of temporary action, team bonus, extras, doing something more or different, cooperation satisfaction, relation maturity, mutual learning and development, savings, higher quality, sense of accomplishment and successful team work, sense of common work, pride of shared achievements, good work, cohesion, internal peace, sense of community, wisdom of knowledge, willingness to continue cooperation, higher efficiency of operations.

Source: own study.

With the application of grounded theory to diagnose conditions triggering synergy in teams, I have grouped gathered features in order to analyse them further. Given the division of research areas as presented in tables 3 and 4, I defined seven key dimensions: cooperation, the effect of team work, effort in team work, quality of relations, management (work of managerial personnel), team potential and the indicator discovered in course of the study - satisfaction .In the next activity I used the rho-Spearman correlation coefficient to statistically develop qualitative data in the next activity. In this case, for the calculated value of the 't' test, the significance is $p < 0.001$. The dependence of results is presented in Fig. 6.

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COOPERATION	-						
TEAM WORK EFFECT	r_S =0,84	-					
EFFORT IN TEAM WORKING	r_S = 0,47	r_S =0,55	-				
QUALITY OF RELATIONS	r_S =0,75	r_S =0,66	r_S =0,59	-			
SATISFACTION	r_S =0,73	r_S =0,79	r_S =0,56	r_S =0,82	-		
MANAGEMENT	r_S =0,64	r_S =0,65	r_S =0,51	r_S =0,63	r_S =0,65	-	
TEAM POTENTIAL	r_S =0,58	r_S =0,72	r_S =0,46	r_S =0,62	r_S =0,61	r_S =0,45	-
	COOPERATION	TEAM WORK EFFECT	EFFORT IN TEAM WORKING	QUALITY OF RELATIONS	SATISFACTION	MANAGEMENT	TEAM POTENTIAL

Fig. 6. The result of the rho-Spearman correlation coefficient of the main variables of the quality of team work
Source: own study.

Taking into account the overall correlation result, it can be stated that volume of dependencies appearing in the presented system is somewhat substantial. This only supports the mutual influence of the examined variables as significant in the indication of synergy in teams. Figure 6, clearly points out two very high correlations. The first shows a very large dependence (r_S= 0.84) between cooperation and the effect of team work. It means that the quality of cooperation translates into measurable effects of the team. The behaviour at work, which increases the activity and effectiveness of team work, is particularly important. Another very high correlation (r_S= 0.82) is the relation between satisfaction and the quality of the relation. Here, the quality of relations in team work defined by the level of trust and the quality of contacts between colleagues creates conditions in which team members can experience the pleasure of working together. In addition, efficient communication, knowledge sharing and relation building creates a sense of development, new opportunities and increases the real impact on cooperation.

A high correlation (r_S= 0.79) that occurs between satisfaction and the effects of team work is another argument defining favourable conditions for synergy. This relation reinforces the view that a state of pleasure in team work can be achieved if its effects meet or exceed the expectations of team members. In the context of the effects of team work, reference should also be made to significant dependence (r_S= 0.72) with the potential of a team. Commitment to team work, perseverance in pursuing goals and focus on action convert to effectiveness and quality in achieving results by the team. This dependence is legitimated by the influence of self-development of team members on their cognitive openness, entrepreneurial initiative and willingness to make changes. In view of the above, synergy seem to manifest itself as the energy created by satisfaction enhanced by the high quality of relations in team, the effects of team work and the possibility of realising and developing their own potential when working together.

Moreover, the analysis draws attention to the significant relationship (r_S= 0.75) established between the quality of relations and cooperation. In this respect, mutual inspiration, mutual reinforcement and a sense of community in developing relations and building trust are important. What should be stressed in this relationship is the importance of the quality of communication and the regulation of relations (norms, rules) in difficult situations in the team. The ability to master difficulties and the ability to solve problems require mutual trust and faith in the effectiveness of action. From the point of view of the quality of the relation, the effect of team work is significant

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in dependence (r_S = 0.66). It is the quality of contacts that conditions activity in a team work. Sharing knowledge, mutual learning, joint search for solutions will be possible if the team provide appropriate frequency, number and form of contacts. Let's not forget that the type of interaction can increase openness to development.

Cooperation and satisfaction presented high correlation (r_S= 0.73). Thus it should be assumed that properly arranged cooperation, while maintaining high quality relation, will increase the satisfaction of team members. Particularly, the support of superiors and the ability to assemble the necessary resources at work can create a sense of encouragement and a real impact on cooperation. In this approach, the autonomy in overcoming difficulties may bring the sense of awakening new opportunities and development. Another collaboration significant variable (r_S= 0.58) is the team's potential. This is where the relation between commitment to work and responsible conduct and a sense of community in a team should be indicated. The positive relation between openness to change and autonomy in overcoming difficulties also support that significant correlation.

The statistical data allowed to see the validity of management (managerial staff) in creating conditions for synergy. In this context, a fairly high correlation can be indicated in relation to building cooperation (r_S= 0.64), effects of team work (r_S= 0.65), shaping the quality of relations (r_S= 0.63) and building satisfaction in a team (r_S= 0.65). The role of the managerial staff in this area is to create and apply appropriate mechanisms to strengthen knowledge, skills and attitudes. The challenge for managers is to shape and utilise potentials, build good environment for team work, support activity and innovation in the organisation.

An interesting finding is a moderate correlation of effort in team work in relation with: cooperation (r_S= 0.47), the potential of team (r_S= 0.46), management (r_S= 0.51), satisfaction (r_S= 0.56), and the quality of the relation (r_S= 0.59). It can be assumed that there are some hidden or unacknowledged factors in this study that may have a greater impact on the team working effort. There may well be a lot of such factors that is why the analysis indicated a significant but moderate relation. In the context of the indicators, the most important for the effort are difficult situations and ability to deal with problems, organisation of and focus on work, time management and sense of common work, and let's not forget the impact of team work support and promoting, support for activity and freedom of work. However, the most important element for the effort in the team work is the quality of the relation in a team. In this respect, one should refer to the flow of knowledge, sharing experience, the type and number of contacts, as well as kindness and trust in the competences of colleagues.

The intention to implement the study based on the grounded theory strategy was the opportunity to recognise and describe preliminary conditions supporting synergy in a team. Based on the results and subsequent analysis, it should be assumed that the goal has been achieved. The study was complex and demanding, both at the stage of acquiring and developing data. Nevertheless, with great satisfaction I can point that the research consolidated satisfaction the knowledge about synergy in practice.

Conclusions

Initially, the first stage of research allowed to identify conditions of synergy and to indicate key features for the quality of team work. In course of the research I developed of an integrated set of research tools to collect and later to develop and analyse data. One of the tools was a *questionnaire to analyse joint activities in a team,* the next was *a questionnaire describing the functioning of a team and a company*. Both surveys are a complementary set of information that will allow subjective and objective evaluation of team work.

The validity of qualitative research shows that the synergy in a team may emerge from the opportunity to notice new aspects. The first stage of the research, recognised the potential and natural conditions supporting and

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creating teamwork's quality. The study identified the dependencies between the team's effectiveness and organisational premises and established the scope of understanding the concept and effects of synergy. Furthermore, in course if the research I managed to identify the essence of the relation between the synergy and the quality of relations and the shaping of social capital in the team. All that work was a foundation to build the appropriate language code, important in the development of surveys and questionnaires and subsequent sheet codes in the database during the second and third stage of the study.

The role of active teams is to create learning organisations, stimulate development and spring them to a higher level - innovation. To achieve all that a company must set the direction of innovative work and master team-working. A success in this means creative, new and unique ideas, which value come from both novelty and usability (Perry-Smith J.E., Shalley C.E., 2003). In an intensively competitive and dynamic environment, innovations become the most important factor influencing the organisation's success (Udwadia F.U., 1990).

References

Albors-Garrigos, J., Ramos-Carrasco, J.C., Peiro-Signes, A. 2016. Actional Intelligence, a Key Element for Actioning Knowledge. A Field Study Analysis. *Journal of Information & Knowledge Management* 15(1) https://doi.org/10.1142/S0219649216500064

Amabile, T.M., Kramer, S.J. 2011. The power of small wins. *Harvard Business Review* 89(5): 70-80. https://hbr.org/2011/05/the-power-of-small-wins

Amabile, T.M. 1988. A model of organizational innovation. In BM Staw, LL Cummings (Eds.) *Research in organizational behavior*. 10: 123–167.

Atkočiūnienė, Z., Girnienė, I. 2015. Impact of Knowledge Management Processes on the Creation of Innovations: Case Study. Proceedings of the 16th European Conference on Knowledge Management/Academic Conferences and Publishing International Limited. 2015, p. 321-329. http://toc.proceedings.com/27956webtoc.pdf

Černevičiūtė, J., Strazdas R. 2018. Teamwork management in Creative industries: factors influencing productivity. *Entrepreneurship and Sustainability Issues* 6(2): 503-516. http://doi.org/10.9770/jesi.2018.6.2(3)

Chang, S.C., Lee, M.S. 2008. The linkage between knowledge accumulation capability and organizational innovation. *Journal of Knowledge Management* 12 (1): 3-20. https://doi.org/10.1108/13673270810852359

Chang, S.C., Lee, M.S. 2007. A study on relationship among leadership, organizational culture, the operation of learning organization and employees' job satisfaction. *The Learning Organization* 14(2): 155-185. https://doi.org/10.1108/09696470710727014

Charmaz, K. 2014. Grounded Theory in Global Perspective: Reviews by International Researchers. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.858.8343&rep=rep1&type=pdf

Coleman, J.C. 1988. Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure. *American Journal of Sociology* 94:95-S120.
https://faculty.washington.edu/matsueda/courses/587/readings/Coleman%201988.pdf

Corning, P.A. 1995. Synergy and self-organization in the evolution of complex systems. *Systems Research*. 12(2) https://doi.org/10.1002/sres.3850120204
.
Curşeu, P.L., Meslec, N., Pluut, H., Lucas, G.J.M. 2015. Cognitive synergy in groups and group-to-individual transfer of decision-making competencies https://www.frontiersin.org/articles/10.3389/fpsyg.2015.01375/full

Erdem, M., İlğan, A., Uçar, H.I. 2014. Relationship between Learning Organization and Job Satisfaction of Primary School Teachers. *International Online Journal of Educational Sciences*. 6(1): 8-20. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.658.1690&rep=rep1&type=pdf

Giedraitis, A., Stašys, R., Skirpstaitė, R. 2017. Development possibilities of the management team within a production company. *Entrepreneurship and Sustainability Issues*, 5(2), 212-222. http://doi.org/10.9770/jesi.2017.5.2(4)

Jasińska, M. 2015. Synergy, the result of intelligent cooperation. http://www.irdo.si/skupni-cd/cdji/cd-irdo-2015/referati/15-monika-jasinska-paper.pdf

Konecki, K.T. 2011. Visual Grounded Theory: A Methodological Outline and Examples from Empirical Work, 131-160. https://www.researchgate.net/publication/233991214_Visual_Grounded_Theory_A_Methodological_Outline_and_Examples_from_Empirical_Work

Konecki, K.T. 2009. Teaching Visual Grounded Theory. *Qalitative Sociology Review* 5(3). https://www.researchgate.net/publication/233991153_Teaching_Visual_Grounded_Theory; https://hrcak.srce.hr/file/106256

Lawford, G.R. 2003. Beyond success: Achieving synergy in teamwork. *Journal for Quality and Participation* 26(3): 23-27. http://asq.org/qic/display-item/index.html?item=19781

Logan, L.R. 1995. A natural synergy. Team Performance Management. *An International Journal* 1(1): 12-17. https://doi.org/10.1108/13527599510064922

Perry-Smith, J.E., Shalley, C.E. 2003. The social side of creativity: A static and dynamic social network perspective. *Academy of Management Review* 28: 89-106. http://dx.doi.org/10.2307/30040691

Putnam, R.D. (ed.). 2004. *Democracies in Flux: The Evolution of Social Capital in Contemporary Society*. Oxford University Press, New York, 345p.

Rabey, G. 2003. The paradox of teamwork. *Industrial and Commercial Training* 35(4): 158-162. https://doi.org/10.1108/00197850310479141

Senge, P.M. 2010. *The fifth discipline: The art and practice of the learning organization*. Crown Publishing Group. New York, 168p.

Senge, P.M. 2014. *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. Crown Business, New York, 356p.

Senge, P., Kleiner, A., Roberts, Ch., Ross, R., Roth, G., Smith, B., Guman, E.C. 2007. The dance of change: The challenges to sustaining momentum in learning organizations. https://solonline.org/wp-content/uploads/2016/12/Study-Notes-for-the-Dance-of-Change.pdf

Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., Smith, B. 1999. A Fifth Discipline: The Dance of Change: The Challenges of Sustaining Momentum in Learning Organizations. Crown Business. New York, 345p.

Slávik, Š., Hagarová, R., Ljudvigová, I., Zagoršek, B. 2019. Business model and team as preconditions of a start-up viability. *Entrepreneurship and Sustainability Issues* 6(3), 1204-1227. http://doi.org/10.9770/jesi.2019.6.3(25)

Udwadia, F.U. 1990. Creativity and innovation in organizations: Two models and managerial implications. *Technological Forecasting and Social Change* 38(1): 65-80. https://doi.org/10.1016/0040-1625(90)90018-Q

Zeeman, A. 2017. Senge's Five Disciplines of Learning Organizations. https://www.toolshero.com/management/five-disciplines-learning-organizations/

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TRANSIT TARIFF OPTIMIZATION MODEL FOR RUSSIA AND CENTRAL ASIA ENERGY COOPERATION

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Abstract. The purpose of this article is to develop an optimization model for determining transit tariffs for energy resources, ensuring maximum efficiency of energy cooperation between Russia and the countries of Central Asia. The informational basis of the study was the statistical values of the indicators in the context of the countries studied for 2010-2017: gross domestic product (GDP), exports, energy imports, CO_2 emissions, the level of transit tariffs for oil and gas. In order to achieve the objectives set by the method of multidimensional factor and integral analysis, the effectiveness of export-import relations between the studied countries was evaluated. The regression analysis method determined the elasticity coefficients of the export-import potential of countries and the transit tariff, with their impact on the efficiency of energy trade. Using a non-linear method of the generalized decreasing gradient, a model has been developed for calculating the optimal levels of transit tariffs for oil and gas, at which maximum efficiency of energy cooperation in the framework of export-import operations between Russia and Central Asia is achieved. The developed model for calculating the optimization of transit tariffs for hydrocarbons is based on the mutual reduction of their level between countries and the principle of equivalence. Practical application of the obtained optimal values of transit tariffs will ensure the intensification of export-import operations with hydrocarbons between countries on mutually beneficial economic conditions. It will be the basis for the development of effective strategies for the development of dense energy cooperation in the future.

Keywords: energy cooperation; transit tariffs; energy resources; Russia; Central Asia

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JEL Classifications: Q4, H21, F1

1. Introduction

A multitude of inter-governmental bilateral or multilateral agreements signed by Russia and the former Soviet countries in Central Asia focuses on mutual economic cooperation. Cooperation in the energy sector is a high priority (The Ministry of Foreign Affairs of the Russian Federation, 2008; The Ministry of Foreign Affairs of the Russian Federation, 2018). Russia, Kazakhstan, Uzbekistan, and Turkmenistan (as the largest producers of traditional energy in Central Asia) are interested in maximizing their benefits from the export of energy resources, which has a positive impact on their foreign trade and balance of payments (Ananyeva, 2019; Bakdolotov et al., 2017; Smaliukienė & Monni, 2019). However, these objectives can only be achieved within

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the framework of compliance with mutually beneficial conditions of cooperation in the joint development and operation of oil and gas pipelines, coordinated energy pricing policy, the formation of cartel agreements on energy exports, and development and research of new hydrocarbon deposits in these countries (Dorian, 2006; Dudin et al., 2019).

Active energy cooperation between Central Asian countries and Russia falls within the purview of the Eurasian Economic Union (EAEU). Under the aegis of the EAEU, the project "Concepts of building a common electric power market of the EAEU" was approved on March 10, 2015. It outlines the milestones, goals, and objectives of the energy market, as well as the means of interaction among its participants (Eurasian Economic Union, 2016). Besides building a conventional electric power market under the EAEU, consolidated markets for petroleum, oil products, and natural gas are being formed. Creating a platform for integrating the manufacturing and production facilities of the EAEC member states into a single economic space was the fundamental purpose behind building a common energy market. Based on preliminary estimates by the SKM Market Predictor, the expected efficiency because of the increased use of the network transfer capacity within the EAEU will be13%for the Russian Federation, 28%for the Republic of Kazakhstan, and 19% for the Kyrgyz Republic (Balyberdin, 2016).

The Russian Federation is attempting to revive its role as the leading supplier of Central Asian hydrocarbons to the global market, but primarily to Europe. Along with negotiations with Kazakhstan and Turkmenistan on coordinating the Caspian Coastal pipeline construction, Russia, in liaison with Uzbekistan, is developing a design for the Central Asia-Center-1 and Central Asia-Center-2 gas pipeline systems (ChelPipe Group, 2019). Gas is expected to be transported from Turkmenistan through Uzbek territory to central Russia. However, its prospects, including that of the Caspian Coastal pipeline, remain ambiguous. By contrast, the construction of the Central Asia–China gas pipeline in 2009 allowed Turkmenistan to counter Russia's monopoly of Turkmen exports. Before 2009, 90% of Turkmen gas exports were transported via the Russian pipeline, and the remaining 10 % were sold to Iran, whereas in 2010, Turkmenistan opened the Dauletabad–Sarakhs–Khangiran pipeline for a nominal supply of 10 billion m^3ofnatural gas to Iran (Indeo, 2018).

The outstanding issue of hydrocarbon transit tariffs is the primary stumbling block in Russia's energy relations with Central Asia. This is because no transit tariff setting or adjustment exists either in the EAEU or the post-Soviet states for an integrated system of gas, oil, and petroleum products. Owing to increasing petroleum transit rates, Kazakhstan imposed a new tariff on Russian oil transit to China. In 2019–2023, this will amount to USD 15 per ton without value-added tax (VAT) (for the JSC KazTransOil pipeline), according to the Orders of the Minister of Energy of the Republic of Kazakhstan for 2019–2023 (KazTransOil, 2019). In 2015–2017, the average tariff was about USD12.5 per ton (without VAT). From January 1, 2018, the tariffs for oil transportation to China along with the territory of Kazakhstan through the Russian side of the pipeline, Priirtyshsk–Atasu, were reduced by 16.7%. Then, on April 1 of the same year, Kazakhstan increased its tariff in the same direction (Atasu–Alashankou) by 2.5 times (Chichkin, 2019). This can be attributed to Kazakhstan's plans to increase its oil deliveries to China, as well as growing competition between Kazakhstan and the Russian Federation for the Chinese oil market.

Moreover, China remains the largest oil importer. Increases in transit tariffs are also evident in the transit of Russian oil through Kazakhstan to Uzbekistan. The cost of Russian oil transit through Kazakhstan to Uzbekistan until December 31, 2017, was approximately USD 23 per ton without VAT (Oil Capital, 2017). However, in January 2018, the tariff was raised to almost USD 26 (Chichkin, 2019). It is not implausible that the tariffs will continue to grow on this route, if only because Kazakhstan has long been interested in increasing its oil deliveries to Uzbekistan (Chichkin, 2019). This may indirectly contribute to arise in Russian oil transit prices. If Russia and Central Asian countries cooperate seamlessly on the pricing of hydrocarbons and their deliveries, it will give them a useful tool to further their long-term interests across Central Asia. Given the context of Russia's weakened position, the purpose of this research is the development of an optimization model for determining transit tariffs for energy resources, ensuring maximum efficiency of cooperation between Russia and the countries of Central Asia. The mutual effectiveness of cooperation between Russia and Central Asia is discussed at length, particularly considering relations that would be the most economically advantageous. The effect of

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hydrocarbon transit tariffs on the efficiency of export-import operations among the countries is identified, and models for determining the optimum transit rates that would be mutually advantageous for partner countries are identified.

The remainder of the study is organized as follows: Section 2 explains the potential for cooperation between Russia and Central Asia in the energy sector. Sections 3, 4, and 5 present the information base and technology for determining the optimal values of gas and oil transit tariffs between Russia and Central Asia. Conclusion summarizes the research and justifies its importance for resolving energy cooperation issues between Russia and Central Asia.

2. Methods and materials

The authors developed an optimization model of gas and oil transit tariffs to increase the efficiency of energy relations between Russia and Central Asia.

The GDP elasticity indicators for each country relative to the total volume of energy exports to Central Asian countries (k_{EEi}) and energy imports (k_{EIi}) were used as indicators of economic effectiveness of energy export–import relations (Elsner et al., 2015):

$$k_{EEi} = \sum \frac{\Delta GDP_{ik}\,(\%)}{\Delta E_{ik}\,(\%)} \,/\, n, \qquad (1)$$

$$k_{EIi} = \sum \frac{\Delta GDP_{ik}\,(\%)}{\Delta I_{ik}\,(\%)} \,/\, n, \qquad (2)$$

where k_{EEi} is the coefficient of the i^{th} country's GDP elasticity of exports; k_{EIi} is the coefficient of the i^{th} country's GDP elasticity of imports; $\Delta GDP_{ik}(\%)$is the GDP growth rate of the i^{th} country over the k^{th} period, expressed as %;$\Delta E_{ik}(\%)$is the growth rate of total exports of the i^{th} country over the k^{th} period, expressed as %;$\Delta I_{ik}(\%)$ is the growth rate of total imports of the i^{th} country over the k^{th} period, expressed as %; and n is the number of periods.

To reflect the environmental factor in the efficiency of export-import energy operations, indicator ρ_{CO_2} was calculated for each examined country and the coefficient of environmental efficiency k_{Ecij} (Eqs. 3 and 4):

$$\rho_{CO_2 ij} = \mu_i \times E_{ij}, \qquad (3)$$

where $\rho_{CO_2 ij}$ is the indicator of the total CO_2 emission amount for the i^{th} country in relation to the j^{th} country; μ_i is the specific weight of CO_2emissionper unit of energy production in the i^{th} country; Eij is the value of exports of the i^{th} to the j^{th} country; and the i^{th} country is an exporting country, while the j^{th} country is an importing country.

$$k_{Ecij} = 1/\rho_{CO_2 ij} \qquad (4)$$

where $k_{Ecij}$is the coefficient of environmental efficiency of the i^{th} country's exports to the j^{th} country.

To quantify effectiveness, the integrated index *(I)* was calculated based on the following indicators:

$$I_{ij} = w_{EI} \times k_{EIijk} + w_{EE} \times k_{EEijk} + w_{Ec} \times k_{Ecijk} + \varepsilon, \qquad (5)$$

where $w_{EI}$is significance of the coefficient of GDP elasticity of energy imports; k_{EIijk} is a standardized value of the coefficient of the i^{th} country's GDP elasticity of the import of energy resources into the j^{th} country over

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the k^{th} period; w_{EE} is the significance of the coefficient of GDP elasticity of energy exports; k_{EEijk} is a standardized value of the coefficient of the i^{th} country's GDP elasticity of energy exports for the k^{th} period; w_{Ec} is the significance of the environmental performance factor; k_{Ecijk} is a standardized value of the environmental performance coefficient of energy exports for the i^{th} country over the k^{th} period; and ε is a model error.

It is proposed to build the integral indicator based on the results of factor analysis, where the following indicators are used as factors k_{EIijk}, k_{EEijk}, and k_{Ecijk}. All factors that are used in the model are stimulants: their increase positively characterizes the efficiency of export-import relations, which means that the cumulative effect of these indicators, taking into account the error, is 100%. The indicator that characterizes the influence (informativeness) of each factor in the study of the behavior of the system, and gives a total of 100%, is the indicator of dispersion. Therefore, it is proposed to use the percent of the variance of the corresponding factors as weighting factors when building the integral model. This approach to determining weighting factors is used in the works by (Fernando et al., 2012).

Using various measurement unit values and different dimensions in factor analysis is possible only after standardizing the indicators k_{EIijk}, k_{EEijk}, and k_{Ecijk} as follows (Zhang et al., 2018):

$$k_{sti} = \frac{k_i - \bar{k}_i}{y}, \quad (6)$$

where k_{sti} is the standardized value of the i^{th} indicator; ki is the calculated value of the i^{th} indicator; $\bar{k}_i$ is the arithmetic mean value of the i^{th} indicator over this period, and y is a standard deviation of the i^{th} indicator.

Next, a gravitational model is developed for determining the factors that affect the efficiency of export-import energy operations (Cantore & Cheng, 2018):

$$Y = a_0 \times X_1^{a_1} \times X_2^{a_2} \times X_3^{a_3}, \quad (7)$$

where Y is the integral indicator of the export-import energy operations effectiveness of the i^{th} country relative to the j^{th} country; X_1 is the export-import potential of the i^{th} country; X_2 is the export-import potential of the j^{th} country; X_3 is the transit tariff for the i^{th} country; and a_0, a_1, a_2, and a_3 are the elasticity coefficients of the relevant indicators.

Both parts of the equality were prologized, and the function was reduced to the form of a multifactor regression model to solve the function (7):

$$lnY = lna_0 + a_1 lnX_1 + a_2 lnX_2 + a_3 lnX_3 \rightarrow \bar{\bar{Y}} = \bar{\bar{a}}_0 + a_1 \times \bar{\bar{X}}_1 + a_2 \times \bar{\bar{X}}_2 + a_3 \times \bar{\bar{X}}_3, \quad (8)$$

where $\bar{\bar{Y}}$ is a dependent variable; $\bar{\bar{X}}_1 - \bar{\bar{X}}_3$ are independent variables; $\bar{\bar{a}}_0$ is the constant term; $a_1 - a_3$ are coefficients for independent variables; $\bar{\bar{Y}} = lnY$; $\bar{\bar{a}}_0 = lna_0$; $\bar{\bar{X}}_1 = lnX_1$; $\bar{\bar{X}}_2 = lnX_2$; $\bar{\bar{X}}_3 = lnX_3$; $a_1 - a_3$ are the elasticity coefficients of the relevant indicators (Eq. 7).

The Statistic determined unknown model parameters ($\bar{\bar{a}}_0, a_1, a_2, a_3$) as they are using the least squares method.

The integral indicator calculation (Eq. 5) is based on the standardized values of indicators, obtained by comparing values for the i^{th} country over the j^{th} period with sample means. Therefore, a positive value of the indicator shows that the effectiveness of export-import operations for the countries examined was above the sample mean. Negative values were indicative of the effectiveness being below the sample mean.

To study the effect of (gas and oil) transit tariffs on the energy trade development in Central Asian countries, two gravity models were developed, which differ in indicator X_3, the type of tariff under study.

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3. Data

The economic effectiveness of export-import operations is characterized by their profitability (Doan & Xing, 2018). Therefore, to assess the economic effectiveness of export-import operations, the level of a country's economic development expressed as GDP was used. Regarding the impact of energy trade volumes, the export of any product leads to an increase in GDP, whereas its import leads to economic contraction. At the same time, the opposite effect is possible. In case of energy shortages, the import of energy products stimulates economic development and GDP growth, as evidenced by conventional economic theory as proposed by Smith (2012), Ricardo (2015), and Mill (2012). Therefore, it is expedient to use the indicators of elasticity of each country's GDP concerning the total volume of exports to Central Asia based on the data in Table 3. This allows the study to reflect the effectiveness of export-import relations. Descriptive statistics are given in Tables 1-2. The calculations were made using Eqs. 1 and 2.

High values of the variation coefficients and the lack of stable dynamics (Table 1) indicate the uneven development of energy trade between the countries of Central Asia and in terms of the structure dominated by Russia and Kazakhstan and in dynamics. High variation coefficients (over 20%) also necessitate the standardization of data when building models to ensure sample uniformity.

Table 1. Descriptive statistics of data on energy trade between the countries of Central Asia

Country	Average exports to Central Asia, USD 1,000,000								Variation coefficient for the period, %
	2010	2011	2012	2013	2014	2015	2016	2017	
Russian Federation	52659	70355	74853	75670	58297	36435	22780	35760	37.52
Kazakhstan	8341	12789	13184	13207	10382	5436	3836	5285	42.77
Uzbekistan	389	426	274	448	278	154	158	152	43.70
Turkmenistan	464	1699	2644	2730	1907	1538	1174	1209	45.57
Kyrgyzstan	33.84	55.98	46.92	38.90	25.90	16.65	17.72	37.00	40.17
Tajikistan	0.17	0.03	0.20	0.04	8.20	8.83	8.72	8.62	104.28
Country	Average imports to Central Asia, USD 1,000,000								Variation coefficient for the period, %
	2010	2011	2012	2013	2014	2015	2016	2017	
Russian Federation	1.09	4.88	183.27	189.16	209.30	224.50	73.57	110.01	72.60
Kazakhstan	436.92	927.10	916.78	1037.30	401.56	292.88	283.55	326.94	55.87
Uzbekistan	196.97	176.99	214.52	257.47	136.85	103.73	87.16	131.27	35.81
Turkmenistan	0.94	1.37	1.70	1.99	1.52	1.04	1.23	1.27	25.15
Kyrgyzstan	168.33	189.54	229.79	252.10	228.93	152.01	77.52	124.32	33.37
Tajikistan	-	-	-	-	150.05	109.59	93.04	93.75	-

Source: Trade Map, 2019

An even more significant variation in the GDP growth rate in Central Asia (Table 2) is over 100%. Against the background of this indicator, the variation of the CO2 emission concentration indicator is less significant - does not exceed 25%.

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Table 2. Descriptive statistics for gross domestic product growth and indicator value of the share of CO_2 emissions per unit of energy production in Central Asia

Country	Gross domestic product growth		Indicator value of the share of CO_2 emissions per unit of energy production	
	Average value	Variation coefficient, %	Average value	Variation coefficient, %
Russian Federation	4.30	478.54	0.47	3.86
Kazakhstan	5.96	342.44	0.57	9.51
Uzbekistan	5.77	249.63	0.61	22.34
Turkmenistan	9.01	154.60	0.20	0
Kyrgyzstan	6.68	170.98	0.20	0
Tajikistan	5.29	231.78	0.20	0

Source: Knoema, 2019; Global Energy Statistical Yearbook, 2018

The production of hydrocarbons and their processing cause CO_2 emissions to increase in the atmosphere. Based on the official statistics on CO_2 emissions, hydrocarbon production is an integral factor for air pollution intensity due to the extraction and processing of energy resources. A pollution indicator is the specific weight of CO_2emission per unit of energy production. To describe the environmental component of international trade in energy resources, the indicator c_{CO_2}(Eq.3) was calculated for each country. This is an indicator ofCO_2emission amount in proportion to a country's exports to all the other countries in the study group on a standalone basis (in USD) (Global Energy Statistical Yearbook, 2018). When assessing the effectiveness of import operations, the environmental factor was not included, as import does not lead to environmental pollution. Based on the indicator of the total CO_2 emission amount, the coefficient of environmental efficiency $\left(k_{Ecij}\right)$ is calculated. It is the inverse of the CO_2 emission indicator (Eq.4) based on the data for 2010–2017.

For the integral assessment effectiveness of energy export and import operations, the following indicators were used: the coefficient of GDP elasticity of energy exports (as %), the coefficient of GDP elasticity of energy imports (as %), and the environmental performance indicator. These figures were calculated for Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, and Uzbekistan on a standalone basis for 2010–2017 (Eq. 5). Weighting factors (w) were determined through factor analysis using Statistica and correspond to indicator variance percentage values.

During the factor analysis, criteria for determining the optimum quantity of factors were not used, since the purpose of factor analysis in this study was not to reduce data but to determine the significance of all the indicators. Factor analysis based on data for 2010–2017 indicates that the 1st factor corresponds to the coefficient of GDP elasticity of energy exports, the 2nd factor to the coefficient of GDP elasticity of energy imports, and the 3rd factor to the coefficient of environmental efficiency of energy exports. The variance by factors (indicators) is distributed as follows: the dispersion percentage of the 1st factor is 54.8%, the 2nd factor is 32.4%, and the 3rd factor is 9.5%. The cumulative variance percent is 96.7%. The influence of factors unaccounted for in the model is 3.3%. The value of cumulative variance percent exceeds the level of significance 80% (Menke, 2018), which indicates the completeness of factorization and significance of factor analysis.

A gravity model was used (Eq.7) to determine the efficiency factors of export-import energy operations. The gravity model is used because it is a specialized model for evaluating the effectiveness of trade between two countries that are trading partners (Shumilov, 2017; Cantore & Cheng, 2018; Kabir et al., 2017). In this study, when evaluating the effectiveness of trade (gravity) between a pair of countries, indicators of their export and import energy potential (total energy exports and imports of the first and the second country) were used as mass indexes. This approach most accurately reflects the weight of countries in international trade when compared with GDP and other indicators mentioned above (Shumilov, 2017). The physical value of the distance was not used as a "distance." (Baier et al., 2017; Van Bergeijk, 2010; Bergstrand, 1985), since the studied countries are countries of the same region with approximately the same distance between them. The study used the "economic

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distance" - the tariff for the transit of hydrocarbons. It is transit tariffs, as determined in the study, that is the main limiting factor for the development of energy trade between the countries of Central Asia in modern conditions. The integral indicator of the export-import energy operations effectiveness calculated by Eq. (5) was used as a dependent variable, as opposed to the foreign trade volumes, as in the classical economic gravity model. This can effectively help determine the indicators that affect qualitative indicators of energy trade rather than quantitative ones—that is, the values of the elasticity coefficients of these indicators.

Consequently, an array of data for constructing gravity models was formed: 1) the integral indicator values for the effectiveness of export-import energy operations between the i^{th} and j^{th} Central Asian countries over 2010–2017, calculated according to the methodology proposed in the article (Y); 2) standardized values of the sum of total exports and imports of mineral fuels, mineral oils, and their distillation products in the i^{th} country over the period of 2010–2017 (X_1); 3) standardized values of the sum of total exports and imports of mineral fuels, mineral oils, and their distillation products in the j^{th} country (X_2); 4) standardized values of the gas transit tariff for applied by Russia (X_3'); 5) and the oil transit tariffs (X_3''). The standardized values of these indicators were used by applying Eq. (3).

For the model of the dependence of the efficiency of export-import relations on gas tariffs, an array of data formed for each country of pairs: Russia–Kazakhstan, Russia–Uzbekistan, Russia–Turkmenistan, Russia–Kyrgyzstan, Russia–Tajikistan, Kazakhstan–Uzbekistan, Kazakhstan–Turkmenistan, Kazakhstan–Kyrgyzstan, Kazakhstan–Tajikistan, Kyrgyzstan–Tajikistan. For the model of dependence of efficiency of export-import relations on oil tariffs - this is each country of the pairs: Russia–Kazakhstan, Russia–Uzbekistan, Russia–Turkmenistan, Russia–Kyrgyzstan, Russia–Tajikistan, Kazakhstan–Uzbekistan, Kazakhstan–Turkmenistan, Kazakhstan–Kyrgyzstan, Kazakhstan–Tajikistan. Since these indicators were logarithmized when building a gravity model, observations with negative values were discarded.

The gas transit tariffs approved by the Federal Antimonopoly Service of the Russian Federation (2019) were taken as indicator X_3, as well as the tariffs applied by Kazakhstan (KazTransOil, 2019; Chichkin, 2019; Mazorenko, 2014) and Kyrgyzstan (EurAsiaDaily, 2018) for Central Asia. Thus, tariff modifications are established depending on the gas pipeline type, the availability of a cooperation agreement, and possible preferential terms or sanctions (TASS Russian Information Agency, 2017).

Oil transit tariffs are even more differentiated by the Federal Antimonopoly Service of the Russian Federation (2019). Commercial institutions and departments of Kazakhstan have not defined unified tariffs (Oil Capital, 2017; Neftegaz, 2017; Mazorenko, 2014; But, 2019). Therefore, in this research, tariffs for oil transit through the trunk pipelines of Transneft PJSC, which has monopoly control over the oil transit, are taken as an indicator (X_3'') for Russia (Transneft, 2019). The Federal Antimonopoly Service approves any decision-making regarding changes in the Transneft tariffs. The tariff for oil supplies to refineries of the Russian Federation and EAEU member states was taken for analysis from the variation of tariffs. For Kazakhstan and Kyrgyzstan, the averaged indicators of tariff values relative to Central Asian countries were taken (Trade Map, 2019; Transneft, 2019; KazTransOil, 2019; Chichkin, 2019; Mazorenko, 2014; Oil Capital, 2017; Neftegaz, 2017; EurAsiaDaily, 2018).

4. Results

Table 3 shows the arithmetic mean values of the elasticities of GDP from imports and exports by the country for the study period. The average values can be calculated because the coefficient of variation of the calculated elasticity coefficient within one country does not exceed 5%, and the coefficients themselves demonstrate the same nature of influence throughout the entire period: either direct or reverse. Thus, the sample is homogenous and qualifies for statistical processing.

The values of elasticity coefficients indicate that GDP is elastic concerning the volume of foreign trade in energy resources (the elasticity coefficient exceeds 1) for Russia, Kazakhstan, and Turkmenistan. Therefore, the development of energy cooperation based on an increase in foreign trade in mineral fuels, mineral oils, and their

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distillation products by 1% will lead to an increase in the GDP of Kazakhstan by 2.93%, that of Russia by 1.47%, and that of Turkmenistan by 1.16% (Table 3). Thus, Kazakhstan is most interested in developing energy cooperation, particularly in increasing hydrocarbon exports, as, among other Central Asian countries, its GDP is most elastic to exports (+10.29).

For other countries, the GDP is less elastic, which is due to smaller volumes of international energy trade within Central Asia. Importantly, both exports and imports of energy resources within Central Asia have a positive impact on the development of the economy for the Russian Federation only. This is determined by the significant hydrocarbon reserves in the country, as well as its sufficiently developed industry and efficient energy policy.

Table 3. Values of GDP elasticity coefficients concerning the volumes of export and import of energy resources

Country	Values of GDP elasticity coefficients (%)		
	Relative to energy exports	Relative to energy imports	Relative to the volume of foreign trade in energy resources
Kazakhstan	+10.29	-0.06	2.93
Kyrgyzstan	-0.39	+0.55	0.52
Russia	+1.35	+0.07	1.47
Tajikistan	-1.89	-1.09	-0.90
Turkmenistan	+1.13	-0.26	1.16
Uzbekistan	+0.64	-0.44	-0.08

Based on the calculations, it is advisable for Kazakhstan, Kyrgyzstan, Russia, and Turkmenistan to increase the volumes of foreign trade in energy resources at the existing resource consumption level. For Tajikistan and Uzbekistan, an increase in trade should be accompanied by more profitable production and more efficient use of hydrocarbons.

For Russia, the GDP elasticity coefficients relative to imports and exports presented in Table 3 are positive. Therefore, any foreign trade energy operations with Central Asian countries would be profitable. Besides, the greater the foreign trade turnover, the higher the effectiveness. Only the environmental factor harms effectiveness: For Russia, the share of CO_2 emissions is 0.481 kCO_2/USD (Global Energy Statistical Yearbook, 2018), which is one of the highest indicators among Central Asian countries (after Kazakhstan, with 0.509). However, the significance of the environmental factor is not decisive because the degree of its influence is 9.5% (Eq. 2). On the contrary, for Tajikistan, both exports and imports adversely affect GDP. With any export-import ratio, the integral indicator of energy trade is negative for Tajikistan.

Based on the indicators of efficiency of export-import relations and the model of the integral efficiency indicator (Eq. 5), and considering the weighting factors, the model for calculating an integrated index of the effectiveness of export-import energy operations for Central Asian countries and Russia was developed:

$$I_{ij} = 0.324 \times k_{EIijk} + 0.548 \times k_{EEijk} + 0.095 \times k_{Ecijk} + e, \qquad (9)$$

Table 4 reflects the values of the integral indicators of mutual trade efficiency among the countries of Central Asia for 2017, calculated using Eq. 9. The calculation of the integral indicator is based on the values of the weighting factors determined using factor analysis. Therefore, the indicators of the adequacy of the obtained integral estimates are the statistical characteristics of the factor analysis—that is, the cumulative percentage of dispersion, which is 96.7%. The actual excess value of the cumulative percentage variance (96.7%) over the allowable 80% limit (Menke, 2018) indicates the completeness of factorization and the importance of factor analysis. Hence, the integrated assessment results of the effectiveness of mutual trade between Central Asia and Russia are adequate.

Based on the calculations (Table 4), export-import relations are most mutually beneficial for Russia–Kazakhstan, Russia–Kyrgyzstan, and Kazakhstan–Kyrgyzstan. However, export-import relations are

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economically inefficient for Uzbekistan–Kyrgyzstan, and Kyrgyzstan–Tajikistan. The Central Asian countries that do not carry out mutual trade in mineral fuels, mineral oils, and their distillation products are Uzbekistan–Turkmenistan (during 2010–2017) and Turkmenistan–Kyrgyzstan (in 2017). Therefore, for these pairs of countries, the integral indicator of export-import energy operations effectiveness was not calculated, and the gravity model was not constructed. For countries that do not export energy resources within the considered trading partners, k_{EEijk} = 0 and k_{Ecijk} = 0 (Eq. 9). For countries that do not import energy resources within the considered trading partners, k_{EIijk} = 0. The values of the integral effectiveness indicator of export-import energy transactions among Central Asian countries were calculated similarly for 2010–2016.

The constructed gravity models (Eqs. 4 and 5) indicate that the effectiveness of export-import relations for the country trading in mineral fuels, mineral oils, and their distillates mostly depends on its export-import potential. That is, the elasticity coefficient amounts to 1.01–1.06 regardless of the tariff type (gas or oil transit tariff). Thus, with the increase in the country's export potential by 1%, the effectiveness of export-import relations increases by 1.01–1.06 %. The elasticity of effectiveness relative to the export-import potential of a partner country is 0.62–0.69, which is indicative of lesser influence exerted by this factor (Table 4). Eqs. 4 and 5 confirm the hypothesis of the mutual negative impact of transit tariffs on the effectiveness of export-import relations—the elasticity coefficient is negative (-0.94 and -0.87). Thus, a conclusion can be drawn regarding the expediency of reducing transit tariffs in the modern conditions of foreign trade.

Table 4. Values of the integral indicator of the effectiveness of export–import energy relations between Central Asian countries and Russia for 2017

Trading partners of export–import energy relations	For the 1st trading partner	For the 2nd trading partner
Russia–Kazakhstan	+1.29	+0.71
Russia–Uzbekistan	+1.11	-0.83
Russia–Turkmenistan	+0.62	-0.44
Russia–Kyrgyzstan	+1.16	+0.25
Russia–Tajikistan	+0.9	-1.11
Kazakhstan–Uzbekistan	+0.57	-0.07
Kazakhstan–Turkmenistan	-0.67	+0.85
Kazakhstan–Kyrgyzstan	+0.32	+0.05
Kazakhstan–Tajikistan	+0.66	-1.04
Uzbekistan–Turkmenistan	-	-
Uzbekistan–Kyrgyzstan	-0.25	-0.13
Uzbekistan–Tajikistan	+0.19	-0.21
Turkmenistan–Kyrgyzstan	-	-
Turkmenistan–Tajikistan	+1.15	-0.67
Kyrgyzstan–Tajikistan	-0.18	-0.42

Next, the gravity model of the efficiency of export-import energy operations (Eq. 7) models for determining the effectiveness of export-import energy operations among the countries is used. Thus, reflecting the export-import potential of the countries involved in trade relations and economic barriers to the development of relations, the gas transit tariff (Eq. 10) and the oil transit tariff (Eq. 11) were developed:

$$Y = 4.35 \times X_1^{1.01} \times X_2^{0.62} \times X'^{-0.87}_3, \quad (10)$$

$$Y = 2.61 \times X_1^{1.06} \times X_2^{0.69} \times X''^{-0.94}_3, \quad (11)$$

To assess the statistical significance of the constructed models (10) - (11), the Fisher and Student criteria were calculated (Table 5).

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Table 5. Indicators of the statistical significance of models for determining the effective tariffs for the transit of gas and oil between Central Asian countries and Russia

Model for determining effective gas transit tariffs			Model for determining effective tariffs for oil transit		
Significance indicator	Value		Significance indicator	Value	
Fisher's F-test	Calculated 36.24; Tabular 2.73		Fisher's F-test	Calculated 29.47; Tabular 2.76	
Student's t-test	Calculated:		Student's t-test	Calculated:	
	For the constant term	3.47		For the constant term	3.01
	For X_1	3.06		For X_1	2.94
	For X_2	2.88		For X_2	2.35
	For X_3'	-2.97		For X_3''	-2.76
	Tabular 1.992			Tabular 2.001	

The statistical significance of the constructed gravity models is indicated by:

1) Sample sufficiency (63 / 79 observations): Indicators of mutual trade between Russia and Central Asian countries over eight years.
2) Sample homogeneity: Because of the standardization of indicators, the variation coefficient for each country did not exceed 10%;
3) The value of the determination coefficient, which amounts to 0.81 for Eq.9 and 0.78 for Eq. 10: The values of the determination coefficients show that the effectiveness of export-import energy operations among countries depends on the indicators included in the equations by 78–81%, with an acceptable level being not less than 74%;
4) Significant Student and Fisher tests (Table 5), for which the calculated values exceed the table in absolute value at a significance level of 95%.

To determine the optimal value of the gas and oil transit tariff, ensuring the maximum effectiveness of trade in energy resources between the countries of Central Asia, an optimization equation (12) was solved, in which the indicator X_3 is a controllable factor:

$$\begin{cases} Y = 4.35 \times X_1^{1.01} \times X_2^{0.62} \times X_3^{'-0.87} \rightarrow max \\ Y = 2.61 \times X_1^{1.06} \times X_2^{0.69} \times X''^{-0.94}_3 \rightarrow max' \end{cases} \quad (12)$$

where Y is the standardized value of the integral indicator of export-import relations effectiveness for the country; X_1 is the standardized value of the export-import potential indicator for the country under study; X_2 is the standardized value of the export-import potential indicator for the partner country; X'_3 is the standardized value of the gas transit tariff; and X''_3 is the standardized value of the oil transit tariff.

The optimal tariffs are calculated for oil and gas transit across the territory of Russia, Kazakhstan, and Kyrgyzstan. These tariffs ensure maximum effectiveness of cooperation between the countries of Central Asia—that is, the maximum value of effectiveness indicators (Eq. 12) for both countries. In this case, the resulting indicator of trade effectiveness, calculated by Eq.10, is determined for the i^{th} and the j^{th} country, after which the summarizing indicator is calculated as their product. The summarizing indicator of trade effectiveness calculated in this way reflects the interests of the exporting and importing country. The effectiveness of determining an optimal tariff for oil transit (Eq.11) is calculated similarly.

The values obtained from the application of the optimization equation (Eq. 12) are presented in Table 6.

Russia and Kazakhstan mainly provide oil and gas transit for all Central Asian countries, while Kyrgyzstan provides gas transit. Therefore, under the study's framework, the calculated optimal tariffs within the framework of the energy cooperation development are given in Table 6. Based on these data, it can be affirmed that the gas

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transit price for Russia should be reduced in Central Asian countries and it should make, on average, USD 0.84 per 100 km to increase the effectiveness of energy cooperation. That is, the current tariff should be reduced by USD 1.06. In turn, Russia should also reduce tariffs for the transit of Kazakh gas by USD 0.6, down to USD 0.82 per 100 km. For Kyrgyzstan, Russia should lower the level of the gas transit tariff by USD 2.61 down to 0.89 per 100 km (Table 6).

Table 6. Optimal values of the equilibrium tariffs for oil and gas transit in the framework developing energy cooperation between Russia and Central Asian countries

Transit country	Partner country					
	Russia	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Gas transit (USD/1000 m^3/100 km)						
Russia	-	0.82	0.89	0.9	0.82	0.79
Kazakhstan	0.82	-	0.9	0.9	1.2	1.0
Kyrgyzstan	0.89	0.9	-	1.8	2.1	2.1
Oil transit (USD/ton)						
Russia	-	12.5	11.1	11.8	11.5	12
Kazakhstan	12.5	-	10.2	10.5	11	11.1

5. Discussion

The justification of mutually beneficial energy cooperation in the context of expanding export-import operations with hydrocarbons for Russia and the majority of Central Asian countries using the elasticity coefficient was one of the most important scientific results of this research. These findings negate the dominant scholarly position regarding the desire of the Russian Federation to maintain monopoly control over energy resources of Asian countries (Maness & Valeriano, 2015; Öğütçü & Ma, 2019). The substantiation of the positive effect of building the potential of export-import relations between Russia and Central Asian countries as an economic factor is a significant result herein. It is expected to contribute to an increase in the growth rates of national economies.

The developed model for calculating the optimal transit tariffs for energy resources between Russia and the countries of Central Asia testified to the need for mutual reduction of their levels. Reciprocal reduction in transit tariffs for hydrocarbons on the part of Russia and the partner countries from Central Asia should be the main factor in achieving current economic goals. Based on the optimization results, the current tariff for the transit of Russian oil through Central Asian countries amounts to USD 21.4 per ton of oil, whereas, according to our calculations, the optimal tariff level (average for Central Asia) for Russia should be USD 11.72, which is 45%lower. In turn, it is advisable for Russia to reduce the tariff for Kazakh oil by another USD 2.5, resulting in USD 15 per ton of transit. Reducing transit tariffs among partner countries will contribute to expanding energy cooperation between Russia and Central Asian countries. Based on the gravity models developed (Eqs.10 and 11) and the data in Table 4, a decrease in the gas transit tariff by 1% will lead to an increase in the effectiveness of export-import relations by 0.87%.

Further, a decrease in the oil transit tariff by 1% will result in increased effectiveness of export-import relations by 0.94%, which will be conditioned by GDP growth. Russia does not have the same opportunity as China does to build bilateral relations with Central Asian countries. Thus, it is challenging to offer large-scale investments, massive infrastructure, and transport projects that can provide the region with an opportunity to implement its transit potential and participate in international trade routes. This has been emphasized in research before (Mohapatra, 2015; Pepe, 2017).

Further, this study's methodological approach determines the optimal level of transit tariffs for hydrocarbons between Russia and Central Asia, which can enable healthy partnership and competition. This would maximize the economic benefits of trading countries, with the potential to increase the export-import benefits in energy cooperation.

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Thus, maintaining the stability of the conditions for mutually beneficial energy cooperation between Russia and Central Asia under current conditions is possible by forming an equivalent tariff net for the transit of primary hydrocarbons such as crude oil and natural gas. Unlike other modern studies that have focused on political factors affecting transit tariffs (Doan & Xing, 2018; Kazantsev, 2016; Aminjonov, 2017; Zhang et al., 2018), this research suggests compliance with the equivalence principle in the proposed approach. That is, the establishment of the same transit costs between country-trading partners is a prerequisite for the development of equal relations between Russia and the countries of Central Asia. This would also enable the conditions of financial benefits or the mutual adjustment of various levels of transit tariffs to be compared in the event of a change in external conditions.

It seems unconditional that today, despite ample motive, Russia is unable to exercise control over energy resources in Central Asia. Therefore, it should pursue a policy of seeking balance with key players. If the logic of the Russian leadership were to be followed, interaction with China seems more preferable than with the United States. Therefore, Russia and China will have to find a mechanism for coordinating interests in the economic sphere to prove that any strategic partnership goes beyond declarative intent.

It should be noted that this study focused on a narrow range of problems regarding the optimization of oil and gas transit tariffs between Russia and Central Asia. However, more opportunities for energy cooperation exist, such as the development of a joint oilfield services market, the creation of financial-industrial groups, and the creation of joint industrial enterprises for the production and transit of energy resources. These issues are yet to be evaluated in terms of economic efficiency. In the authors' opinion, these aspects deserve a separate study, since, along with the scientific results obtained, they will contribute to improving the efficiency of energy cooperation between Russia and Central Asia.

Conclusion

This study developed a model of optimization of transit tariffs for energy relations between Russia and Central Asia within the context of increasing competition. When implementing export–import energy cooperation under existing conditions, trade is most efficient for Russia–Kazakhstan. High effectiveness is conditioned on countries having significant volumes of exports and imports, and their positive impact on the GDP of these countries. The values of elasticity coefficients confirm this. Trade relations are mutually beneficial for Russia–Kyrgyzstan, and Kazakhstan–Kyrgyzstan. However, the established trade relations are economically disadvantageous for Uzbekistan–Kyrgyzstan, and Kyrgyzstan–Tajikistan.

The effectiveness of export-import relations for Russia in the Central Asian energy sector depends to the greatest extent on its export-import potential. The increase in the export potential of one of the countries by 1% results in an increase in the effectiveness of export-import relations by 1.01–1.06% for this country. This confirms the hypothesis of the mutual negative impact of transit tariffs on the effectiveness of export-import relations.

The developed models for calculating optimization transit tariffs for hydrocarbons between Russia and Central Asia are based on the mutual reduction of tariff values and the principle of equivalence. The obtained results are of practical importance as they account for the mutual economic benefits of Russia and Central Asia. They help develop the principles of equivalence and partnership in cooperation. The basis for fruitful cooperation with major competing countries is also further developed.

References

Aminjonov, F. 2017, April 12. Russia's evolving energy interests in Central Asia and Afghanistan. *Bishkek Project*, Retrieved from https://bishkekproject.com/memos/26

Ananyeva, E. 2019. Russia in the Arctic region: Going bilateral or multilateral?, *Journal of Eurasian Studies* 10(1): 85-97. https://doi.org/10.1177/1879366518814655

Baier, S. L.; Kerr, A.; Yotov, Y. V. 2017. Gravity, distance, and international trade, in Blonigen, B.A., & Wilson, W.W. (Eds.). *Handbook of international trade and transportation.* Cheltenham: Edward Elgar Publishing, 15–78.

Bakdolotov, A.; De Miglio, R.; Akhmetbekov, Y.; Baigarin, K. 2017. Techno-economic modeling to strategize energy exports in the Central Asian Caspian region, *Heliyon* 3(4): e00283. https://doi.org/10.1016/j.heliyon.2017.e00283

Balyberdin, V. 2016. Common energy market: Will everyone benefit?, *Eff. Perform Manag*, 1: 54-61.

Bergstrand, J. H. 1985. The gravity equation in international trade: Some microeconomic foundations and empirical evidence, *The Review of Economics and Statistics* 67(3): 474-481. Retrieved from https://www.jstor.org/stable/1925976?seq=1#page_scan_tab_contents

But, M. 2019, January 3. Kazakhstan tariffs to provide Russian oil with a comfortable route to China economics today. *Economics Today*, Retrieved from https://rueconomics.ru/370919-tarify-kazakhstana-obespechat-rossiiskoi-nefti-komfortnyi-put-v-kitai

Cantore, N.; Cheng, C. 2018. International trade of environmental goods in gravity models. *Journal of Environmental Management* 223: 1047-1060. https://doi.org/10.1016/j.jenvman.2018.05.036

ChelPipe Group. 2019. Central Asia–Center Gas Trunk Pipeline. Retrieved from https://chelpipe.ru/about/realized-projects/srednyaya-aziya-tsentr

Chichkin, A. 2019, January 16. Transit separatism in the oil and gas space of the EAEU/CIS dominates. *Eurasia's Rhythm,* Retrieved from https://www.ritmeurasia.org/news--2019-01-16--tranzitnyj-separatizm-na-neftegazovom-prostranstve-eaes-sng-dominiruet-40554

Doan, T.; Xing, Y. 2018. Trade effectiveness, free trade agreements, and rules of origin, *Journal of Asian Economics* 55: 33-41. https://doi.org/10.1016/j.asieco.2017.12.007

Dorian, J. 2006. Central Asia: A major emerging energy player in the 21st century, *Energy Policy* 34: 544-555. https://doi.org/10.1016/j.enpol.2005.11.009

Dudin, M. N.; Frolova, E. E.; Protopopova, O. V.; Mamedov, A. A.; Odintsov, S. V. 2019. Study of innovative technologies in the energy industry: nontraditional and renewable energy sources, *Entrepreneurship and Sustainability Issues* 6(4): 1704-1713. http://doi.org/10.9770/jesi.2019.6.4(11)

Elsner, W.; Heinrich, T.; Schwardt, H. 2015. Real-world markets: Hierarchy, size, power, and oligopoly, direct interdependence, and instability, in Elsner, W., Heinrich, T., Schwardt, H. *The microeconomics of complex economies. Evolutionary, institutional, and complexity perspectives.* Academic Press, 157–190.

EurAsiaDaily. 2018. Gas pipeline to China: Kyrgyzstan wants to earn money the same as Kazakhstan. Retrieved from https://eadaily.com/ru/news/2018/06/21/gazoprovod-v-kitay-v-kirgizii-hotyat-zarabatyvat-kak-v-kazahstane

Eurasian Economic Union. 2016. Decision of the Supreme Eurasian Economic Council No. 20. About the program for forming a common electric energy market of the Eurasian Economic Union. Retrieved from https://docs.eaeunion.org/docs/ru-ru/01415044/scd_11042017_20

Federal Antimonopoly Service the Russian Federation. 2019. Tariff regulations. Retrieved from https://fas.gov.ru/spheres/24

Fernando, M.; Samita, S.; Abeynayake, R. 2012. Modified factor analysis to construct composite indices: Illustration on urbanization index. *Tropical Agricultural Research* 23(4): 327-337. Retrieved from https://www.pgia.ac.lk/files/Annual_congress/journel/Journal%20_23_No%204/Full%20Papers/48.Mr.M.A.C.S.S.%20Fernando.pdf

Global Energy Statistical Yearbook. 2018. CO_2 emissions data. Retrieved from https://yearbook.enerdata.net/co2-fuel-combustion/CO2-emissions-data-from-fuel-combustion.html

Indeo, F. 2018, July 19. Turkmenistan's energy strategy: Aiming to the diversification of export routes. *Central Asian Bureau of Analytical Reporting*, Retrieved from https://analytics.cabar.asia/en/turkmenistan-s-energy-strategy-aiming-to-the-diversification-of-export-routes

Kabir, M.; Salim, R.; Al-Mawali, N. 2017. The gravity model and trade flows: Recent developments in econometric modeling and empirical evidence, *Economic Analysis and Policy* 56: 60-71. https://doi.org/10.1016/j.eap.2017.08.005

Kazantsev, A. 2016. *Prospects for cooperation between Russia and China in Central Asia.* London: Published by NP RSMD.

KazTransOil. 2019. Regulation and tariffs. Retrieved from https://www.kaztransoil.kz/ru/o_kompanii/regulirovanie_i_tarifi/

Knoema. 2019. Retrieved from https://knoema.ru/atlas/topics/%D0%AD%D0%BA%D0%BE%D0%BD%D0%BE%D0%BC%D0%B8%D0%BA%D0%B0/%D0%9D%D0%B0%D1%86%D0%B8%D0%BE%D0%BD%D0%B0%D0%BB%D1%8C%D0%BD%D1%8B%D0%B5-%D1%81%D1%87%D0%B5%D1%82%D0%B0-%D0%92%D0%B0%D0%BB%D0%BE%D0%B2%D0%BE%D0%B9-%D0%B2%D0%BD%D1%83%D1%82%D1%80%D0%B5%D0%BD%D0%BD%D0%B8%D0%B9-%D0%BF%D1%80%D0%BE%D0%B4%D1%83%D0%BA%D1%82/%D0%92%D0%92%D0%9F

Maness, R. C.; Valeriano, B. 2015. Energy salience and situational coercive diplomacy: Comparison of coercive energy policy in the Caucasus and Central Asia, in *Russia's coercive diplomacy*. London: Palgrave Macmillan, 138–172.

Mazorenko, D. 2014, September 10. How much does Kazakhstan earn on gas and oil transit? *Power*, Retrieved from https://vlast.kz/jekonomika/skolko_kazahstan_zarabatyvaet_na_tranzite_gaza_i_nefti-7306.html

Menke, W. 2018. Factor analysis, in *Geophysical data analysis*. Academic Press, 207–222.

Mill, J. 2012. Principles of political economy. North Charleston, SC: Published by Create Space Independent Publishing Platform.

Mohapatra, N. 2015. Geopolitics of energy security in Central Asia: Implications for India, in Pant, G. (Ed.). *India's emerging energy relations. India studies in business and economics.* New Delhi: Springer, 103–124.

Neftegaz. 2017. While Kazakhstan approves tariffs for the Russian oil transit, in Uzbekistan fuel has risen in price by 70%. Retrieved from https://neftegaz.ru/news/view/166740-Poka-Kazahstan-utverzhdaet-tarify-na-tranzit-rossiyskoy-nefti-v-Uzbekistane-toplivo-podorozhalo-na-70

Oil Capital. 2017. KazTransOil approved tariff for the transit of Russian oil to Uzbekistan. Retrieved from https://oilcapital.ru/news/transport/16-11-2017/tarif-na-tranzit-rossiyskoy-nefti-v-uzbekistan-utverdila-kaztransoyl

Öğütçü, M.; Ma, X. 2019. Growing links in energy and geopolitics. China, Russia, and Central Asia. Retrieved from http://www.eisourcebook.org/cms/Links%20between%20energy%20&%20geopolitics,%20China,%20Russia,%20&%20Central%20Asia.pdf

Pepe, M. 2017. Eurasian transport integration beyond energy: Geoeconomic transformation and geostrategic response. In: *Beyond energy. Energy policy and climate protection.* Wiesbaden: Springer, 247–430.

Ricardo, D. 2015. *On the principles of political economy and taxation.* Cambridge: Published by Cambridge University Press. https://doi.org/10.1017/CBO9781107589421

Shumilov, A. 2017. Estimating Gravity Models of International Trade: A Survey of Methods, *Higher School of Economics Economic Journal* 21(2): 224-250.

Smaliukienė, R.; Monni, S. 2019. A step-by-step approach to social marketing in energy transition, *Insights into Regional Development* 1(1): 19-32. https://doi.org/10.9770/ird.2019.1.1(2)

Smith, A. 2012. *Wealth of nations.* Hertfordshire: Published by Wordsworth Editions.

TASS Russian Information Agency. 2017, August 29. Gazprom is assessing the impact of new US sanctions on its activities. *Finanz.ru*, Retrieved from https://www.finanz.ru/novosti/aktsii/gazprom-provodit-ocenku-vliyaniya-novykh-sankciy-ssha-na-svoyu-deyatelnost-1002292667

The Ministry of Foreign Affairs of the Russian Federation. 2008. Treaty on Trade and Economic Cooperation between the Government of the Russian Federation and the Government of Turkmenistan. Retrieved from http://www.mid.ru/foreign_policy

The Ministry of Foreign Affairs of the Russian Federation. 2018. Treaty on Strategic Partnership between the Russian Federation and Turkmenistan. Retrieved from http://www.mid.ru/foreign_policy

Trade Map. 2019. Trade statistics for international business development. Retrieved from https://www.trademap.org

Transneft. 2019. Information about the tariffs for Transneft services on the transportation of oil/petroleum products through trunk pipelines. Retrieved from https://www.transneft.ru/information/113/2018/1

Van Bergeijk, P.; Brakman, S. (Eds.). 2010. The Gravity Model in International Trade. Cambridge: Published by Cambridge University Press. https://doi.org/10.1017/CBO9780511762109

Zhang, J.; Feng, Z.; Peng, H. 2018. Estimation and hypothesis test for partial linear multiplicative models, *Computational Statistics & Data Analysis* 128: 87-103. https://doi.org/10.1016/j.csda.2018.06.017

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THE INFLUENCE OF SELF-CONTROL, TIME PRESSURE, INFORMATION ALTERNATIVES, AND STOCK OUT ON CONSUMPTION DELAY

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Abstract. This study examines the delay model that is influenced by information alternatives, time pressure, self-control, and stock out. It also examines consumer response after delay occurred. The focus of this research is on the internal and external aspects, with individual as the analysis unit. The respondents of this research are 165 consumers in Generation Z. This research uses several product categories, such as laptop, hand phone, and fashion (with types of famous branded jeans, bag, shoes, and t-shirt). The respondents age range from 18-25 years old. The sampling technique used is purposive sampling. The sample requirement is the one who have postponed consumption and have relatively good self-control. The model in this research is analyzed using two step approach to Structural Equation Modeling (SEM).The research result shows that some hypothesis that relate the factor that can affect consumption delay, including time pressure, stock-out, self-control, and response after conducting consumption delay are supported. Only the effect of alternative information on delay that was not supported.

Keywords: self control; time pressure; information alternative; stock out; delay

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1. Introduction

The Indonesian Central Bureau of Statistics recorded the inflation of June 2018 is 0.59%. The inflation of 0.59% in June makes the inflation in the calendar year from January-May 2018 of 1.90% and year on year (yoy) 3.12%. The inflation in Indonesia has caused a decline in people's purchasing power and the tendency of people to delay

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their purchases, even though the product is very much needed. Consumers tend to keep using their old items as effectively as possible and keep trying to use them although the product should be replaced. For example, tire product that usually have 5-year expiration, but since the prices tend to rise and become expensive, people extend the use of tires up to 7 years. This also happens with fashion products. Fashion products that still can be used will not be replaced by a new product. The decline of purchasing power causes some consumers to tend to delay their purchase as a consequence of making savings due to the inflation. Purchase delay in Indonesian society has been carried out since two years ago (2017). The decline in purchasing power in lower middle class can actually occur. Changes in spending patterns, especially delays in purchasing durable goods can affect the income of the lower middle class. It is also explained that the decline in purchasing power is experienced by the lower middle class groups along with the decline in real income. In the upper middle class community groups, the thing that occurs is a combination between delaying consumption and changing consumption into saving. This is inseparable from the decline in their confidence in consumption (spending) in the middle of economic conditions that are considered uncertain (Detikfinance, 2018).

This research explains the concept of delayconsumption as a part of aspect in consumer behavior. Purchase delay is usually a strong tendency of one's nature (Odum, 2011) and it is consistent without intervention (Kirby, 2009). An individual considers purchasing delay by taking into account other possible outcomes of the delay (Friedel, DeHart, Madden, & Odum, 2014). DeHart and Odum (2015) stated that framing the delay aims to get a long-term benefits. Besides that, DeHart, Friedel, Frye, Galizio, and Odum (2017) stated that framing the delay's possible to account for delay uncertainty.

There are several issues raised in this research that explain the importance of delay consumption concept. The issues are positive discounting versus negative discounting, delay effect, self-control phenomenon, affection, and situation. The concept of positive discountingin finance can be used to explain consumer behavior. This concept shows that consumer will immediately use the money available to buy something. In other words, consumer cannot resist making immediate purchases and consuming them. Louweinsten (1987) argued that this concept cannot be used thoroughly to explain consumer behavior. Positive discounting is not always applied by consumers in spending their money. In this case, the concept of negative discounting explains that consumers can resist to not spending their money immediately. Consumers delay consumption for a product or service. This concept also shows that consumer can anticipate what will happen in the future. Consumers do an act of saving to keep things going in the future (Sugandini et al, 2018). Regarding with real consumer behavior, they are able to resist from being tempted to make purchase immediately (Hirsh, et al., 2010).When linked to the concept of impulse buying which have received much attention (Rook, 1987), the concept of delay consumption is at its extreme point (Sugandini et al., 2018). This means that this concept is something that is the opposite. The concept of impulse buying can be explained by positive discounting, while delay consumption can be explained by negative discounting. The concept of impulse buying is easily occurred because of several things, such as physical proximity, temporal proximity, and social comparison (Hoch & Loewenstein, 1991). Delay consumption occurs because there is a mechanism of self-control in consumer (Hoch & Lowenstein, 1991; Gast & Ledford, 2014). Self-control is the one that manage consumer to not easily let themselves to use their money. In the consumer's self, there is a mechanism to reduce the desire to consume and avoid regret in the future. Some of the mechanisms that will be discussed in this case are the concepts of avoidance, higher authority, and pre-commitment. Another concept that can explain delayconsumption is structure delay. Structure delay is related with several things such as time pressure and information alternative (Greenleaf & Lehmann, 1995). Another factor that is no less important in influencing delay purchase is situational factor. According to Joseph (2005), situational factor is able to provide direction as to why a consumer rejects or delay a purchase. This situational factor is important to be understood in this research, because this aspect is the variable that explains directly about consumer behavior without having to search for further information.

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The concept of delayconsumption also has an effect toward consumer affection. There is a difference of opinion on the effect of consumer affection delay consumption. Hui et al., (1998) argued that consumer will have negative affection if they perceive the time of fulfillment for a long desired goal. A person will experience anxiety and stress. However, the research that is conducted by Nowlis et al., (2004) shows that delays consumption can increase its own pleasure. The concept of delay is not always having negative effect toward consumer. But, there are some conditions that cause consumers can experience a delay situation. First, if consumers delay consumption of products that are hedonic or pleasant, customers do not perceive that delay is an unpleasant thing. Second, consumers do not feel that delay is something resent if they have the certainty to consume it. In other words, consumers are not only imagining consuming the product or service. Third, if the product that is delayed in its consumption is around us, then consumers would not perceive the delay. Fourth, Shu (2005) argued that delay is not a problem for someone if they are looking for the right time to consume it in the future. Consumers will not get pleasure if they consume it immediately. This research aims to explore and analyze the factors explaining about delayconsumption. This research examines the model of delayconsumption that focuses on the internal and external aspects of individual. This research also tests about the relationship between self-control and delay consumption structure that consists of time pressure, perceived stock out, and information alternative, and also examines the impact of decision of delay consumption toward consumer affection response.

The last issue that is discussed in this research is related with delay behavior carried out by consumers in the category of Generation Z. Consumers in Generation Z born between the years of 1995-2012. This generation is raised in the dominance of the use of information technology or net generation. This net generation is a very smart generation of technology and most of them use the internet as the main media (Lippincott, 2005). Delay usually occurs frequently to these consumers, because they are faced with many choices of online outlets and are not limited by time to make a purchase decision.

Penundaan pembelian pada masyarakat Indonesia dilakukan sejak tahun lalu. Penurunan daya beli yang menyebabkan konsumen berpikir keras dalam pembelian produk.

2. Literature review and hypotheses

Baumann & Odum, (2012) showed evidence that delay is a group of various psychological processes. For example, time perception, memory capacity (Wesley &Bickel, 2014) and one's intelligence (Shamosh et al., 2008). But, Killeen (2015) stated that the relationship of most of theoretical models only weakly explains psychological processes. The research conducted by Sugandini (2013) related to consumption delay in Indonesia shows that most consumers delay purchases because of high self-control before deciding on a purchase. Psychological factors that drive a person to postpone a purchase are fear of a wrong purchasing decision, which cause consumers in Indonesia prefer to delay their purchases. Another factor that causes consumers in Indonesia delay their purchases is the economic value of the products sold. The high rate of inflation causes a person to feel the need to recalculate the item to be bought because of increasing price. Paglieri, Addessi, Sbaffi, Tasselli, and Delfino (2015) theorized that delay is not caused by differential effect of consumption delay, but it is a result of motivation to maximize the delay outcome. In the end, we found the significant delay discount. DeHart (2017)found that delay is significantly correlated with outcome. Several prior researches also found that delay has a correlation with outcome differently (Friedel, et al., 2014, 2015) and delay framing condition (DeHart & Odum, 2015). The research result conducted by DeHart (2017) also explained that individuals who delay their consumption will reframe their choice by pushing a better self-control. This research proposes several factors that can affect consumption delay, including information alternative, time pressure, stock-out, self-control, and response after delaying purchases.

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2.1. Information Alternative and Delayed Consumption

Greenleaf & Lehmann (1995) stated that people delay to get more information about the product. Consumer will feel more satisfied and not confused about his decision when they get more information about the product (Jacoby, Speller and Kohn, 1974). Consumers continuously collect information if the cost of getting the information is smaller than the benefits they receive. The less information alternatives obtained by consumers, they will strengthen their decision to delay the purchases.

Hypothesis 1: Information Alternative has an influence toward onsumption delay

2.2. time pressure and delayed consumption

Greenleaf and Lehmann (1995) showed the main reason of the delay of decision making is because consumpers perceive that they don't spend enough time on their decision, they feel that buying a product is an unpleasant job, and they try to avoid it. Dhar and Nowlis (1999) conducted a research with the aim to test the effect of time pressure toward choice deferral. The result shows that when a conflict occurs, time pressure will decrease choice deferral with increasing attention to the unique appearance of a product. Besides, consumers in net generation have much time in choosing product because their purchasing can be done online. If these consumers feel that they do not have enough time to choose products, then they tend to delay it since the chance and time to choose products can be done anytime and anywhere through their gadget. The perception of time pressure has an impact on the decision to delay the purchase.

Hypothesis 2: Time Pressure has an influence toward consumption delay

2.3. Stock out and delayed consumption

Fitszimon (2000) shows a theory of psychological reactance which stated that when individual's freedom to choose is limited by the elimination of certain behaviors, the individual will give certain psychological reactions, namely an increase in certain aggressive activities. Stockout is a problem that is often complained of by many consumers, so it will have an impact on the delay consumption by the consumers. To strengthen this argument, Sugandini (2013) stated that when individual's freedom to choose is limited by the elimination of certain behaviors, they will give certain psychological reaction namely an increase in certain aggressive activities.

Hypothesis 3: Perception of Stockout has an influence toward consumption delay

2.4. Self-control and delayed consumption

Baumeister (2002) defined self-control and self-regulation as a capacity to give condition alternative and certain response. Kivetz and Simonson (2002) explained thatself-control is a result of one's effort to hold back and limit future behavior from a number of choices. This behavior is also called as pre-commitment or anticipatory self-command. Someone who has a high self-control has the ability to delay consumption. Individuals try to resist from influencing aspects to immediately buy a product or service by trying to avoid, delay, divert attention, and discipline by making life principles (Kivetz and Simonson, 2002).

Hypothesis 4: Self-controlhas an influence toward consumption delay

2.5. Delayed consumption and response

Hui, Thakor and Gill (1998) showed the reaction or response from consumers toward their delay of making decision. Emerging reactions are: perceived waiting time, affective response, and service evaluation. In many literature, the relationship between types of delay with perceived waiting time and affective response have not been specified clearly. Delay is explicitly assumed to have an influence to affective response and perceived waiting time (Hornick, 1984).

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Nowlis, et al., (2004) presented the influence of delay consumption toward consumption enjoyment. Osuna (1985) stated that there is an increase in stress and anxiety in waiting, and this stress can decrease consumer evaluation of their consumption experience. Nowlis et al., (2004) shows two consequences of delay on consumption enjoyment. First, consumers can anticipate product consumption in the future which might be fun if the results they enjoy are positive. Second, consumers who experience delay will feel frustrated and restless. Delay will have negative consequence toward consumption enjoyment. First, the theory of discounted utility that assumes a positive discount rate so that consumers tend to choose consumption as soon as possible rather than delay (Loewnstein and Prelec, 1992). In other words, consumers will not enjoy if they have to delay. Second, delay can cause anxiety and stress. It was further stated that this could occur in utilitarian products, but not in hedonic products (Hirschman and Holbrook, 1982)

Hypothesis 5: The decision of consumption delay has an influence toward consumer response.

3. Research method

The population of this research is all consumersof Z generation in Province of the Special Region of Yogyakarta (DIY), Indonesia that have delayed the purchase of a product from the last 3 months. This time limitation is determined because it relates to the respondents' ability to remember their psychological condition when buying products in the past one year. According to Menon et al., (1995), researchers must pay attention to the aspect of recall dependency. This means that researchers must pay attention to whether the questions posed by respondents are still within the limits of memory. If the question items ask something that has happened a little while ago, then the individual will have difficulty to remember the event that was asked in the questionnaire. The settings of this research are applied to certain product categories. Based on the result of exploratory research, the products that will be used in this research are laptop, hand phone, and fashion (with types of famous branded jeans, bag, shoes, and t-shirt). Based on the exploratory research, the products were chosen because they have a high frequency to be purchased by consumers at the age of 18-25 years old, and those products are the most often delayed.

The sampling technique that is used in this research is purposive sampling. This sampling has a non-probability aspect that meets certain criteria (Cooper and Schindler, 2003). These criteria are consumers who have postponed consumption and have relatively good self-control. The model that is used to analyze the data in this research is two step approaches to Structural Equation Modeling (SEM). The variable measurement model that is used in this research is Confirmatory Factor Analysis. The confirmatory factor analysis is conducted by researchers using the statistic application program, namely AMOS 21. There are six main constructs: information alternative, time pressure, stock out, self-control, delay consumption, and response that have 27 questionnaire items. The evaluation toward the model test result is good fit model. The evaluation result of the proposed model shows that all of the criteria that are used mostly show good results, which means that the model is good so that it can be accepted.

4. Results and discussion

4.1. Description of research respondents

This research shows that from 165 consumers that is used as respondents, 51.4% of them are male and 48.6%are female. The respondents in this research have an age range from 18 to 24 years old. Based on the amount of allowance per month, the average respondents have an allowance of Rp 1.000.000 – Rp 1.500.000. The information about the average allowance is aims to find out that they have enough ability to buy products.

This research is using the data collected from 165 consumers in Province of the Special Region of Yogyakarta (DIY), Indonesia. The data is obtained using questionnaire instrument equipped with in-depth interview. Before

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the questionnaire is used in the research, 30 consumers that is planned to become respondents were tested. After that, the validity and reliability of instruments were tested. From the analysis result, it is known that the questionnaire items presented are valid and reliable, so the questionnaire is distributed to 200 respondents based on the predetermined sample. Out of 200 distributed questionnaires, there are 165 respondents collected. This has fulfilled the requirements to be analyzed using Structural Equation Modeling as suggested by Hair (1998) and Bentler (1995).

4.2. Model evaluation using Two-Step Approach to SEM

The test result using structural equation model with AMOS program can be seen on Figure 1.

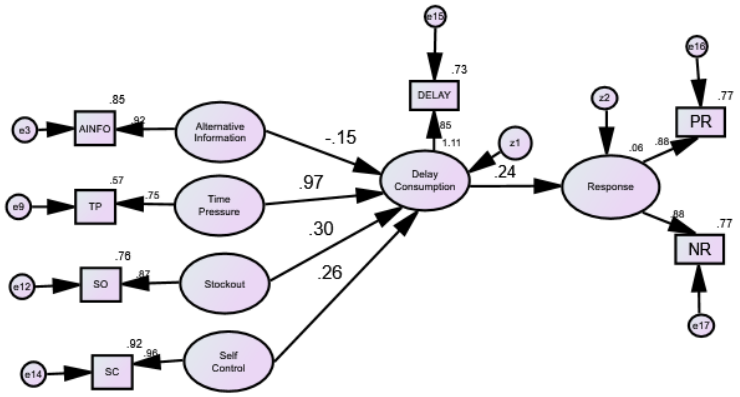

Figure 1.
SEM Delay Consumption

In order to test the hypothesis of causal relationship between information alternative, time pressure, stock out, self-control, delay decision, and response, it is presented the path coefficient that shows the causal relationship between these variables. These relationships are shown in Table 1.

Table1. Path Coefficient (Standardize Regression) between Variables

Path			Std Regression weight	C.R.	P	Hypothesis
Consumption Delay	◄	Alternative_Information	-0.150	-1.277	0.202	Not Supported
Consumption Delay	◄	Time_Pressure	0.969	5.650	0.000	Supported
Consumption Delay	◄	Stockout	0.296	2.278	0.023	Supported
Consumption Delay	◄	Self_Control	0.256	2.451	0.014	Supported
Response	◄	Consumption Delay	0.238	3.545	0.000	Supported

The hypothesis test is done by looking at the CR value. The CR value is significant if the CR value is > 2. With this criteria, it can be seen all paths are insignificant. Information alternative have no significant influence toward consumption delay, time pressure has an influence toward consumption delay, stockout has an influence toward delayconsumption, self-controlhas an influence toward consumption delay, and consumption delay has a significant influence toward response perceived by consumers after delaying their purchase.

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5. Discussion

The influence of information alternative on delay consumption (H1) is not supported. This research result is inconsistent with the previous research result. It cannot show a significant positive relationship between the search of information alternative and the decision of product purchase delay. Most of the consumers stated that the information from electronic media, non-electronic media, and social media does not affect their choice of product purchasing decision. Other information for products is usually used as a complement and it is not used as reference for choosing the product. Consumers tend to ignore other alternative information if the condition of the product is perceived as incompatible with themselves and the people around them. They are only guided by the opinions and views of the people around them. Therefore, this alternative additional information is not related to their decision to delay the purchase of fashion products. So, although a lot of alternative information is related to the product they want, they will not pay attention if the surrounding environment has not adopted the new model. This research result is also inconsistent with the result from Greenleaf and Lehmann 1995) who stated that people delay their consumption to obtain data or information. Consumers will feel more satisfied and not confused about their decision when they get more information (Jacoby, Speller and Kohn, 1974). Consumers will continually collect information if the cost of getting the information is smaller than the benefit they receive.

The influence of time pressure on delayconsumption (H2) is supported. This research result shows that time pressure has a significant positive influence with the decision of product delay. When consumers feel that they do not have enough time to make decision to purchase desired product, consumers tend to delay it. This time limitation appears because consumers do not have much time devoted to choose some desired product alternatives with the same relative uniqueness, there are other priorities that must be done so that the purchase of the product has not gotten a portion of time, and consumers are also faced with other things urgent when shopping. In relation with this time pressure, consumers will perceive pressure at a time if they are only spending their time shopping while waiting for the next lecture or class. Therefore, in such conditions, consumers tend to be in hurry and they perceive that the time to choose products is relatively insufficient, so they will not buy the product at that time. This research result is consistent with the result from Dhar and Nowlis (1999) who did a research that aims to test the effect of time pressure on choice deferral. The study that was conducted is analyze the cause of delay under time pressure, how degree and the type of conflict choice moderate this relationship, and how the decision process mediates the relationship. The result shows that when conflict occurs, time pressure will decrease choice deferral by increasing the attention on the uniqueness of product display.

The influence of stock out and delayconsumption (H3) is supported. When the product that is perceived by the consumer is getting rare, the higher the intention toward delay. The research result shows that this hypothesis is supported. This result supports the study conducted by Walter and Grabner (1975) which also shows the main reaction taken by consumers when facing stock out, namely switching brands and buying cheaper products, buying products at the same price, buting the same brand but with a different size, and delay purchases. This research result also supports Fitzimon (2000) which stated that perception of stock out which is a situation of loss of products from the market will call on consumers to delay their purchases. Stock out is a condition that indicates the inability of marketers to provide sufficient quantities of product to consumers when they want to buy the product.Innovative product can be successfully accepted by consumers when they have the convenience to buy directly. When consumers have got the information about innovative product and have a positive attitude toward the product, but they are unable to meet the product at the market or the store, it will discourage them from buying it. It is important to be known by marketers, that product success also lies in the ability to supply goods on the market. When consumers perceive difficulties in getting the products on the market, they will delay the purchases.

The influence of self-control on delayconsumption (H4) is supported. The causal relationship between the variables of self-control and delay consumption shows that it has a significant positive coefficient. Baumeister

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(2002) defined self-control and self-regulation as a capacity to give condition alternative and certain response. Self-control is a pattern of response that is started to begin to replace something with another. Self-control needs to be owned by someone when facing an impulse buting situation. This self-control can be done by reducing desire and willpower. Hoch and Loewenstein (1991) described how consumers try to control themselves in facing the choice of time-inconsistency and explained consumers' impatience using the model of decision making theory. This model explains how and why consumers experience can increase the desire for products and temporary rejection of long-term choices. Consumers self-control is framed in two psychological forces, which is reduce desire and willpower. This research result shows that the relationship between self-control and consumption delay is positive. It means that someone who has a good self-control tends to never rush into his decision. The best way a consumer can avoid purchasing behavior is to stay away from situations that might increase the desire to approach the behavior. This avoidance can be done both physically and sensory. Physically, consumers do not approach or go to the store and do not try to see or listen to the information about the product they want. This is consistent with the results of research that is conducted by Ariely and Wertenbroch (2002).

This research result shows that the decision of product purchase delay has a positive relationship with consumer affection response. There are two responses that arise from this delay. Some consumers stated that they enjoy and comfortable with the decision of product purchase delay they did. The reason is, they can have many opportunities to get more benefits. Some others also stated that delay caused them to feel uneasy and disappointed. They feel uneasy because of the possibility of the product being targeted by someone els, and there is a feeling of jealousy if someone else has used the product they want. This result is consistent with the delay concept which does not always have a negative impact on consumers. But there are some conditions that consumers can experience a delay situation. First, if consumers delay the consumption of products that are hedonic or pleasant, consumers do not perceive that delay is an unpleasant thing. Second, consumers do not feel that delay is something resent if hey have the certainty to consume it. In other words, consumers are not only imagining consuming it. Third, if the product that the consumption is delayed is around us, then we do not perceive the delay. Fourth, Shu (2005) argued that delay is not a problem for someone if they are looking for the right time to consume it in the future. Consumers will not get the pleasure if they consume it immediately.

6. Conclusion

This research result generally supports the model of delay consumption with the antecedent of information alternative, time pressure, stock out, and self-control, and response as a consequence of product consumption delays. The delay consumption model which integrates from various theoretical and empirical studies can add to the existing theoretical model of delay.

This research uses the data collected from 165 respondents. The research result shows that the strongest factor that affects consumption delay is time pressure, which is 96.9%.It shows that consumers who are faced with time limitations will be increasingly difficult to make purchases, which is different with consumers who have relatively much free time and will be easily make purchases. Consumers' responses toward delay are in balance between positive and negative responses. It shows that consumers emotionally respond to delay in purchases in different ways. For most consumers in the category of Generation Z (net generation), products that are delayed are not only the hedonic ones, but also the utilitarian. The Generation Z (net generation) is so familiar with the use of digital technology and social media. This generation has a very open-minded thinking. They are also spontaneous to express their feelings and mind. They are the most connected, educated, and up-to-date generation. Generation Z really utilizes the existence of smartphones/gadgets to get the goods or products or services they want. The average of Generation Z likes products that they think are cool. Thus, the delay behavior is very common in this net generation.

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7. Research limitations and recommendation for future research

This research only uses consumers' settings with the research objects of hand phone, laptop, and fashion. From the first pre test result, it is known that the case of delay consumption also occur in many women and men who have potential income. Cultural factors which also have an influence toward delay consumption as presented by Shu (1995) are not included in the research variables. For further research, it is best to include cultural factors in the research about delay.. For further research, the use of this variable needs to be tested once more to get the desired relationship. This is important to be done to ensure that this variable can indeed affect the delay of purchase.The results of many previous researches in delay include situational variable for consumers in the service industry. For research settings on tangible products (goods), situational variable should also be included in the research model as a variable that moderates the relationship of delay decision and consumer response.

References

Ariely, D. and K. Wertenbroch (2002). Procrastination, deadlines and performance: Self-control by precommitment. *Psychological Science*, 13(3): 219-224. https://doi.org/10.1111/1467-9280.00441

Baumann, A. A., & Odum. A.L. (2012). Impulsivity, risk taking and timing. *Behavioural Processes*, 90: 408-414. https://doi.org/10.1016/j.beproc.2012.04.005

Baumeister. R. F. (2002). Yielding to templation: Self control failure; impulsive purchasing and consumer behavior. *Journal of Consumer Research*, 28 (March): 670-676. https://doi.org/10.1086/338209

Bentler, P.M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software.

Cooper, D. R., & Schindler, P. S. (2003). *Business Research Methods* (8th Edition). Boston: McGraw-Hill. Companies, 345p.

DeHart, W. B., & Odum, A. L. (2015). The effects of the framing of time on delay discounting. *Journal of the Experimental Analysis of Behavior*, 103: 10-21. https://doi.org/10.1002/jeab.125

DeHart, W. Brady. (2017). Identifying the Underlying Components of Delay Discounting Using Latent Factor Modeling. *All Graduate Theses and Dissertations*, 6339. https://digitalcommons.usu.edu/etd/6339

Detikfinance https://finance.detik.com/berita-ekonomi-bisnis accessed on November 2018

Dhar. R., & Nowlis, S. M. (1999). "The effect of time pressure on consumer choice deferral," Journal of Consumer Research, Vol 25 (March), pp: 369-84. https://doi.org/10.1086/209545

Fitzsimons, G.J. (2000). Consumer Response to stockouts. *Journal of Consumer Research*, 27: 249-266. https://doi.org/10.1086/314323

Friedel, J. E., DeHart, W. B., Madden, G. J., & Odum, A. L. (2014). Impulsivity and cigarette smoking: Discounting of monetary and consumable outcomes in current and non-smokers. *Psychopharmacology*, 231(23): 4517-4526. https://doi.org/10.1007/s00213-014-3597-z

Friedel, J. E., DeHart, W. B., Mahamane, S, Odum, A. L., & Jordan, K. (2015, March). *Blue Goes Green I: increased delay discounting for better air quality.* Poster presented at the Intermountain Sustainability Summit 6th Annual Meeting, Ogden, UT.

Gast, D. L., & Ledford, J. R. (2014). *Single case research methodology: Applications in special education and behavioral sciences*. (2nd Ed). New York: Routledge, 345p.

Greenleaf, E. A., & Lehmann, D. R (1995). Reasons for substantial delay in consumer decision making. *Journal of Consumer Research*. 22(2): 186-199. http://dx.doi.org/10.1086/209444

Hair, Jr., Anderson, R.E., Tatham, R.L & Black, W.C. (1998). *Multivariate Data Analysis*. New Jersey: Prentice-Hall International, Inc., 152p.

Hirschman, E. C., & Holbrook, M. B. (1982). Hedonic consumption: Emerging concepts, methods, and propositions. *Journal of Marketing*, 46: 92–101. http://dx.doi.org/10.2307/1251707

Hirsh, J. B., Guindon, A., Morisano, D., & Peterson, J. B. (2010). Positive mood effects on delay discounting. *Emotion*, 10(5): 717–721. http://dx.doi.org/10.1037/a0019466

Hoch, S.J., & Loewenstein, G.F. (1991). Time-inconsistent preferences and consumer self-control, *Journal of Consumer Research* 17: 492-507. https://doi.org/10.1086/208573

Hornick, J. (1984). Subjective vs objective time measures: a note on the perception of time in consumer behavior, *Journal of Consumer Research*, 11(1): 614-18. https://doi.org/10.1086/208998

Horton, R.L. (1984). *Buyer behavior: a decision making approach*. Ohio: Bell and Howell Company, 312p.
.

Hui. M. K., Thakor, M. V., Gill, R. (1998). The effect of delay type and service stage on consumers' reactions to waiting. *Journal of Consumer Research*, 24 (March): 469-79. https://doi.org/10.1086/209522

Indonesian Central Bureau of Statistics, 2018. http://ghdx.healthdata.org/organizations/central-bureau-statistics-indonesia

Jacoby, J., Speller, D. E., & Kohn, C. A. (1974). Brand choice behavior as a function of information load. *Journal of Marketing Research*, 11(1): 63-69. https://psycnet.apa.org/doi/10.2307/3150994

Joseph, R. C. (2005). An Examination of Non Adoption and Decision Inertia: A Web Based Perspective. *Doctoral Dissertation Unpublished*. New York: The City University of NewYork.

Joseph, R. C. (2010). Individual Resistance to IT innovations. *Communication of the ACM*, 53(4): 144-146. https://doi.org/10.1145/1721654 1721693

Killeen, P. R. (2015). The arithmetic of discounting. *Journal of the Experimental Analysis of Behavior*, 103: 249-259. https://doi.org/10.1002/jeab.130

Kirby, K. (2009). One-year temporal stability of delay-discount rates. *Psychonomic Bulletin & Review*, 16: 457-462. https://doi.org/10.3758/PBR.16.3.457

Kivetz, R., & Simonson, I. (2002). Self-control for the righteous: Toward a theory of precommitment to indulgence. *Journal of Consumer Research*, 29: 199-217. https://doi.org/10.1086/341571

Lewin. K. (1951). Field Theory in Social Science. *Selected Theoretical Papers*. New York Harper. https://trove.nla.gov.au/work/14289400

Lippincott, J.K. (2005). *Net generation and libraries. in Educating the net generation*. Diana G. Oblinger & James L. Oblinger (Eds.). S.l.: Educause. Retrieved April 1, 2011, from http://www.educause.edu/educatingthenetgen/

Loewenstein G., & Prelec, D. (1992). Anomalies in intertemporal choice: Evidence and an interpretation. *The Quarterly Journal of Economics*, 107: 573-597. https://doi.org/10.2307/2118482

Loewenstein. G. (1987). Anticipation and the valuation of delayed consumption. *The Economic Journal*, 97(38): 666-84. https://doi.org/10.2307/2232929

Menon, S., & Kahn, B.E. (1995). The impact of context on variety seeking in product choice. *Journal of Consumer Research*, 22: 285-295. https://doi.org/10.1086/209450

Nowlis. S.W., Mandel, N., & Mc.Cabe, D.B. (2004). The effect of a delay between choice and consumption enjoyment. *Journal of Consumer Research*, 31(Dec): 502-510. https://doi.org/10.1086/425085

Odum, A. L. (2011). Delay discounting: Trait variable? *Behavioural Processes*, 87(1); 1-9. https://doi.org/10.1016/j.beproc.2011.02.007

Osuna, E. E. (1985). The psychological cost of waiting. *Journal of Mathematic Psychology*, 29(1): 82-105. https://doi.org/10.1016/0022-2496(85)90020-3

Paglieri, F., Addessi, E., Sbaffi, A., Tasselli, M. I., & Delfino, A. (2015). Is it patience or motivation? On motivational confounds in intertemporal choice tasks. *Journal of the Experimental Analysis of Behavior*, 103: 196-217. https://doi.org/10.1002/jeab.118

Purwanto, B. M. (2002). The Effect of Salesperson Stress Factors on Job Performance. *Jurnal Ekonomi dan Bisnis Indonesia*, 17: 150-169. https://doi.org/10.22146/jieb.6730

Ram, S., & Sheth, J.N. (1989). Consumer Resistance to innovation: the marketing problem and its solutions. *Journal of Consumer Marketing*, 6: 5-14. https://doi.org/10.1108/EUM0000000002542

Ram, S. (1987). A model of innovation resistance. *Advances in Consumer Research*, 14: 208-212. http://acrwebsite.org/volumes/6688/volumes/v14/NA-14

Rogers, E.M. (2003). *Diffusion of Innovations*. 5th edition. New York: The Free Press, 357p.

Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research*, 14: 189-99. https://doi.org/10.1086/209105

Shamosh, N. A., DeYoung, C. G., Green, A. E., Reis, D. L., Johnson, M. R., & Gray, J. R. (2008). Individual differences in delay discounting: Relation to intelligence, working memory, and anterior prefrontal cortex. *Psychological Science*, 19: 904-911. https://doi.org/10.1111/j.1467-9280.2008.02175.x

Shu. S, (2005). Choosing to consume later: determinants of future-biased choice. *Advances in Consumer Research*, 32: 67-68. http://www.acrwebsite.org/volumes/9029/volumes/v32/NA-32

Sugandini, D. (2013). Karakteristik inovasi, pengetahuan konsumen, kecukupan informasi, persepsi risiko dan kelangkaan dalam penundaan adopsi inovasi pada masyarakat miskin. *Dissertations*, *DIS 246-H-2012*. Universitas Gadjah Mada, Yogyakarta. http://etd.repository.ugm.ac.id/index.php?mod=penelitian_detail&sub=PenelitianDetail&act=view&typ=html&buku_id=58899

Sugandini D., Sudiarto, Surjanti, J., Maroah, S., & Muafi. (2018). Intention to delay: The context of technology adoption based on android. *International Journal of Civil Engineering and Technology*, 9(3): 736-746. http://www.iaeme.com/IJCIET/index.asp

Walter, C.K., & Grabner, J. (1975). Stockout cost models: empirical tests in a retail situation. *Journal of Marketing*, 39: 56-68. https://doi.org/10.2307/1250902

Wesley, M. J., & Bickel, W. K. (2014). Remember the future II: Meta-analyses and functional overlap of working memory and delay discounting. *Biological Psychiatry*, *75*: 435-448. https://doi.org/10.1016/j.biopsych.2013.08.008

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ENTREPRENEURSHIP LEARNING, POSITIVE PSYCHOLOGICAL CAPITAL AND ENTREPRENEUR COMPETENCE OF STUDENTS: A RESEARCH STUDY*

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Abstract. This study examines the direct and indirect effects of entrepreneurial learning on the formation of positive psychology capital, and explains the direct and indirect effects of entrepreneurial learning and positive psychological capital on student entrepreneurial competencies in Makassar City. This research is included in the type of explanatory research, which is non-experimental. The population in this study were 345 students who had participated in entrepreneurship education and training at state and private universities in South Sulawesi Province, while the sample size was 201 students who already had and were running a business. The results of this study indicate that entrepreneurial learning has a significant effect on the formation of positive psychology capital of students of entrepreneurship, and positive psychology capital has a significant influence on student entrepreneurial competence in South Sulawesi Province. The results of path analysis show that entrepreneurial learning has a significant effect on student entrepreneurial competence through mediation of positive psychology capital.

Keywords: entrepreneurship learning; positive psychological capital; entrepreneur competence; students

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1. Introduction

In the era of industrial revolution 4.0 which has implications for the importance of economic literacy and digital literacy, every country in the world is expected to be able to have competitiveness, especially in terms of innovation and creativity. However, there are still many countries that face high unemployment rates among their youth, especially young people with low education qualifications (Biavaschi et al., 2012; Hasan & Azis, 2018; Musa & Hasan, 2018), so that, mastering science and technology through education and training is one of the determining factors for the success of individual in the workforce (Biavaschi et al., 2012). In an innovation-based digital era, it is necessary to have the well-trained entrepreneurial technical expertise to deal with a rapidly changing global economic environment (Essia, 2012). Thus, there is a need to establish entrepreneurial learning that can form entrepreneurial competencies, especially at the level of higher education (Grubor, 2013; Haeruddin, Pick, & Thein, in press).

Students need tools, techniques, and theories to help them succeed in finding and directing their world. Some studies have found that entrepreneurship education and business literacy are still lacking among the younger generation, especially the aspects of entrepreneurial knowledge and skills is one of the efforts to improve the economic welfare of young people in the future (Ernst & Young, 2012).

The results of other studies from Ernst & Young (2011) confirm that experience in the corporate sector provides an important foundation in business practice. The informants in the study chose experience as employees as having the highest impact (33%). Higher education is prioritized by almost one third of informants (30%), followed by mentors (26%), families (21%), co-founders (16%), secondary education (13%), colleagues (12%), executives (11 %), friends (9%), and investors (5%). Despite having the second highest contribution according to the informants, higher education remains one of the important aspects that is able to provide experience in the formation of entrepreneurial competencies.

Many young people are reluctant to entrepreneurship due to psychological conditions that do not support. Psychological circumstances are valuable personal resources and capital for someone to succeed (Luthans, Luthans, & Luthans, 2004). Psychological capital is an extension of the concept of "economic capital", but differs from human capital or social capital (Luthans, Luthans, & Luthans 2004). In other words, psychological capital is the belief that a person has all the mental strength, capacity, and ability to do things for the sake of the progress of oneself and others. Psychological capital is related to "who I am". Psychological capital has four dimensions: self-efficacy, optimism, resilience, and hope (Luthans et al., 2004; Luthans, Avolio, Avey & Norman, 2007). In various literature, psychological capital is the primary determinant of the success of the entrepreneurial process, including in terms of the formation of entrepreneurial competencies. But in the entrepreneurial literature, more empirical evidence is needed to prove the importance of a positive relationship between psychological capital and entrepreneurial competence (Newman, Schwarz & Borgia, 2014).

In general, competencies include the knowledge, skills, attitudes, and behaviors needed to complete an activity (Morris et al., 2013). These include strategic thinking, a favorable orientation for change and innovation, the ability to build networks and build strategic alliances, risk assessment, identify opportunities and motivate others around common goals. Mitchelmore and Rowley (2013) propose a structure that establishes six principles of entrepreneurial skills: proper identification and niche market definitions, development of products or services that are in line with niche markets/product innovation, idea creation, environmental identification, recognizing and utilizing opportunities, and formulating strategies to take advantage of opportunities.

Entrepreneurship learning aims to guide all students not only, have an entrepreneurial mindset, but also have the competence and entrepreneurship skills (Hegarty, 2006). At the level of higher education entrepreneurial learning aims to build entrepreneurial spirit and culture, so that students have entrepreneurial intentions and competencies.

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Several studies have been conducted to find out entrepreneurial learning towards the success of students to become successful entrepreneurs. However, findings from several studies are often difficult to observe because there is still a lack of quantity of students who have successful businesses (Amoros & Bosma, 2014**)**. Seeing these findings, it is felt that there are still research gaps to see the impact of entrepreneurial learning on the formation of student entrepreneurial competencies.

Often, entrepreneurship learning is only related to aspects of knowledge and often neglects the formation of potential skills, abilities, and entrepreneurial attitudes. Therefore, an empirical study is needed to prove the relationship between entrepreneurial learning and the structure of positive psychology capital and entrepreneurial skills in students. Although various learning strategies have been introduced, there is no agreement on the right learning strategies to form entrepreneurial competencies. However, some experts have agreed on three main categories of entrepreneurial learning strategies, which include cognitive plans, meta-cognitive strategies, and resource management strategies (Soric & Palekcic, 2009; Clayton, Blumberg, & Auld, 2010).

2. Literature review

This article aims to determine the impact of entrepreneurial learning on the formation of entrepreneurial competencies through the formation of positive psychology capital in students, so based on this, the formation of student entrepreneurial competencies includes triggers, processes, and consequences. The trigger for the formation of student entrepreneurial competencies includes beliefs, goals, and contextual embeddedness. The process of developing competencies consists of entrepreneurial learning such as learning by doing (Cope & Watts 2000; Minniti & Bygrave, 2001), cognitive learning strategies (Vermetten et al., 1999; Baubonienė et al., 2018), meta-cognitive learning strategies (Huang, 2008), and Clayton, Blumberg, & Auld (2010) with dimensions of cognitive strategy, meta-cognitive strategies, and resource management strategies.

The consequences of the entrepreneurial process are divided into three categories which include: entrepreneurial competence, entrepreneurial attributes, and entrepreneurial skills (Gibb, 2005). Entrepreneurial behavior includes seeking and utilizing opportunities, taking initiatives to realize things, solving problems creatively, managing independently, being responsible, building networks effectively, arranging things creatively, and being able to take account of various risks. Entrepreneurial attributes of individuals that consist of orientation and ambition of achievement, self-confidence, performance, high locus of control, orientation to action, preference for learning by doing, perseverance, determination and creativity. Entrepreneurial skills consist of creative problem solving, negotiation skills, the ability to manage a business, project or situation holistically, think strategically, and make intuitive decisions under uncertainty. Based on this, the study of this article was based on the assumption that the process of developing entrepreneurial competencies through entrepreneurship learning aims to form entrepreneurial competencies through entrepreneurial attributes of individuals known as positive psychology capital.

Until now, scientists have identified several that determine one's competency in entrepreneurship, including their nature and personality, for example the big five (Ciavarella et al., 2004; Musa, Haeruddin, & Haeruddin, 2018), the tendency to take risks (Zhao et al., 2005), self-efficacy (Zhao et al., 2005), risks to entrepreneurial activity (Krueger 1993; Matthews & Moser, 1996), and gender (Marlow & McAdam, 2011; Haeruddin & Natsir, 2016; Azis, Haeruddin, & Azis, 2018). Among these determinants, entrepreneurship learning seems to be one of the important things, because the evidence in previous research shows that there is a clear relationship between entrepreneurial learning and entrepreneurial activity (Henderson & Robertson, 2000; Galloway & Keogh, 2006; Girdzijauskaite et al., 2019).

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Psychological tradition in entrepreneurship tends to focus on entrepreneurial description as a phenomenon, not as a way to inform entrepreneurial practice (Frese et al., 2012). This study looks at the psychological aspects of entrepreneurship which are positively related to the formation of entrepreneurial competencies, so that through this, it is possible to design interventions that can improve student entrepreneurial competence through entrepreneurial learning.

Psychological capital is a relatively new concept that is still being developed, especially in the formation of entrepreneurial competencies (Jensen & Luthans, 2006; Baron et al., 2013). Hmieleski and Carr (2008) found that psychological capital is able to explain the achievement of business performance through the formation of entrepreneurial competencies. Baron et al., (2013) found that entrepreneurs with higher psychological capital have a higher welfare because psychological capital is able to form good entrepreneurial competencies.

Based on the study, the conceptual framework of the process of developing student entrepreneurial competencies can be seen in Figure 1.

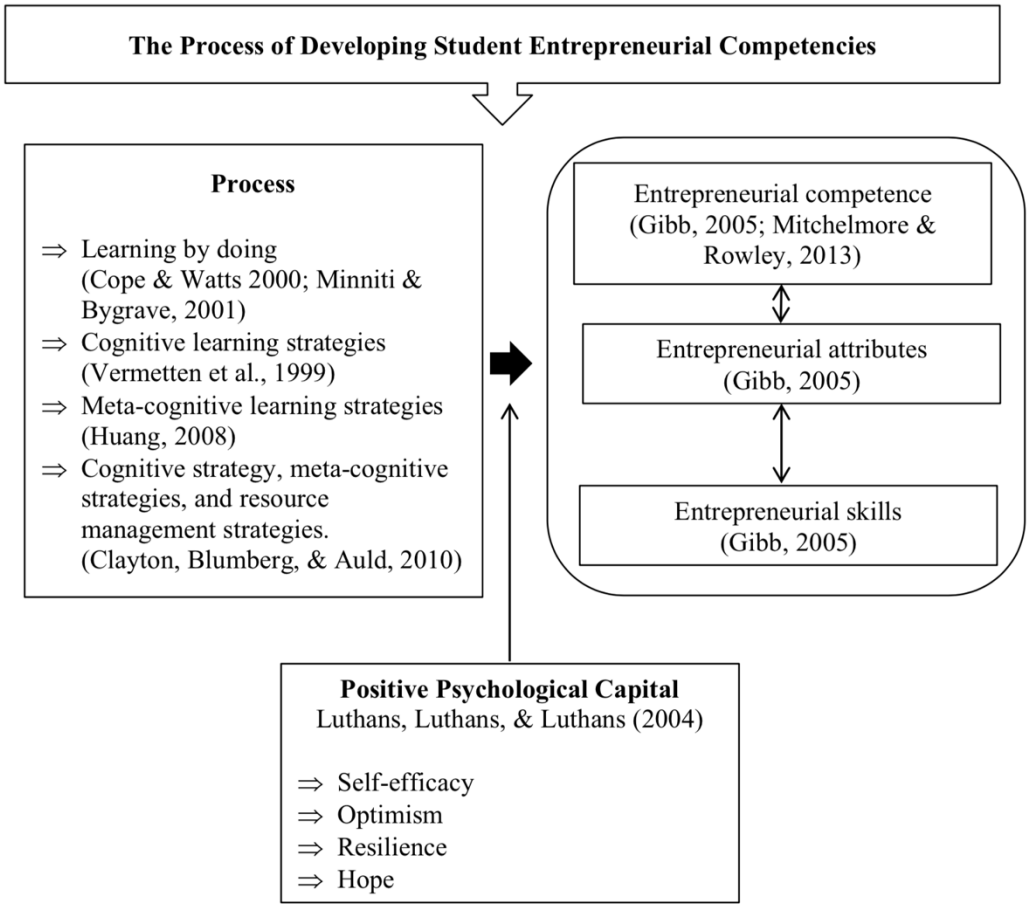

Fig.1. The Conceptual Framework of The Process of Developing Student Entrepreneurial Competencies

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3. Methods

This research is included in the type of explanatory research, which is non-experimental in nature and aims to analyze the influence of entrepreneurial learning and positive psychology capital on student entrepreneurial competencies in South Sulawesi Province, using a quantitative approach through parameter testing in answering hypotheses. To get data in accordance with the study design, the closed-ended question type was used. Entrepreneurship learning refers to Clayton, Blumberg, & Auld (2010) with dimensions of cognitive strategy, meta-cognitive strategy, and resource management strategies, the measuring scale used is ordinal. Positive psychology capital refers to Luthans, Luthans, & Luthans (2004) with dimensions, namely: self-efficacy, optimism, resilience, and hope, the measurement scale used is ordinal. Measurement of entrepreneurial competencies includes proper identification and niche market definition, development of products or services that are in line with niche markets/product innovation, idea creation, identification of the environment, recognizing and utilizing opportunities, and formulating strategies to take advantage of opportunities (Mitchelmore & Rowley, 2013), with an ordinal measurement scale.

The population in this study were 345 students who had participated in entrepreneurship education and training in South Sulawesi Province, while the sample size was 201 students who already had and were running a business. Data analysis techniques use statistical testing to verify the various problems presented in the hypothesis, so that generalization can be carried out, and based on path analysis. The purpose of path analysis is to find out the direct and indirect effects of a set of exogenous variables on endogenous variables (Hair et al., 2010). Based on the description, the variables examined in this article can be seen in Table 1.

Table 1. Research Variable

No.	Variable	Symbol	Dimension	Symbol
1.	Entrepreneurship learning (Clayton, Blumberg, & Auld, 2010)	X_1	Cognitive strategy	$X_{1.1}$
			Meta-cognitive strategy	$X_{1.2}$
			Resource management strategies	$X_{1.3}$
2.	Positive psychology capital (Luthans, Luthans, & Luthans, 2004)	X_2	Self-efficacy	$X_{2.1}$
			Optimism	$X_{2.2}$
			Resilience	$X_{2.3}$
			Hope	$X_{2.4}$
3.	Entrepreneurial competencies (Mitchelmore & Rowley, 2013)	Y_1	Market identification	$Y_{1.1}$
			Product development and innovation	$Y_{1.2}$
			Idea creation	$Y_{1.3}$
			Identification of the environment	$Y_{1.4}$
			Recognizing and utilizing opportunities	$Y_{1.5}$
			Take advantage of opportunities	$Y_{1.6}$

4. Results and discussion

The results of the instrument validity test indicate that all indicators in the research variable meet the data validity requirements. For more details can be seen in Table 2.

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Table 2. Validity Test

Variable	Dimension	Indicator	r	Information
Entrepreneurship learning (X_1)	Cognitive strategy ($X_{1.1}$)	$X_{1.1.1}$	0.821	Valid
		$X_{1.1.2}$	0.765	Valid
		$X_{1.1.3}$	0.774	Valid
		$X_{1.1.4}$	0.689	Valid
		$X_{1.1.5}$	0.822	Valid
		$X_{1.1.6}$	0.756	Valid
	Meta-cognitive strategy ($X_{1.2}$)	$X_{1.2.1}$	0.875	Valid
		$X_{1.2.2}$	0.875	Valid
		$X_{1.2.3}$	0.885	Valid
		$X_{1.2.4}$	0.768	Valid
	Resource management strategies ($X_{1.3}$)	$X_{1.3.1}$	0.829	Valid
		$X_{1.3.2}$	0.789	Valid
		$X_{1.3.3}$	0.772	Valid
		$X_{1.3.4}$	0.731	Valid
Positive psychology capital (X_2)	Self-efficacy ($X_{2.1}$)	$X_{2.1.1}$	0.845	Valid
		$X_{2.1.2}$	0.887	Valid
		$X_{2.1.3}$	0.756	Valid
	Optimism ($X_{2.2}$)	$X_{2.2.1}$	0.865	Valid
		$X_{2.2.2}$	0.872	Valid
		$X_{2.2.3}$	0.743	Valid
		$X_{2.2.4}$	0.882	Valid
	Resilience ($X_{2.3}$)	$X_{2.3.1}$	0.764	Valid
		$X_{2.3.2}$	0.751	Valid
		$X_{2.3.3}$	0.890	Valid
		$X_{2.3.4}$	0.746	Valid
	Hope ($X_{2.4}$)	$X_{2.4.1}$	0.825	Valid
		$X_{2.4.2}$	0.713	Valid
		$X_{2.4.3}$	0.734	Valid
		$X_{2.4.4}$	0.862	Valid
Entrepreneurial competencies (Y_1)	Market identification ($Y_{1.1}$)	$Y_{1.1.1}$	0.781	Valid
		$Y_{1.1.2}$	0.881	Valid
		$Y_{1.1.3}$	0.893	Valid
	Product development and innovation ($Y_{1.2}$)	$Y_{1.2.1}$	0.821	Valid
		$Y_{1.2.2}$	0.774	Valid
		$Y_{1.2.3}$	0.725	Valid
		$Y_{1.2.4}$	0.851	Valid
	Idea creation ($Y_{1.3}$)	$Y_{1.3.1}$	0.763	Valid
		$Y_{1.3.2}$	0.852	Valid
		$Y_{1.3.3}$	0.742	Valid
	Identification of the environment ($Y_{1.4}$)	$Y_{1.4.1}$	0.842	Valid
		$Y_{1.4.2}$	0.755	Valid
		$Y_{1.4.3}$	0.791	Valid
	Recognizing and utilizing opportunities ($Y_{1.5}$)	$Y_{1.5.1}$	0.765	Valid
		$Y_{1.5.2}$	0.882	Valid
		$Y_{1.5.3}$	0.761	Valid
		$Y_{1.5.4}$	0.821	Valid
	Take advantage of opportunities ($Y_{1.6}$)	$Y_{1.6.1}$	0.723	Valid
		$Y_{1.6.2}$	0.831	Valid
		$Y_{1.6.3}$	0.754	Valid
		$Y_{1.6.4}$	0.771	Valid

Source: Computed by authors

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The results of the validity test in Table 2 show that all indicators in entrepreneurial learning variables, positive psychology capital, and entrepreneurial competence have a pearson correlation (correlation coefficient) that is greater than 0.30, so that all of these indicators have met the data validity requirements. After the validity test is done, then the instrument reliability test is carried out as shown in Table 3.

Table 3. Reliability Test

No.	Variable	*Cronbach's Alpha*	Information
1.	Entrepreneurship learning (X_1)	0.811	Reliable
2.	Positive psychology capital (X_2)	0.790	Reliable
3.	Entrepreneurial competencies (Y)	0.874	Reliable

Source: Computed by authors

This study examines the direct and indirect effects of entrepreneurial learning on the formation of positive psychology capital, and explains the direct and indirect effects of entrepreneurial learning and positive psychology capital on student entrepreneurial competencies in South Sulawesi Province. Summary of research results can be seen in Table 4.

Table 4. Path Analysis Coefficient(s)

Direct Effect			
Path Analysis	**Path Coefficient**	**Prob.**	**Result**
Entrepreneurship Learning → Positive Psychological Capital	0.887	0.000	Significant
Entrepreneurship Learning → Entrepreneur Competence	0.613	0.001	Significant
Positive Psychological Capital → Entrepreneur Competence	0.754	0.015	Significant
Indirect Effect			
Indirect Path	**Path Coefficient**		
Entrepreneurship Learning → Positive Psychological Capital → Entrepreneur Competence	0.887 x 0.754 = 0.668		

Source: Computed by authors

Based on the results of data processing, the entrepreneurial learning path coefficient for positive psychological capital formation is 0.887, indicating that the influence of entrepreneurial learning on positive psychology capital formation is 0.887 with a probability value of 0.000. The results of this analysis indicate that entrepreneurship learning has a significant effect on the formation of positive psychology capital of students who become entrepreneurs. The coefficient of entrepreneurship learning pathway towards entrepreneurial competence is equal to 0.613 indicating that the influence of entrepreneurial learning on entrepreneurial competencies is 0.613. The probability value of entrepreneurship learning on entrepreneurial competencies is 0.001. The results of this analysis indicate that entrepreneurial learning has a significant effect on student entrepreneurial competencies that become entrepreneurs. The positive psychology capital path coefficient on entrepreneurial competence is 0.754, indicating that the positive psychological capital effect on entrepreneurial competency is 0.754. The probability value of family capital on business performance is 0.015, so the results of this analysis indicate that positive psychological capital has a significant effect on student entrepreneurial competencies that become entrepreneurs. The indirect coefficient of entrepreneurship learning on entrepreneurial competence through positive psychology capital is 0.668, indicating that the coefficient of entrepreneurial learning pathways towards entrepreneurial competence through positive psychological capital is 0.668.

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The findings of this study indicate that entrepreneurial learning influences the formation of positive psychology capital. This shows that entrepreneurial learning determines the level of formation of positive psychology capital (Sarasvathy, 2004). Entrepreneurship learning that is applied makes students learn from direct experience and other experiences around the campus environment. Positive psychological capital formation is the result of high learning intensity (Cope, 2003).

The test results in this study indicate that entrepreneurial learning influences entrepreneurial competencies. These results indicate that applied entrepreneurship learning has been able to cover the realm of skills. There are 3 approaches to entrepreneurship learning, which include entrepreneurial learning by emphasizing theoretical study, work-oriented learning, this learning encourages students to practice becoming entrepreneurs, fosters students' interest in becoming entrepreneurs with knowledge and skills in the field of entrepreneurship, and learning through entrepreneurial activities, this learning invites students to learn to be directly involved in business activities (O'Connor, 2013).

The findings of this study indicate that student entrepreneurship competencies are supported by appropriate learning processes within the institution. The curriculum in the institution contains a sequence of courses related to the formation of student entrepreneurial competencies that are in accordance with the cognitive, affective, and psychomotor levels of students. This is tailored to the expected competencies through a systematic process. These findings are in accordance with the findings of Markowska (2011) who suggested that learning entrepreneurship should be the main vehicle for the development of student entrepreneurial competencies. The research findings also show that universities have used learning with experience as one of the main methods of delivering entrepreneurial material, so that izn every learning the weight between knowledge and skills through practice is increasingly dominant in entrepreneurship learning. Makassar State University, as one of the research locations, has provided a center for entrepreneurship, external/internal funding for students who want entrepreneurship, community services and guest lectures, and business incubators. This shows that entrepreneurship learning is also focused on aspects of learning while working or direct observation.

Another finding in this study shows that positive psychological capital has a significant effect on entrepreneurial competence and there is an influence of entrepreneurial learning on entrepreneurial competence through mediating the formation of positive psychology capital. Entrepreneurial success is a series of positive results from the utilization of internal forces contained within humans (Seligman & Csikszentmihalyi, 2000). Entrepreneurship views success not only financially but also psychologically (Gorgievski et al., 2011). For entrepreneurs, non-financial incentives are more satisfying, while financial benefits do not always bring the greatest satisfaction (Alstete, 2008; Zainal et al., 2018). Meanwhile, the career success literature highlights that people are more appreciative of personal success than objective performance measures, given their full commitment to their work (Poon, 2005). In other words, successful entrepreneurs often feel more satisfied after all the difficulties and are far more satisfied after sharing a lot of money or wealth with the community in the form of charity, donations, sponsors and at the same time, transforming gratitude to the city for success (Csikzentmihalyi, 2000). Thus, entrepreneurial success is highlighted to comprise not only financial benefits but also measures of psychological success, such as satisfaction, gratitude, and readiness (Tang et al., 2010).

The findings of this study indicate that the most dominant dimension of positive psychology capital held by students is optimism. Optimism is a way of interpreting positive events as a matter that occurs as a result of self, is permanent, and can occur in various situations; and interpret negative events as things that occur due to things outside ourselves, are temporary, and only occur in certain situations (Luthans et al., 2007). Optimism is also interpreted as a hope for a positive and open future for settled self-development (Avey, Richard, Luthans, Mhatre, 2011).

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Optimistic students will be more realistic and flexible. Because, optimism in positive psychology capital is not only described as positive feelings but also a strong learning in terms of self discipline, analysis of past mistakes, and planning to prevent the occurrence of bad things. Students with high optimism will be able to feel cognitive and emotional implications when they get success (Luthans et al., 2007).

Conclusions

The results of this study indicate that entrepreneurial learning has a significant effect on the formation of positive psychology capital. Other findings show that positive psychology capital has a significant influence on entrepreneurial competence. The results of path analysis show that entrepreneurial learning has a significant effect on entrepreneurial competence through the mediation of positive psychology capital. The research findings have implications for the importance of entrepreneurial learning in higher education, both through education and training, to form positive psychological capital that can support the formation of entrepreneurial competencies.

The findings of this study are able to provide information on the importance of psychological factors in forming entrepreneurial competencies, so that entrepreneurship learning at the tertiary level must be designed to balance cognitive, affective, and psychomotor, especially in the affective aspect, positive psychology capital formation is very important because of the formation of entrepreneurial competencies very much determined by positive psychology capital. Future research is expected to conduct research by looking for other psychological factors that can shape student entrepreneurial competencies.

This research is inseparable from several limitations. The first limitation is, this study only managed to identify entrepreneurship learning models based on student perceptions, so that in the future it is hoped that the entrepreneurship learning model that has been identified can be developed in the form of development research. The second limitation is that this study only measures positive psychology capital and student entrepreneurship skills based on the perceptions of respondents who are still students, so that in the future this research can be developed to measure positive psychology capital and entrepreneurship skills of students who have completed college education and decide to become an entrepreneur.

References

Alstete, J.W. (2008). Aspects of entrepreneurial success. *Journal of Small Business and Enterprise Development* 15(3): 584-594. https://doi.org/10.1108/14626000810892364

Amorós, J. E., Bosma, N. (2014). *Global Entrepreneurship Monitor 2013 Global Report Fifteen Years of Assessing Entrepreneurship Across The Globe*. Global Entrepreneurship Research Association (GERA). https://www.gemconsortium.org/report

Avey, J., Richard, R.J., Luthans, F., & Mhatre, F.H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behavior, and performance. *Human Resource Development Quarterly*, 22 (2), 127-152. https://doi.org/10.1002/hrdq.20070

Azis, M., Haeruddin, M., & Azis, F. (2018). Entrepreneurship education and career intention: The Perks of being a woman student. *Journal of Entrepreneurship Education*, 21(1), 1-10. https://www.abacademies.org/articles/Entrepreneurship-education-and-career-intention-1528-2651-21-1-145.pdf

Baron, R. A., Franklin, R. J. & Hmieleski, K. M. (2013). Why entrepreneurs often experience low, not high, levels of stress the joint effects of selection and psychological capital. *Journal of Management***,** 0149206313495411. https://doi.org/10.1177/0149206313495411

Baubonienė, Ž., Hahn, K. H., Puksas, A., Malinauskienė, E. (2018). Factors influencing student entrepreneurship intentions: the case of Lithuanian and South Korean universities. *Entrepreneurship and Sustainability Issues*, 6(2), 854-871. http://doi.org/10.9770/jesi.2018.6.2(26)

Biavaschi, C., Eichhorst, W., Giulietti, C., Kendzia, M.J., Muravyev, A., Pieters, J., Rodriguez-Planas, N., Schmidl, R., & Zimmermann, K.F. (2012). *Youth unemployment and vocational training*. Bonn: Germany. http://ftp.iza.org/dp6890.pdf

Ciavarella, M. A., Buchholtz, A. L., Riordan, C. M., Gatewood, R. D., & Stokes, G. S. (2004). The big five and venture survival: is there a link? *Journal of Business Venturing*, 19(4), 465-483. http://www.sciencedirect.com/science/article/pii/S0883-9026(03)00093-4

Clayton, K., Blumberg, F.C., & Auld, D.P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *BJET*, 41, 349-364. https://doi.org/10.1111/j.1467-8535.2009.00993.x

Cope, J., Watts, G. (2000). Learning by doing – An exploration of experience, critical incidents and reflection in entrepreneurial learning. *International Journal of Entrepreneurial Behavior & Research*, 6(3), 104-124. https://doi.org/10.1108/13552550010346208

Cope, J. (2003). Entrepreneurial Learning and Critical Reflection: Discontinuous Events as Triggers for 'Higher-level' Learning. *Management Learning* 34(4), 429-450. https://doi.org/10.1177/1350507603039067

Csikzentmihalyi, M. (2003). Good business: leadership, flow, and the making of meaning. New York: Penguin Group. https://epdf.pub/good-business-leadership-flow-and-the-making-of-meaning30260.html

Ernst & Young. (2011). Nature or nurture? Decoding the DNA of the entrepreneur. Ernst & Young Global Limited. https://www.ey.com/Publication/vwLUAssets/ey-nature-or-nurture/$FILE/ey-nature-or-nurture.pdf

Ernst & Young. (2012). *Avoiding a lost generation: young entrepreneurs identify five imperatives for action.* Ernst & Young Global Limited.
https://www.ey.com/Publication/vwLUAssets/Avoiding_a_lost_generation_June_2013/$FILE/Avoiding_a_lost_generation_LoRes_FINAL.pdf

Essia, U. (2012). Entrepreneurial culturing of formal education programmes in Nigeria. *Journal of Sustainable Society*, 1(2), 52-62. http://www.paidafrica.org/paidwa/images/data/ENTREPRENEURIAL_CULTURING_OF_FORMAL_EDUCATION_PROGRAMMES_IN_NIGERIA.pdf

Frese, M., Bausch, A., Schmidt, P., Strauch, A. & Kabst, R. (2012). Evidence based entrepreneurship: cumulative science, action principles, and bridging the gap between science and practice. *Foundations and Trends in Entrepreneurship*, 8. https://www.cebma.org/wp-content/uploads/Frese-et-al-EBE-Trends-in-Entrepr.pdf

Galloway, L., S. Kelly, dan W. Keogh. (2006). Identifying entrepreneurial potential in students. *Working Paper*. No. 6, National Council for Graduate Entrepreneurship. http://gees.pbworks.com/f/entrepreneurialpotential.pdf

Gibb, A.A. (2005). Towards the Entrepreneurial University. Entrepreneurship Education as a lever for change. *A Policy Paper for the National Council for Graduate Entrepreneurship (NCGE)*. UK: National Council for Graduate Entrepreneurship. http://blog.ub.ac.id/yogidwiatmoko/files/2012/12/gibb_hannon.pdf

Girdzijauskaite, E., Radzeviciene, A., Jakubavicius, A. 2019. Impact of international branch campus KPIs on the university competitiveness: FARE method. *Insights into Regional Development*, 1(2), 171-180. https://doi.org/10.9770/ird.2019.1.2(7)

Gorgievski, M.J., Bakker, A. & Schaufeli, W.B. (2011). Work engagement and workaholism: comparing the self- employed and salaried employees. *The Journal of Positive Psychology*, 5(1), 83-96. https://doi.org/10.1080/17439760903509606

Grubor, A. (2013). Marketing aspects of socially responsible business. *Strategic Management*, 18(3), 030-036. https://bib.irb.hr/datoteka/650745.SM2013_3.pdf - page=32

Haeruddin, M., & Natsir, U. D. (2016). The cat's in the cradle: 5 personality types' influence on work-family conflict of nurses. *Economics & Sociology*, 9(3), 99-110. 10.14254/2071-789X.2016/9-3/9

Haeruddin, M. I. M., Pick, D., & Thein, H. H. (in press). Resistance and compliance in women's academic identity work in the Global South. *Higher Education Quarterly*. https://doi.org/10.1111/hequ.12204

Hair, Joseph F., et al. (2010). *Multivariate data analysis, 7th Edition*. New York: Prentice Hall International, Inc. https://is.muni.cz/el/1423/podzim2017/PSY028/um/_Hair_-_Multivariate_data_analysis_7th_revised.pdf

Hasan, Muhammad, dan Azis, Muhammad. (2018). *Pembangunan ekonomi & pemberdayaan masyarakat: strategi pembangunan manusia dalam perspektif ekonomi lokal*. Makassar: CV. Nur Lina Bekerjasama dengan Pustaka Taman Ilmu. http://eprints.unm.ac.id/10706/

Hegarty, C. (2006). It's not an exact science: teaching entrepreneurship in Northern Ireland. *Journal of Education + Training*, 48(5), 322-335, https://doi.org/10.1108/00400910610677036

Henderson, R., & Robertson, M. (2000). Who wants to be an entrepreneur? Young adult attitudes to entrepreneurship as a career. *Career Development International*, 5(6), 236-245. https://doi.org/10.1108/00400919910279973

Hmieleski, K. M. & Carr, J. C. (2008). The relationship between entrepreneur psychological capital and new venture performance. Frontiers of Entrepreneurship Research, 28(4). http://digitalknowledge.babson.edu/fer/vol28/iss4/1

Huang, S. (2008). Assessing motivation and learning strategies using the motivated strategies for learning questionnaire in a foreign language learning context. *Social Behavior and Personality*, 36(4), 529-534. https://doi.org/10.2224/sbp.2008.36.4.529

Jensen, S. M. & Luthans, F. (2006). Relationship between entrepreneurs' psychological capital and their authentic leadership. *Journal of Managerial Issues***,** 18(2)**,** 254-273. https://www.jstor.org/stable/40604537?seq=1 - page_scan_tab_contents

Krueger, N. (1993). The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability. *Entrepreneurship Theory and Practice*, 18(1), 5-21. https://doi.org/10.1177/104225879301800101

Luthans, F., Luthans, K.W. & Luthans, B.C. (2004). Positive psychological capital: beyond human and social capital. *Business Horizon*, 47(1), 45-50. http://chur.chu.edu.tw/bitstream/987654321/39064/2/Positive+psychological+capital_A_12_2.pdf

Luthans, F., Avolio, B.J., Avey, J.B. & Norman, S.M. (2007). Positive psychological capital: measurement and relationship with performance and satisfaction. *Personnel Psychology*, 60(3), 541-572. http://dx.doi.org/10.1111/j.1744-6570.2007.00083.x

Marlow, S., & McAdam, M. (2011). Analyzing the influence of gender upon high technology venturing within the context of business incubation. *Entrepreneurship Theory and Practice*, 36(4), 655-676. https://doi.org/10.1111/j.1540-6520.2010.00431.x

Matthews, C. H., & Moser, S. B. (1996). A longitudinal investigation of the impact of family background and gender on interest in small firm ownership. *Journal of Small Business Management*, 34(2), 29-43. https://www.researchgate.net/profile/Charles_Matthews3/publication/244958069_A_Longitudinal_Investigation_of_the_Impact_of_Family_Background_and_Gender_on_Interest_in_Small_Firm_Ownership/links/54ac434f0cf23c69a2b79841/A-Longitudinal-Investigation-of-the-Impact-of-Family-Background-and-Gender-on-Interest-in-Small-Firm-Ownership.pdf

Minniti, M., & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and Practice*, 25(3), 5-16. https://doi.org/10.1177/104225870102500301

Mitchelmore, S. and Rowley, J., (2013). Entrepreneurial competencies of women entrepreneurs pursuing business growth. *Journal of Small Business and Enterprise Development*, 20(1), 125-142. https://doi.org/10.1108/14626001311298448

Morris, M.H., Webb, J.W., Fu, J. and Singhal, S. (2013). A competency-based perspective on entrepreneurship education: conceptual and empirical insights. *Journal of Small Business Management*, 51(3), 352-369. https://doi.org/10.1111/jsbm.12023

Musa, C. I. and Hasan, M. (2018). The influence of social, economic, and demographic characteristic on working hours of micro, small, and medium enterprises (MSMEs) in Makassar City. *Journal of Physics: Conf. Series* 1028 (2018) 012181. https://iopscience.iop.org/article/10.1088/1742-6596/1028/1/012181

Musa, M. I., Haeruddin, M. I. W., & Haeruddin, M. (2018). Customers' repurchase decision in the culinary industry: Do the Big-Five personality types matter?. *Journal of Business and Retail Management Research*, 13(1), 131-137. 10.24052/jbrmr/v13is01/art-13

Newman, A., Schwarz, S. & Borgia, D. (2013). How does micro firm enhance entrepreneurial outcomes in emerging economies? The mediating mechanism of psychological and social capital. *International Small Business Journal* 32(2), 158-179. https://doi.org/10.1177/0266242613485611

O'Connor, A. (2013). A conceptual framework for entrepreneurship education policy: meeting government and economic purposes. *Journal of Business Venturing*, 24(1), 546-563. http://www.sciencedirect.com/science/article/pii/S0883902612000857

Poon, J.M.L. (2005). Career commitment and career success: moderating role of emotional perception. *Career Development International* 9(4), 374-390. https://doi.org/10.1108/13620430410544337

Sarasvathy, S.D. (2004). The questions we ask and the question we care about: reformulating some problems in entrepreneurship research. *Journal of Business Venturing* 19(5), 707-717. https://www.effectuation.org/wp-content/uploads/2017/05/2004-JBV-Questions-1.pdf

Seligman, M.E.P. & Csikszentmihalyi, M. (2000). Positive psychology. *American Psychologist* 55(1), 5-14. http://dx.doi.org/10.1037/0003-066X.55.1.5

Tang, J., Kacmar, K.M. & Busenitz, L. (2010). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing*, 27, 77-94. https://doi.org/10.1016/j.jbusvent.2010.07.001

Vermetten, Y.J., Lodewijks, H.G., & Vermunt, J.D. (1999). Consistency and variability of learning strategies in different university courses. *Higher Education*, 37(1), 1-21. https://doi.org/10.1023/A:1003573727713

Zainal, H., Parinsi, K.W., Hasan, M., Said, F., and Akib, H. (2018). The Influence of Strategic Assets and Market Orientation to the Performance of Family Business in Makassar City, Indonesia. *Academy of Strategic Management Journal*, 17(6). https://www.abacademies.org/articles/The-influence-of-strategic-assets-and-market-orientation-to-the-performance-1939-6104-17-6-308.pdf

Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), 1265-1272. http://dx.doi.org/10.1037/0021-9010.90.6.1265

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REFINANCING AS AN ELEMENT OF CONTROL OVER INFLATION

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Abstract. The article is devoted to the problem of understanding the role and application of refinancing of bank systems as an instrument of monetary policy that can influence the parameters of the money market and the real sector of economy. The author analyses the differences in the impact of refinancing instruments of the central banks to economic indicators of 7 countries, namely: The USA, New Zealand, Norway, South Africa, China, Australia and India. The countries with different levels of economic development and with different banking systems, as well as refinancing mechanisms were chosen for the study. The paper focuses on the impact of changes in the refinancing rate on inflation, as well as on the index of consumer prices. The aspect of management is also considered. Common methods, based on econometrics, can determine the dependence, which does not coincide with the notion of "governance" in its broad sense. Thus, the purpose of the work is an attempt to define the properties of a monetary policy instrument as a control element, which – when changed – can predetermine a change in the controlled factor. This is an attempt to contribute to the discussion of the role of central banks refinancing in managing inflation. In order to obtain the results the new mathematical analysis tool was used that incorporates the aspects of methods that assess monetary policy's impact on macroeconomic indices, which are not recognized within standard econometric models. For this purpose, the authors used a function that determines the dependence of the coefficient from the correlation between the refinancing rate and the inflation rate based on the length of the period of time used for the temporary data used, the time of the beginning of this period and the time lag of inflation data in relation to these rates of refinancing. The authors suggest that the tool to influence inflation on has a deterministic quality (i.e., depending on the external factors it may lead to the opposite results) and has no stable time lag.

Keywords: monetary policy instrument; refinancing rate; inflation; consumer price index

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1. Introduction

Central bank interest rate policies are the most common instruments to impact on macroeconomics in the developed countries. This statement is confirmed by the studies conducted by Caporale et al. (2017), Papadamou et al. (2015), Wulandari (2012), Rubio (2016), Nucera et al. (2017), Horvath (2018), Popescu (2014), Tvaronavičienė (2018), Sanfilippo-Azofra et al. (2018).

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In most countries, Central Banks carry out refinancing, taking into account its functions at both the micro and macro levels. At the micro level, refinancing helps to adjust the bank portfolio in case of unexpected changes in the structure of assets and liabilities. At the macro level, refinancing helps to implement monetary policies to achieve its long-term objectives.

Refinancing ensures the impact on inflation, the availability of imported goods to the population, the price competitiveness of goods, the level of production of the economic sectors, the availability of bank loans, the rate of state duties, the penalties of banks and tax authorities, the flow of funds in the stock market (Vasiljeva, 2017).

Central banks are considered drivers in the fight against inflation. It is they who are responsible to maintain stability of the national currency unit.

Scientists of different economic directions study interrelations and impact of the monetary policy instruments, including the main one – the refinancing rate, and the most important economic indicators, such as inflation.

Different countries have their own refinancing rates; in case of their changes, Central Banks try to impact on the interest rates in the economy. In England, it is the interest rate on commercial banks' reserves in the accounts in the Bank of England; in Japan, it is the rate of the Bank of Japan for unsecured one-day loans; in the USA, it is the target level of the interest rate on interbank loans; in the euro zone, it is the minimum rate at the sale and repurchase agreement (REPO) auctions with the European Central Bank.

An important aspect of refinancing is that by modifying the parameters of this instrument, the Central Bank sends a signal to the private sector to change the current monetary policy targets. Moreover, the refinancing mechanism allows the authorities establishing the interest rate benchmark for the financial market. The Reserve Bank of India and the Bank of Russia are the most striking examples of the signaling function of refinancing: their refinancing rate is an indicator and not a financial instrument.

The refinancing mechanism has two drawbacks. Announcements about changes in the refinancing terms of the banking sector may be misinterpreted by market participants. Besides, frequent adjustments of the refinancing rate lead to excessive volatility of the money market rates, which results in unplanned changes in refinancing scopes and money supply. As a result, the effectiveness of monetary policy becomes lower.

The existing studies have shown that there are dependencies between the MP instruments and the macroeconomic factors. We believe that when analyzing the impact of any MP instruments on the factors, the notion of "management" is replaced by "dependence", which is determined by econometric methods. The purpose of this paper can be considered as to determine the aspects related to the managing impact of the MP instruments. Thus, the authors consider it especially relevant to reveal the properties of macroeconomic indicators management with the help of various instruments.

2. Literature review

According to Alvarez and Sánchez (2018), inflation targeting forecasts are based on the principle that, given the long-term inflation goal, a Central Bank's own inflation forecast is the best intermediate goal which allows the Central Bank conducting a monetary policy with the desired compromise between the inflation deviation from the goal and the output deviation from the potential. The reason why the inflation forecast is the best intermediate goal is that it includes all the relevant data available to the Central Bank. It means the awareness of politicians' preferences in respect of the compromise between the inflation deviation from the target and the production volume from the potential, as well as the Central Bank's position regarding the mechanism of monetary policy transmission. In this respect, accurate inflation forecasts of the Central Bank are important for effective monetary

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policy, since poor quality forecasts can lead to an inappropriate choice of a policy which can lead to the inflation deviating from the target and destabilizing the production output. This general interest in inflation forecasts has renewed in the recent years after the dramatic changes in the global economy during the Great Recession and its aftermath.

Bayar (2018) offers new approaches to evaluate the inflation targeting methods based on the Taylor rule. It points to the lack of accuracy of the previously proposed econometric methods and offers better instruments to increase the accuracy of the made forecasts.

Gobbi et al. (2018) apply Keynesian models based on the equations describing the Taylor rule for inflation targeting, the inflation lag in the Phillips Curve, as well as the equations of the inflation rate, the CB's refinancing rate and the "natural" interest rate corresponding to the overall economic equilibrium. All the models are econometric. The authors study their sensitivity depending on the parameters and point out possible conditions for their application in order to achieve more accurate forecasts.

Horvath et al. (2018) use a model where the bank's interest rate depends on the market rate and some extra charge, adding variables from the Kashyap and Stein models (1995) to describe the crisis period. At the same time, shocks, including inflation factors, are included in one variable Z. Studying the impact of the interest rate and the inflation is very problematic.

Popescu (2014) applies an econometric autoregressive model linking the refinancing rate at the moment t, the rate at the previous moment, the change in the GDP over n periods, the inflation rate at a given moment, and the real effective exchange rate fluctuations.

Papadamou et al. (2015) have presented PVAR, an econometric model which determines the nominal short-term interest rate dependence on four variables: the GDP logarithm in real prices, the consumer price index logarithm, the overnight rate of the money market, and the rates for bank loans.

Barnett et al. (2019) considered which inflation rate should be focused on the currency union and argued that the best monetary policy should be focused on the gap in production, the trade terms, the price index inflation rate, and the gap of the real marginal costs.

A number of authors are studying of the monetary policy of the Bank of Norway.

Kondratov (2012) highlights the effectiveness of the Norwegian MP in maintaining prices stable, which allows Norway to achieve better macroeconomic performance and higher living standards in the country. Inflation targeting is the basis for ensuring the price stability.

Fatas et al. (2006) present results showing that the inflation was lower in the inflation-targeted countries than in the non-inflation-targeted countries (the inflation was lower than in the money- or exchange rate-targeted countries).

A significant number of papers have been published on the impact of the Federal Reserve System's monetary policy on the inflation.

Taylor (1993): the article describes a Federal Reserve System's approach using the monetary policy rule which adjusts the short-term nominal interest rate in response to the inflation and output deviations.

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Taylor (2013): the author points to the need to consider more accurate today's models, since the USA's monetary policy has deviated from the well-known Taylor rule and the potential costs resulted from this deviation can be justified by international secondary effects.

Goodfriend (1991): interest rate smoothing operations facilitate the interaction between the Central Bank and market participants. The article mentions that the output and the prices do not respond to daily overnight rate fluctuations, but only to changes in the long-term interest rates.

Castelnuovo (2010): more and more studies show a strong link between the monetary policy and the (expected) inflation. The study examines the factors which determine the dynamics of inflation expectations in the USA and shows that the global indicators seem to have played a significant role until the mid-1980s, but later on they have been replaced by the US monetary policy factor.

Singh (2006) conducted a study on the impact of the monetary policy on the Indian inflation. He argued that the first stage of the financial sector reform was complete and that the macroeconomic indicators in terms of inflation and the interest rates were satisfactory and stable, as well as that the conditions allowed adopting the inflation targeting in India. Singh advocated for several issues to be addressed, namely the use of monetary instruments to control the inflation, the publication of a comprehensive report on the inflation, and the establishment of an Inflation Committee to ensure transparency of the work until the actual inflation targeting could have been adopted in India.

Analyzing the monetary policy of Japan, the authors made the following conclusions: Sims and Zha (2006): manipulation of the monetary base becomes the only possible option for the Bank of Japan as the interest rate approaches the zero bottom line. Its shocks seem to stimulate the economy, although they are not strong enough to cause inflationary pressure.

Okimoto (2019): the results showed that the devaluation of the Japanese yen resulted from the inflation targeting policies introduced by the Bank of Japan and played an important role in the significant inflation growth in 2013.

A number of researchers analyze the impact of the Chinese monetary policy on the inflation.

Fan et al. (2011): the authors study the response of the Chinese monetary policy in terms of the money supply and the interest rates to the economic conditions and the effectiveness of these policies in achieving the goals to stimulate the economic growth and control the inflation. The quarterly results for 1992-2009 show that the money supply rule has some impact on future inflation and the real production output, but the interest rate rule does not affect the expected inflation and the real output.

Koch (2007): despite significant changes in the Chinese monetary policy over the past two decades, loan granting has always played a crucial role, and the PBC has increasingly relied on interest rates to achieve its policy goals in the recent years.

Liu (2018): the interest rate has been a key monetary policy issue. At the same time, this issue has become very complex and relevant for the Chinese decision-makers regarding the country's economy in the shadow of the China-US trade war. The study shows that macroeconomic conditions affect credit rates.

When studying the impact of the monetary policy on the South African inflation, the authors noted a number of opinions.

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Woglom (2005): when discussing how the inflation targeting introduced in 2000 impacted the monetary policy in South Africa, the researcher points out that South African Reserve Bank's response to the changed real value of its currency has not been transparent and, therefore, is a source of confusion.

Taylor (2001): exchange rate stabilization can help stabilize production and reduce the inflation to the target level. When financial markets are poorly developed, for example, in case of emerging markets, Central Banks play a crucial role in managing the economic agents' expectations.

The studies related to the interaction between monetary policies and inflation expectations arouse interest. For example, Gobbi et al. (2018) suggest that the agents form expectations in terms of a probabilistic belief that the economy can go from normal to depressed. The authors make two conclusions. First, when facing shocks, if the inflation expectations "fall faster" than the political rate and the zero limit is reached without any adjustment of the impact, the system enters a new stable state – the "new normal", with constant negative gaps. Second, a more aggressive monetary policy is ineffective both at the zero lower limit and above it when the impact is large and/or when the inflation expectations are rather high.

Buono and Formai (2018) have explored the scope of pegging of the inflation expectations are in the advanced economies and found that, following the financial crisis, the expectations were firmly pegged to the goals in the USA and, to a lesser extent, in the United Kingdom. In the euro zone, the expectations were cancelled soon after the crisis and again, starting from 2014. In Japan, the removal of pegging has been more common throughout the entire sampling period.

3. Study methods

To determine which monetary policy instruments influence the macroeconomic indicators, the following approach is applied.

Essentially, it is a correlation analysis method.

Here are the critical remarks of the known approaches.

In the works given in the References, in order to prove the influence of the MP instruments on the macroeconomic indicators, the authors usually use an economic approach.

This means plotting the function

$$Y=f(X, z_1, z_2,...z_n),$$

where Y – the studied macroeconomic indicator, X – the monetary policy instrument considered as controlling parameter, z_1, z_2,..., z_n – a set of factors allowing an accurate forecast of Y.

In case of successful modeling, the authors point out the presence of dependence of Y on the controlling variable X under conditions determined by the values of z_1, z_2, ..., z_n.

However, the presence of factors z_1, z_2, ..., z_n indicates that the variable X may not be a controlling factor. Let's say that the variable X is a control factor, if its changes in some direction leads to a change in the controlled parameter in the previously defined direction.

The Corr function is calculated as

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$$Corr(\{x_t, x_{t+1/12}, x_{t+2/12}, ..., x_{t+\Delta}\},\{y_{t+s}, y_t+_{1/12+s}, y_{t+2/12+s}, ..., y_{t+\Delta+s}\})=$$
$$=Cov(X_\Delta(t),Y_{\Delta,s}(t))/(VarX_\Delta(t)\cdot VarY_{\Delta,s}(t)))^{-1/2}$$
$$Cov(X_\Delta(t),Y_{\Delta,s}(t))=(x_t\cdot y_{t+s}+x_{t+1/12}\cdot y_{t+1/12}+...+x_{t+\Delta}\cdot y_{t+\Delta+s})/(12\Delta)-EX_\Delta(t)\cdot EV_{\Delta,s}(t),$$
$$VarX_\Delta(t)=((x_t-EX_\Delta(t))^2+(x_{t+1/12}-EX_\Delta(t))^2+...+(x_{t+\Delta}-EX_\Delta(t))^2)/(12\Delta-1),$$
$$VarY_{\Delta,s}(t)=((y_{t+s}-EY_{\Delta,s}(t))^2+(y_{t+1/12+s}-EY_{\Delta,s}(t))^2+...+(y_{t+\Delta+s}-EY_{\Delta,s}(t))^2)/(12\Delta-1)$$
$$EX_\Delta(t)=(x_t+x_{t+1/12}+...+x_{t+\Delta})/(12\Delta),$$
$$EY_{\Delta,s}(t)=(y_{t+s}+y_{t+1/12+s}+...+y_{t+\Delta+s})/(12\Delta)$$

Interpretation of the results is preceded by the selection of the function, corresponding most to the reality, depending on a time lag, i.e. the time of delay of the MP instrument impact on the macroeconomic indicator. It is logical to consider the values of s equal to 0, 1, ..., 12. The selected range of three years covers 36 values of time moments, when the functions F=F(t, 3, s), s = 0, 1, ..., 12 are calculated. At these moments, the maximum s value is compared to 13, the rest – to 0. Comparison of the sums of these values at fixed s for different s gives us the most adequate time lag. (If there are several lags with equal sums, we carry out a similar procedure for these lags, but compare the elements following after the maximum ones, etc.). Thus, the function F=F(t, 3, s) determines the best estimation of the impact of the factor X on the factor Y, taking into account the time lag, as well as the impact character within $\Delta = 3$ years (the longer period leads to dilution – the correlations values become essentially smaller in absolute values, than at $\Delta =3$; at smaller values of Δ the function often becomes oscillating, i.e. essentially depending on insignificant (in terms of economy) perturbations).

When interpreting the F function, it should be noted that if the F values are within the ranges close to the values of +1 or -1, the studied macroeconomic indicator changes, though the control indicator does not change. It does not indicate the evidence that this MP indicator is management.

On the other hand, if changes in the MP indicator does not result in changes of the trend of the macroeconomic indicator, and the F values are within the ranges close to the values of +1 or -1, we believe that the conclusion on "manageability" is not correct, as well.

Plotting of the dependencies lead to the following results.

The presence of dependence is determined by the proved, if the plotted correlation chart F=F(t, Δ, s) lies close to one or minus one, and the functions are not constant within the corresponding intervals on the MP instrument charts and the indicator chart.

Following the rules of regression analysis, we can determine the impact as positive (the growth of the value X results in the growth of the value Y, while the decrease of the value X leads to the decrease of the value Y), or negative (the growth of the value X simulates the decrease of the value Y, the decrease of the value X results in the growth of the value Y).

The situation when the chart F oscillates with a high amplitude in the band containing both the set in the negative and in the positive semi-plane is indisputably interpreted. In this case, the variable X is not a controlling variable. Oscillation means that management can lead to both expected and unexpected results.

The chart which at some values of $t < T_0$ lies close 1, and at $t > T_0$ – close to -1 can be interpreted as being manageable in one way at $t < T_0$, being manageable in a completely different way at $t > T_0$. (This is also true if the chart moves from Y<0 to Y>0).

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If the chart lies close to 0, the values do not correlate, the management is not observable or significant.

The preliminary data analysis was carried out according to the following plan.

At the initial stage, further analysis was allowed for the countries with the absolute value of the correlation between the refinancing rate and the inflationary processes indications equal to at least 0.4 within the period from January 2000 to December 2017. The financial systems of Australia (1), India (2), New Zealand (3), Norway (4), USA (5), China (6), and South Africa (7) were selected.

At the following stage, the below-mentioned functions were plotted for each country

$$F_i=F_i\,(t,3,s),$$

where i=1,...,7 – the country's number, s=0, 1/12, 2/12, ...12/12 – the monthly lag, t – the time points by month, from January 2000 to December 2014, plus the months of the time lag, determined by the value s.

According to the rule given above, the most significant time lag was selected for each country, s_i. The obtained dependence was analyzed.

4. Source data

The following sources were used for the analysis:
The official websites of the US Federal Reserve System, the Reserve Bank of New Zealand, the Reserve Bank of India, the Reserve Bank of South Africa, the Bank of Norway, the Reserve Bank of Australia, the People's Bank of China;
Thomson Reuters Database (Countrycard: economics);
Thomson Reuters Database (Datastream);
The website of the International Monetary Fund.

The data were selected from January 1, 2000, to December 31, 2017. The frequency of data – monthly data. Missed data were completed by repeating the previous value in time.

5. Findings

The type of the identified dependencies with interpretation of the results is specified in Table 1.

Table 1. Interpretation of the charts

Title	Lag si	Interpretation
Fig. 1. Key rate correlation (%) with a GDP deflator (%) in South Africa	4	There are three waves of oscillation, and from June, 2002 to October, 2005 the relationship is steadily negative. The management character significantly depends on additional conditions. The rate cannot be used as the only management parameter
Fig. 2. Base rate correlation (%) with CPI (%) in New Zealand	3	There are two waves of oscillation, and from June, 2007 to December, 2010 the

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		relationship is steadily positive. From July, 2007 to October, 2010 the relationship is unsteadily negative. The management character significantly depends on additional conditions. The rate cannot be used as the only management parameter
Fig. 3. FRS rate correlation (%) with CPI (%) in the USA	3	There are two waves of oscillation. From July, 2002 to May, 2005, the relationship is steadily positive, while from December, 2005 to June, 2012 it is negative. Obviously, the external environment determines the impact character. The rate cannot be used as the only management parameter
Fig. 4. Refinancing rate correlation (%) with CPI (%) in Norway	5	There are two periods – positive dependence from September, 2003 to May, 2006; from this moment to 2014 the dependence is negative with significant disturbances (deviation from the trend) in May, 2009. The rate cannot be used as the only management parameter. The dependence character is similar the indicator for Australia
Fig. 5. Key rate correlation (%) with CPI (%) in Australia	5	There are two periods – positive dependence from June, 2001 to December, 2005; from this moment to 2014 the dependence is negative with significant disturbances (deviation from the trend) in May, 2009. The rate cannot be used as the only management parameter. The dependence character is similar the indicator for Norway
Fig. 6. Discount rate correlation (%) with CPI (%) in India	4	In addition to the pre-crisis time interval from February, 2003 to May, 2007, the dependence is steadily negative. The rate is may be used, taking into account the external environment
Fig. 7. Refinancing rate correlation (%) with CPI (%) in China	2	Except for the “positive” period from September, 2004 to May, 2008, the dependence is oscillating that doesn't allow using the rate as a management instrument.

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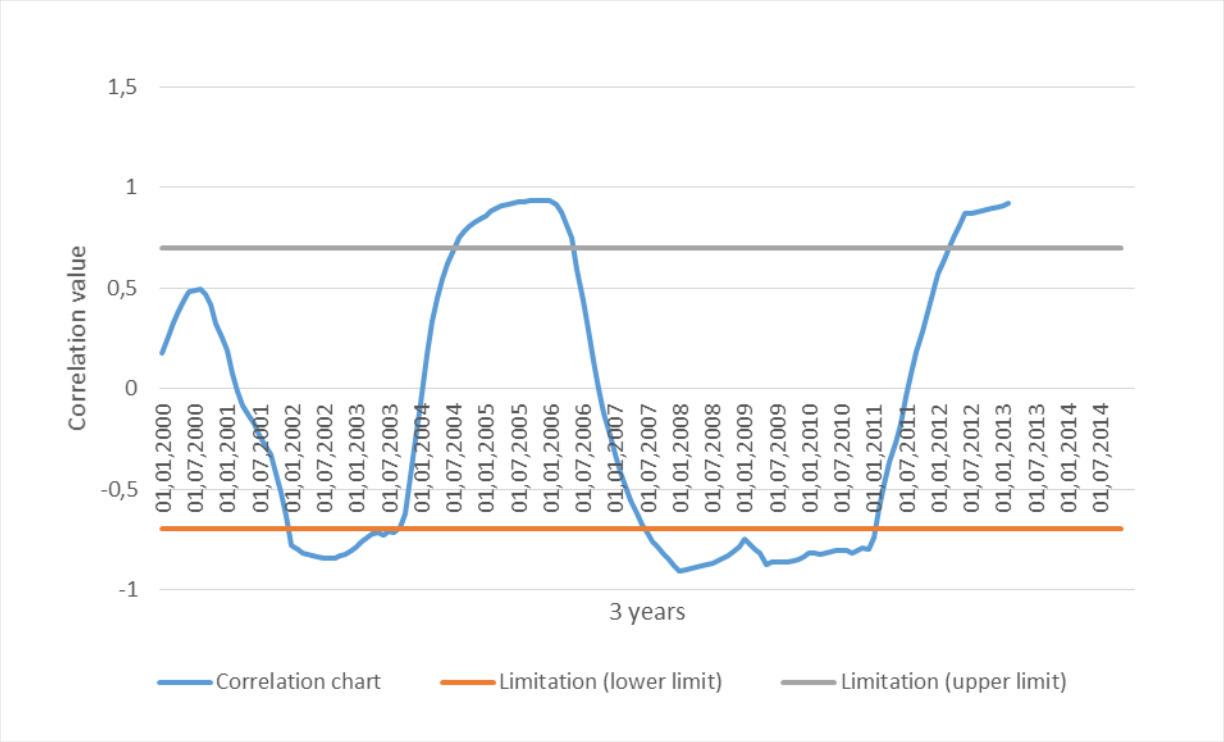

Fig. 1. Key rate correlation (%) with a GDP deflator (%) in South Africa

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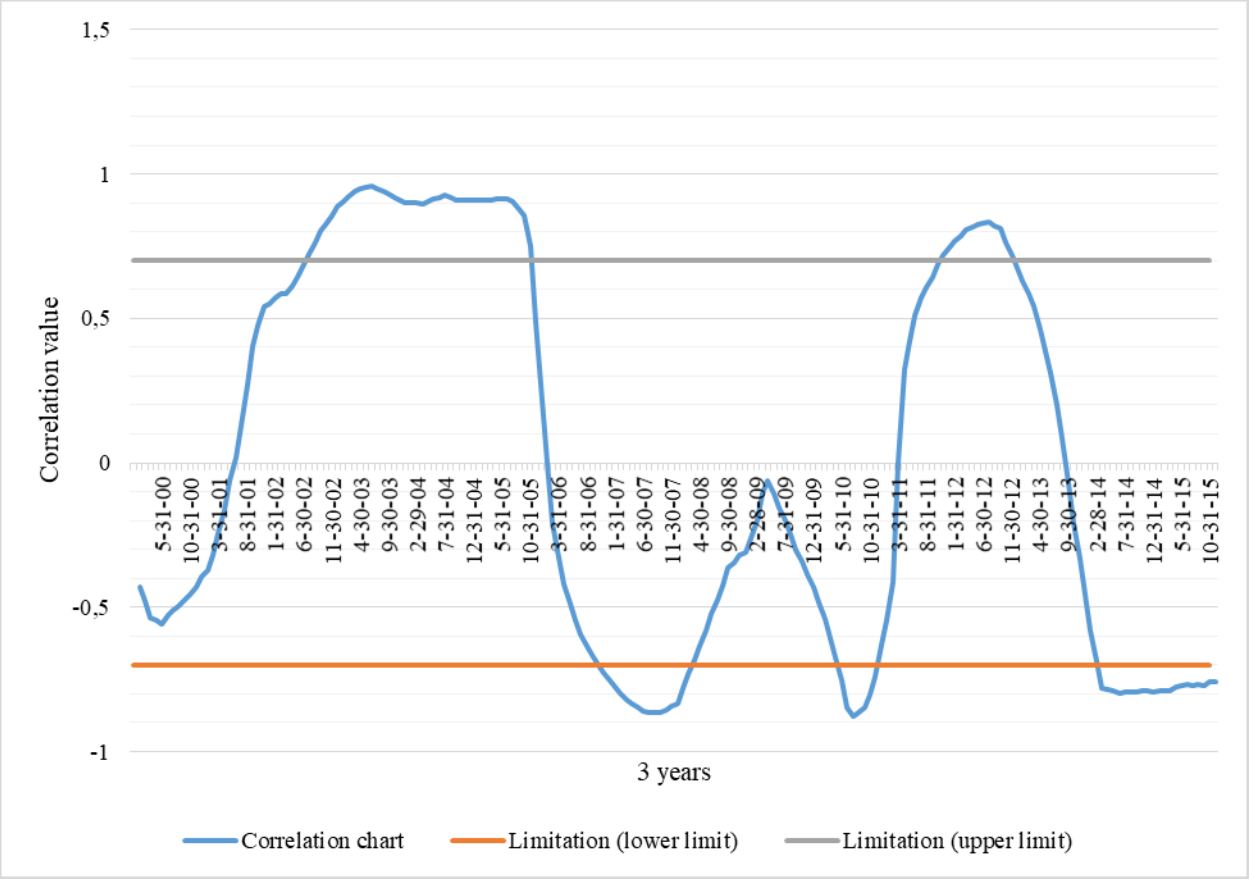

Fig. 2. Base rate correlation (%) with CPI (%) in New Zealand

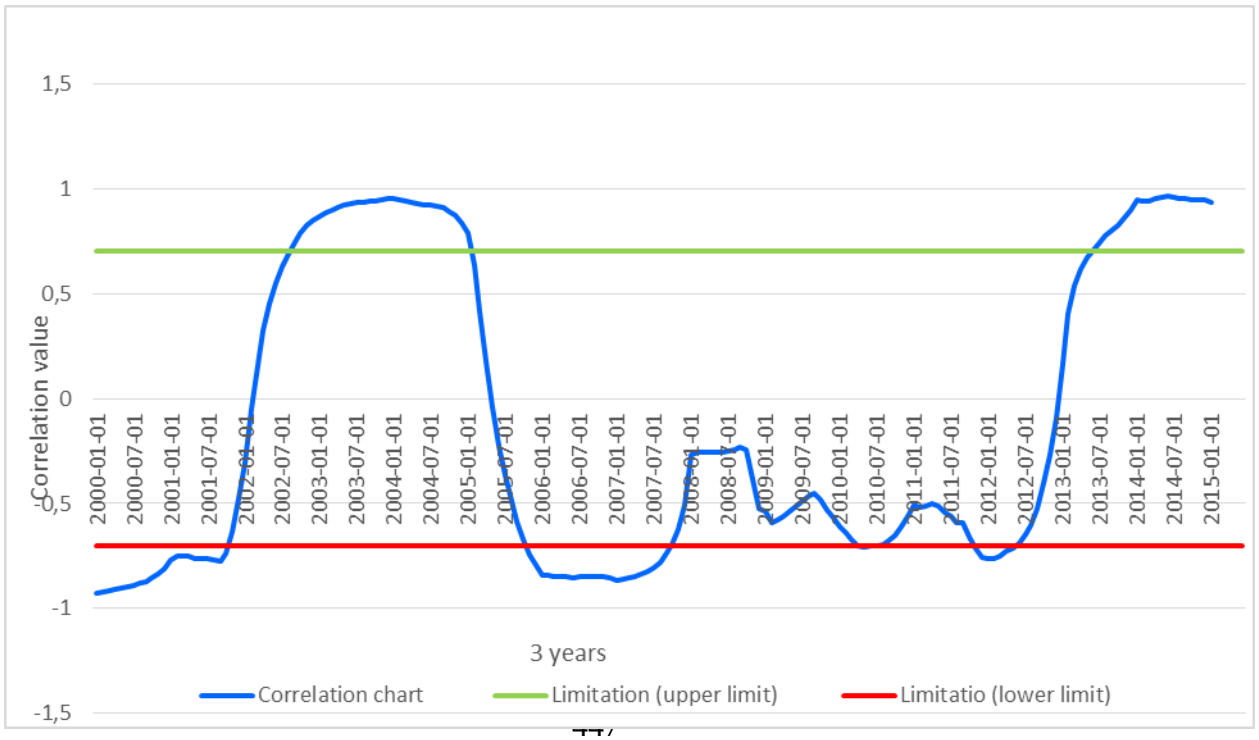

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Fig. 3. FRS rate correlation (%) with CPI (%) in the USA

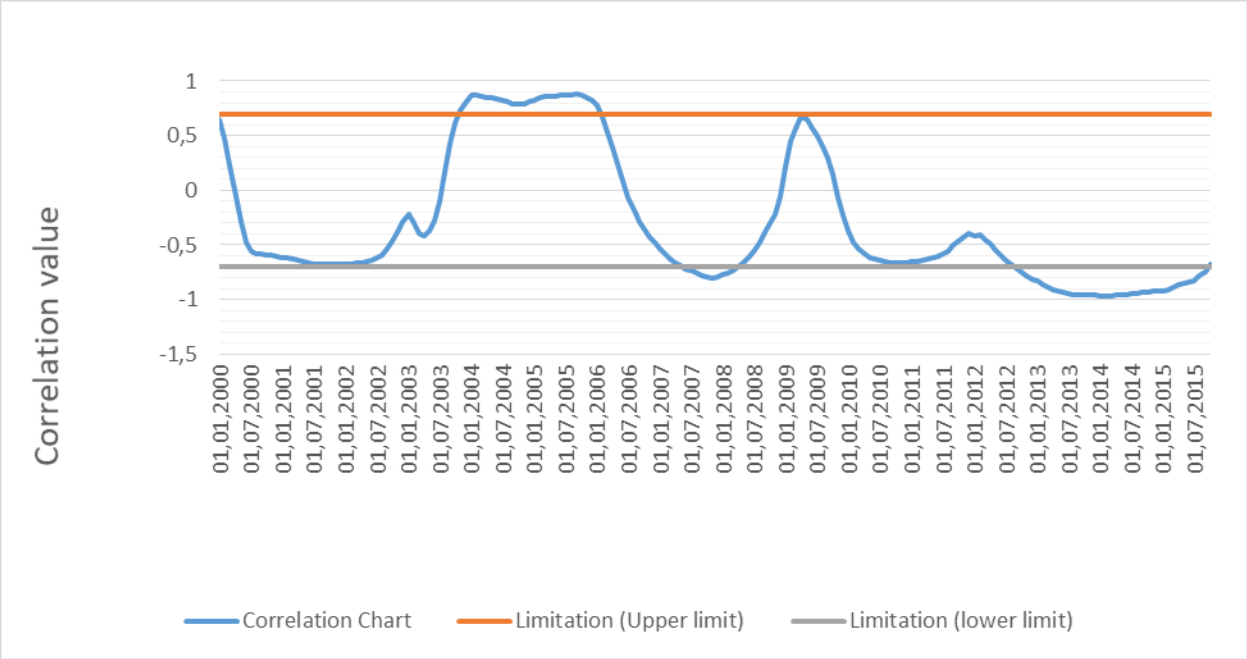

Fig. 4. Refinancing rate correlation (%) with CPI (%) in Norway

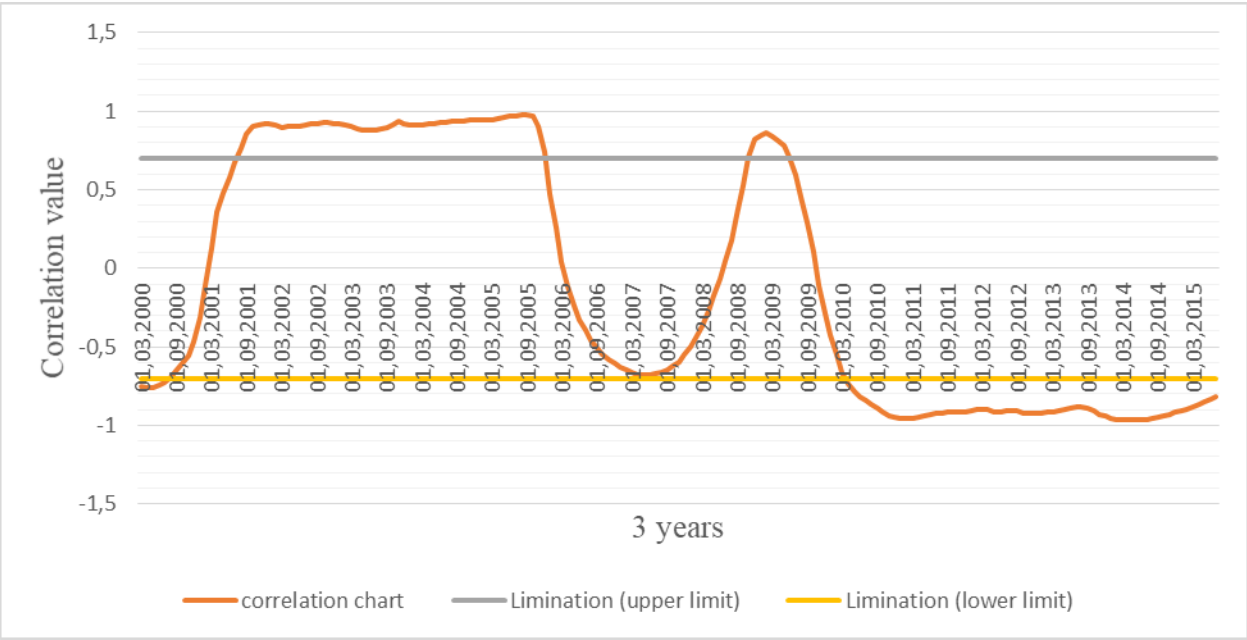

Fig. 5. Key rate correlation (%) with CPI (%) in Australia

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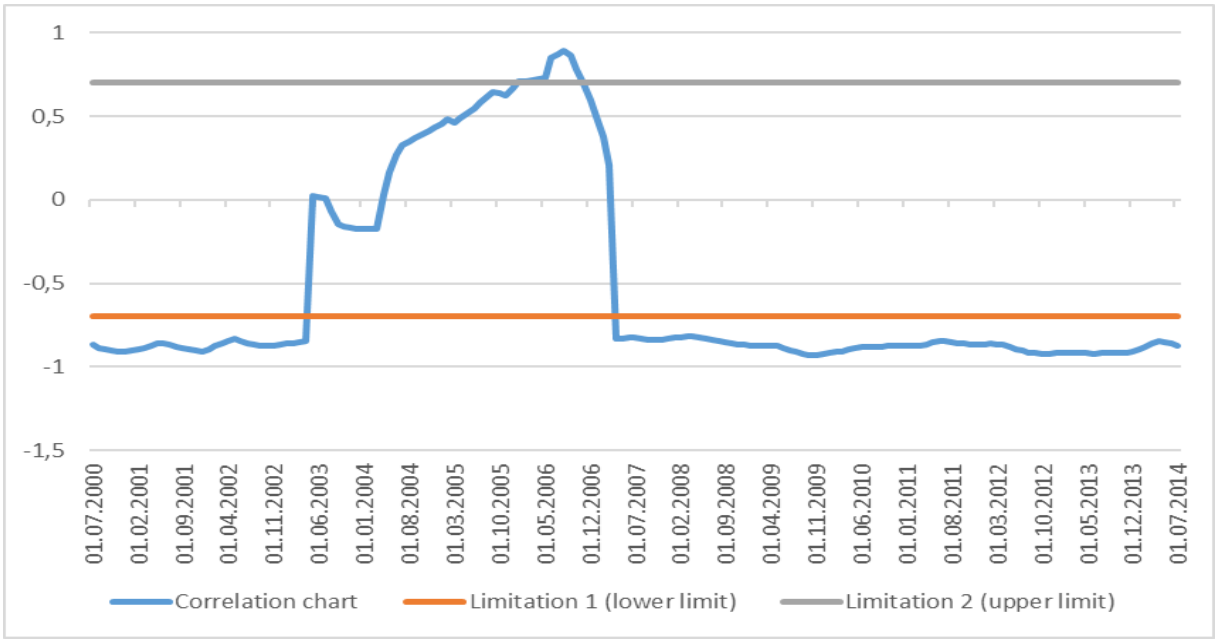

Fig. 6. Discount rate correlation (%) with CPI (%) in India

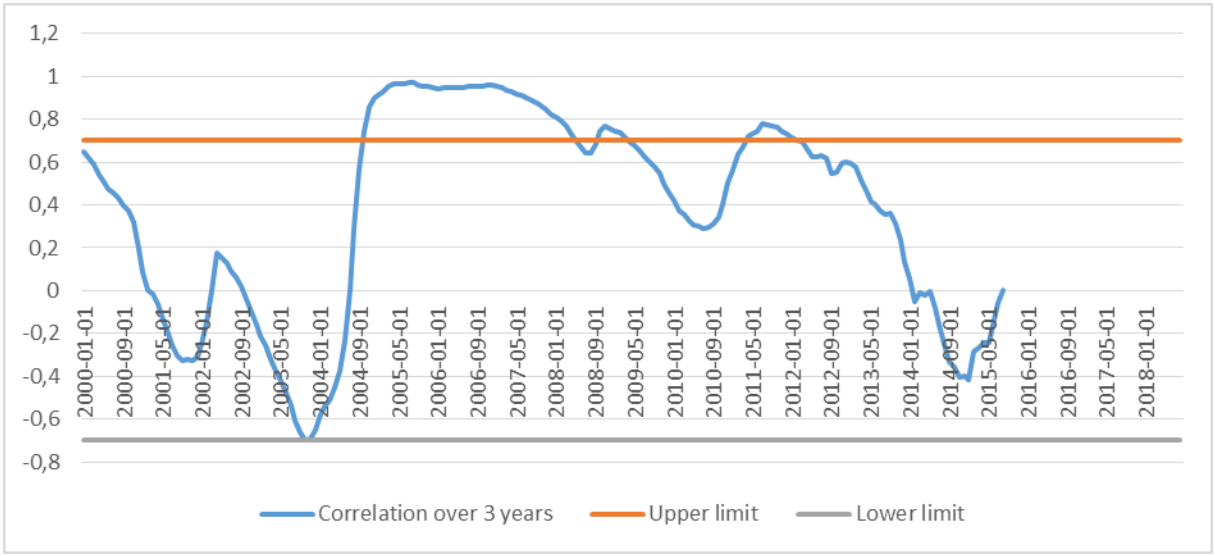

Fig. 7. Refinancing rate correlation (%) with CPI (%) in China

In the periods of economic development there is a high positive relationship between the rate and the CPI, since the Reserve Bank of New Zealand gradually increased the lending rate in order to contain the inflation, due to the increase in the consumer prices index accompanying the economic growth.

The characteristics of the refinancing rate and the inflation in Norway, South Africa and New Zealand are quite similar, indicating some typology of possible management.

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Turning to the Norwegian experience, Kondratov (2012) points out that: "Inflation targeting is the basis for ensuring stable prices; regulation of the monetary sphere is flexible, it is carried out based on the international experience and specifics of the existing transmission mechanism".

In the USA, the FRS rate had a strong direct correlation with the CPI, as well as with the inflation rate from July, 2002 to May, 2005. This is due to the fact that, until then, there has been a dramatic decline in the growth rate compared to the previous year and they were out of control of the monetary policy, and the Federal Reserve System regulates the rate to change the economic situation in the country. There has also been a strong dependence on the CPI and the inflation rate since the beginning of 2013 until now.

Goodfriend (1991) believes that: "The interest rate smoothing operations facilitate the interaction between the Central Bank and market participants. The article mentions that the output and the prices do not respond to daily fluctuations of the overnight rate, but only to changes in the long-term interest rates".

In Australia, the inverse relationship between the key rate and the CPI results from the same law, as in the case of the GDP, i.e. a decrease in the money inflow into the economy due to increased key rates.

The periods from 2000 to 2003 and from 2007 to 2014 in India are characterized by a high negative correlation due to the fact that under conditions of economic slowdown, the refinancing rate increases, which leads to a decrease in the CPI.

It is possible to confirm what Singh (2006) states: "The first stage of the financial sector reform was complete and that the macroeconomic indicators in terms of inflation and the interest rates were satisfactory and stable, as well as that the conditions allowed adopting the inflation targeting in India. Singh advocated for several issues to be addressed, namely the use of monetary instruments to control the inflation, the publication of a comprehensive report on the inflation, and the establishment of an Inflation Committee to ensure transparency of the work until the actual inflation targeting could have been adopted in India".

Since the Chinese money supply grew from 14% in 2000 to 20% in 2003, the period of 2000-2003, the industrial production growth rates recovered up to 16.2% in 2003, and the consumer price index began to grow steadily, which can be seen in the chart – the correlation level has significantly increased.

Conclusions

The study revealed a twofold dependence between the changes in the inflation and the changes in the refinancing rate.

Three types of impact were identified.

The first type (USA, New Zealand, Norway, South Africa, Australia) is characterized by two stages of impact. The first, pre-crisis included positive influence, the rate growth determined the inflation growth; the second stage, starting from about 2006 – a negative dependence. If in the USA and South Africa the dependence was stable during this period of time, and since 2012 it has become positive again, New Zealand, Norway, and Australia are characterized by the disturbances of 2009 with a stable negative dependence up to 2014 (2017, as a 3-year period is considered).

India is the second type. It is characterized by a stage of positive influence in the pre-crisis period and further stable negative relationship, not subject to disturbances.

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An unpredictable Chinese indication is the third type. At the same time, China has been selected, and it may mislead the study, which is conducted without taking into account the dynamics of changes in the correlation.

The refinancing rate responds to the inflation with different lags.

Tightening of the monetary policy gives effect as a reduction of inflation only if this instrument is used after the stabilization period. In case of frequent application within a short period of time, the consequences may be unpredictable.

There is a feedback at some time intervals: the growth of the refinancing rate outpaces the inflation, i.e. leads to the inflation growth.

The inflation expectations, as a powerful factor of the price growth, arouse from the production and the sale of goods. As a consequence, it limits the role of monetary methods of the inflation management.

Under conditions of the financial and economic crises of 2008-2009, during the recession, and then the decline in prices (deflation), the Central Banks of a number of countries lowered the refinancing rate. The consequences were not obvious.

The method presented by the authors is new. It allows studying not the dependence of factors, as in the econometric studies, determining the quality of management of the MP instruments of the values, which are significant macroeconomic characteristics, set as targets.

The limitations of the method are that only variations of one MP instrument are considered as management. The authors will demonstrate the results of the analysis of the possibility to manage several MP instruments with key macroeconomic factors in the following papers.

References

Alvarez, L. J.; Sanchez, I. 2018. Inflation projections for monetary policy decision making, *Journal of Policy Modeling*. https://doi.org/10.1016/j.jpolmod.2018.09.005

Barnett, W. A.; Wang, C.; Wang, X.; Wu, L. 2019. What inflation measure should a currency union target?, *Journal of Macroeconomics* 59(C): 123-139. http://dx.doi.org/10.1016/j.jmacro.2018.11.006

Bayar, O. 2018. Weak instruments and estimated monetary policy rules, *Journal of Macroeconomics* 58(C): 308-317. http://dx.doi.org/10.1016/j.jmacro.2018.10.004

Buono, I.; Formai, S. 2018. New evidence on the evolution of the anchoring of inflation expectations, *Journal of Macroeconomics* 57(C): 39-54. http://dx.doi.org/10.1016/j.jmacro.2018.04.003

Caporale, G. M.; Carcel, H.; Gil-Alana, L. 2017. Central bank policy rates: Are they cointegrated?, *International Economics* 152: 116-123. https://doi.org/10.1016/j.inteco.2017.06.001

Castelnuovo, E. 2010. Tracking U.S. inflation expectations with domestic and global indicators, *Journal of International Money and Finance* 29(7): 1340-1356. https://doi.org/10.1016/j.jimonfin.2010.03.006

Fan, L.; Yu, Y; Zhang C. 2011. An empirical evaluation of China's monetary policies, *Journal of Macroeconomics* 33(2): 358-371. https://doi.org/10.1016/j.jmacro.2010.11.003

Fatas, A.; Mihov, I.; Rose, A. K. 2006. Quantitative goals for monetary policy. National Bureau of Economic Research Working Paper No. 10846. Retrieved from https://www.nber.org/papers/w10846

Gobbi, L.; Mazzocchi, R.; Tamborin, R. 2018. Monetary policy, de-anchoring of inflation expectations, and the "new normal", *Journal of Macroeconomics*. https://doi.org/10.1016/j.jmacro.2018.10.006

Goodfriend, M. 1991. Interest rates and the conduct of monetary policy, *Carnegie–Rochester Conference Series on Public Policy* 34: 7-30. https://doi.org/10.1016/0167-2231(91)90002-M

Horvath, R.; Kotlebova, J.; Siranova, M. 2018. Interest rate pass-through in the euro area: Financial fragmentation, balance sheet policies and negative rates, *Journal of Financial Stability* 36: 12-21. https://doi.org/10.1016/j.jfs.2018.02.003

Kashyap, A. K.; Stein, J. C. 1995. The impact of monetary policy on bank balance sheets, *Carnegie–Rochester Conference Series on Public Policy* 42: 151-195. https://doi.org/10.1016/0167-2231(95)00032-u

Koch, E. 2007. The monetary policy transmission mechanism in China, in *Challenges at the Bank for International Settlements*. Berlin: Springer, 321–327.

Kondratov, D. I. 2012. Actual aspects of monetary policy in Norway, *Forecast Issues* 1: 129-151.

Liu, K. 2018. Chinese manufacturing in the shadow of the China–US Trade War, *Economic Affairs* 38(3): 307-324. http://dx.doi.org/10.1111/ecaf.12308

Nucera, F.; Lucas, A.; Schaumburg, J.; Schwaab, B. 2017. Do negative interest rates make bank less safe?, *Economics Letters* 159: 112-115. http://dx.doi.org/10.1016/j.econlet.2017.07.014

Okimoto, T. 2019. Trend inflation and monetary policy regimes in Japan, *Journal of International Money and Finance* 92: 137-152. http://dx.doi.org/10.1016/j.jimonfin.2018.12.008

Papadamou, S.; Sidiropoulos, M.; Spyromitros, E. 2015. Central bank transparency and the interest rate channel: Evidence from emerging economies, *Economic Modelling* 48: 167-174. http://dx.doi.org/10.1016/j.econmod.2014.10.016

Popescu, I. V. 2014. Analysis of the behavior of central banks in setting interest rates. The case of Central and Eastern European countries, *Procedia Economics and Finance* 15: 1113-1121. http://dx.doi.org/10.1016/s2212-5671(14)00565-6

Rubio, M. 2016. Short and long-term interest rates and the effectiveness of monetary and macroprudential policies, *Journal of Macroeconomics* 47: 103-115. http://dx.doi.org/10.1016/j.jmacro.2015.09.007

Sanfilippo-Azofra, S.; Torre-Olmo, B.; Cantero-Saiz, M. 2018. Financial development and the bank lending channel in developing countries, *Journal of Macroeconomics* 55: 215-234. http://dx.doi.org/10.1016/j.jmacro.2017.10.009

Sims, C.; Zha, T. 2006. Were there regime switches in US monetary policy?, *American Economic Review* 96(1): 54-81. http://dx.doi.org/10.1257/000282806776157678

Singh, C. 2006. *Inflation targeting in India.* Published by Indian Institute of Management.

Taylor, J. B. 1993. Discretion versus policy rules in practice, *Carnegie-Rochester Series on Public Policy* 39: 195-214. http://dx.doi.org/10.1016/0167-2231(93)90009-l

Taylor, J. B. 2001. The role of the exchange rate in monetary policy rules, *American Economic Review* 91(2): 263-267. http://dx.doi.org/10.1257/aer.91.2.263

Taylor, J. B. 2013. International monetary policy coordination: Past, present and future. Bank for International Settlements Working Paper No. 437. Retrieved from https://www.bis.org/publ/work437.htm

Tvaronavičienė, M. 2018. Toward efficient policy making: forecasts of vulnerability to external global threats, *Journal of Security and Sustainability Issues* 7(3): 591-600. https://doi.org/10.9770/jssi.2018.7.3(18)

Vasiljeva, M. 2017. The effect of dividend policy on company's market price per share, *Journal of Applied Economic Sciences* XII(4(50)): 995-1007. Retrieved from http://cesmaa.org/Docs/JAES%20Summer%20XII%204(50)2017_online.pdf

Woglom, G. 2005. How has inflation targeting affected monetary policy in South Africa?, *South African Journal of Economics* 71(2): 198-210. http://dx.doi.org/10.1111/j.1813-6982.2003.tb01314.x

Wulandari, R. 2012. Do credit channel and interest rate channel play important role in monetary transmission mechanism in Indonesia? A structural vector autoregression model, *Procedia - Social Behavioral Sciences* 65: 557-563. http://dx.doi.org/10.1016/j.sbspro.2012.11.165

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CITY: ECONOMIC GROWTH AND SOCIAL ATTRACTIVENESS ISSUES*

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Abstract. Background/Objectives: the city has always been seen as a place for productive forces. Therefore, it attracts investments and skilled personnel. The concentration of various enterprises on a relatively small area helps reducing costs, which, in its turn, increases the interest of the business towards product development. At the same time, city growth causes a variety of acute social problems. The article presents the main concepts of city development and considers methods of evaluating its social and economic evolution. Methods: The article defines the concept of "sustainable city development", identifies the leading indicators of the city attractiveness and economic growth, and suggests an integrated attractiveness index of life in a city. The main steps of the analysis of the city development dynamics are considered. An econometric model is built, which reflects the dynamics of the gross municipal product, and relation is studied between the growth of the gross regional product and the leading social and economic indicators. Methods of correlation and regression analysis were used to rank the main factors of sustainable development. Findings: It is established that the most significant and decisive factor influencing the gross municipal product is not an economic but a social one with the capital investment efficiency being a minimum of three years. Applications/Improvements: To ensure the growth of the gross municipal product there should be a correlation between social and economic interests of the residents and regional enterprises, which is expressed first of all in the public socioeconomic policy. Areas of interaction between the main structural components of the city system have been identified.

Keywords: city development concept; econometric model; integral attractiveness index; "convolution" of indicators; sustainable development; growth of economic indicators

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JEL Classifications: R110; C010

Additional disciplines: ecology and environment

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1. Introduction

The city has always been viewed as a place of location of productive forces. Territorial proximity of companies and enterprises, concentration of various institutions in a relatively small area, availability of social and economic infrastructure plays its role in cost reduction which, in its turn, increases the interest of the business community in production development and, consequently, attracts investments and skilled personnel thus favoring the city growth and development. Evolution of cities increasingly turns them into the community center in all of its aspects (economy, politics, culture, science, etc.) and generates new problems becoming the subject of new researches and new approaches (Kazantsev, Svetunkov, 2004; Doolina, Kuznetsova, Lebedeva, Tokarev, 2004; Bikas, Saponaitė, 2018; Vinogradova, 2015; Takhumova et al., 2018).

At the same time, the growth of cities, in its turn, leads to accumulation of too many people in small areas and comes with increasing inconveniences which gives rise to multiple acute social issues related with economic disparity, crime (which is much harder to tackle in urban conditions), rising resource consumption, and urban pollution. Excessive increase in resource consumption results in the sophistication of traffic streams and rise in the cost of cargo transportation, increase in costs for development and maintenance of urban economy, and upset of necessary interrelations within the city structure (Shmankevich, 2005, Ufimtseva, 2014; Balynskaya, Ponomarev, 2018). However, is the growth of cities always reasonable?

2. Literature review

There are various concepts of growth and development of cities (Table 1).

Table 1. Main city development concepts

Key points	Characteristics
1 A concept of primary and non-primary city activities: city justifies its existence and development in case if it can provide for: – external functions: reproduction processes conditioned by social and territorial division of labor and aimed at the communication with the outside world; – internal functions: reproduction processes satisfying various needs of city-dwellers themselves and intra-urban needs (Raman, 2010)	A comprehensive approach to the development of cities taking into account economic and social aspects.
2 A concept of local communities: the city may function appropriately if a combination of production factors in this city provides for the income which is typical for such community and the corresponding level of satisfaction of the population needs (Karkavin, 2001).	Social development of the territory is of the highest priority.
3 A concept of sustainable development: combines the aims of stable and dynamic social and economic growth on the one hand and reliable natural, resource and environmental safety of development on the other hand (Krynychky, Bezrukov, Lavrentyev, 2015, Bogomolov, Mashencova, 2015).	System approach taking into account not only economic and social aspects but also the ecological aspect which includes limitations on the growth of large cities.
4 “Smart city” concept: city “incorporating the engineering infrastructure, IT-infrastructure, social infrastructure, and business infrastructure to use the collective mental capacity of the city." The city follows a “green growth” policy when the economic growth is accompanied by simultaneous reduction of emissions and greenhouse gas pollution, i.e. minimum losses caused by inefficient use of natural resources and loss of biodiversity (Estevez, Vasco, Janowski, 2017; Harrison, Donnelly, 2011; Caragliu, Del Bo Ch. and Nijkamp, 2011; Komninos, 2015; Lazaroiu, Roscia, 2012; Lombardi, Giordano, Farouh, Wael, 2012; Pierce P., Andersson B., 2017; Sikora-Fernandez, 2013; Gandini, A., Garmendia, L., San Mateos, R. ,2017; García-Fuentes, M. A., de Torre, C., 2017; Oates, M., Melia, A., Ferrando, V., 2017; Daher, E., Kubicki, S., Guerriero, A., 2017).	Environmental pressure release, extensive use of innovations; “smart city” structure is heterogeneous, its basis – developed urban infrastructure. The digital environment binds structural components.

Source: compiled by the authors

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Despite the differences and specific features of each concept, yet they have one thing in common: the city should be comfortable for its residents and attractive for the business.

The city dynamics and sustainable development are the critical factors of the economic growth of the region and the entire country (Vining, 1982; McFarlane, 2010; Ufimtseva, Minaev, Volchkova, Merkuleva, 2015; Rakhimova, 2014). The sustainable city development is understood as a growth of economic indicators, improvement of life quality of city residents (increase in social indicators) and increase in these indicators as compared with the previous period, i.e., monitoring of changes.

Current methods of assessment of the city socioeconomic development are given in Table 2. Now we analyze the results of researches of sustainable development of the urban economy in works of Russian academic economists

Table 2. Econometric models used to investigate the sustainable development of the city economy

Author, source, city	Findings	Advantages of the method
Bogomolova I.V., Mashentsova L.S., (2015), Volgograd	Qualitative factors of the city sustainable development are transformed into quantitative indicators: city functionality; relation of salary towards the minimum of subsistence; retail and public catering turnover per capita concerning the minimum of subsistence; life expectancy; the number of officially registered unemployed. Each factor is assigned with its weight and has its scale of indicators, which is identified based on socioeconomic and statistical studies.	Assessment of factors of socioeconomic development is objective; indicators measurement is easy and inexpensive. The method can be used for any city and to compare different cities.
Khabibrakhma-nova R.R., (2011), Kazan	Developed econometric models, showing how the gross municipal product (GMP) volumes and GMP per head of urban population, depend on the change of various factors: industrial product output, investment in fixed capital, and retail turnover. Elasticity coefficients have been calculated to determine the degree of sensitivity of GMP volumes and GMP per head of population to their change.	Using this method, it is possible to identify scenarios of the city economic development and substantiate projected and analytical indicators of its development; it is possible to identify conditions required to achieve the strategic goals of the city development.
Manaeva I.V., Rastvortseva S.N., (2016), single-industry towns in the Central Federal District of Russia	Developed models showing the influence of endogenous and exogenous factors on economic and social conditions of a single-industry town: industrial output is chosen as a resulting indicator of the economic status, and local budget revenue per capita – as a resulting indicator of the social status. Model components: the proportion of the population involved in the enterprise; population involved in the town economy; investment in the town budget; density of public hard-top motor roads in a single-industry town; distance to Moscow along motor roads; export and import quotas; population increase rate; and gross regional product per capita. Natural logthm values of all indicators are used.	Powerful prognostic capabilities
Belova T.A., Bakhitova R.Kh., Lakman I.A., (2016), Ufa	Production function has been made based on panel data for urban economy sectors: industrial production, construction, wholesale and retail trade, transport, and communications.	Interrelations between the leading macroeconomic indicators have been taken into account; it is possible to make their short-term forecasting and find out competitive strengths and problems of functioning of the metropolis economic system.

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Author, source, city	Findings	Advantages of the method
Krinichansky K.V., Bezrukov A.V., Lavrentyev A.S., (2015), towns of Chelyabinsk region	The assessed dependency of the gross municipal product (calculated using a factorial method) on the municipal spending on education and free medical care, the proportion of the population involved in small business, and investment in fixed capital.	For the largest cities, a significant positive relationship has been identified between the gross municipal product per capita and variables of spending on education, free medical care, and investment in fixed capital. Smaller towns strongly depend on the factor of social expenses.
E.S. Vakulenko (2012) The Cities of the Central Federal District (CFD) and Siberian Federal District (SFD)	$M_{i,t} = \sum_{k \in K} \beta_k X_{k,i,t-1} + \gamma_t + u_i + \varepsilon_{i,t}$ where $M_{i,t}$ – rate of migration growth in i-city in t-year (i.e. number of migrants arriving to the city minus persons leaving this city per 10,000 of residents); $X_{k,i,t-1}$ – explaining variables reflecting the characteristics of i-city in (t-1) year; β_k – vector of coefficients being evaluated at explaining variables, constant in time and similar for all cities; γ_t – temporal effect considered using a set of dummy variables for different years; u_i – individual effect of i-city including influence of unaccounted factors with their influence on the rate of migration growth in i-city being constant in time; $\varepsilon_{i,t}$ – random component, with correlation allowed for random components in observations for the same city.	While models with positive growth rate were adequate for CFD, SFD cities were characterized, vice versa, by negative migration balance. The average wage is the most critical decisive factor of migration to CFD cities. Wage size has a positive effect on the inflow of migrants to CFD cities and outflow of migrants from SFD cities. The rate of registered unemployment has a significant negative effect on migration to SFD. It was found that this variable has the most significant effect on migration coefficients compared with other factors used in the model. Inaccessibility of housing affects the rate of migration growth only for CFD major cities without account for Moscow and Moscow region. This factor is a barrier to migration to these cities.
Chen A., Coulson N. E. (2002)	$y_{i,t} = \alpha + \beta X_{i,t} + \mu_i + \varepsilon_{i,t}$ i – city, t – year μ_i – specific effect of i-city, $\varepsilon_{i,t}$ – error	The employment structure of a city has turned out to be the most crucial factor of urban migration. Cities with higher percentages of employment in industry and services sector and with a higher percentage of private business turn out to be more attractive for migrants. On the other hand, urban life quality indicators such as housing market and urban transport infrastructure factors do not affect migration.

Source: compiled by the authors

- Production functions have been made based on panel data for various urban economy sectors;

- The industrial output is chosen as a resulting value indicating the economic status, and the local government revenue per head of population - As the resulting value of social status (for the single-industry city economy) (Fomina, Berduygina, Shatsky, 2018);

- To measure the development level of a city such indicator as the gross municipal product (GMP) is being used and econometric models have been worked out to reflect the dependency of this indicator per head of the city population upon changes of various factors. Still, there is no established unified procedure of this indicator calculation, and it is not used in the Russian statistical records. The following main methods of this indicator calculation have been documented in the scientific literature (production method (income approach); expenses approach and factorial method; all of them have both strengths and weaknesses (Karkavin, 2011).

3. Research methods

Is the increase in the GMP always linked to the upward trend of economic indicators? In other words: does the GMP increase the influence on the city sustainable development?

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Analysis of the city development dynamic indicators is required for answering these questions.

We shall now consistently consider the main steps of such analysis.

First of all, we need to analyze trends in and evaluate the growth of a city population. In a general case, the process of city population number variation can be modeled as time series including both a trend and a seasonal component. Preliminarily, the time series is checked for exceptional values using the Irwin Criterion (Sadovnikova, Shmojlova, 2011), which is based on the determination of λ–statistics. The parameter λ=|Xi-Xi-1 |/σ, where σ is a mean square root deviation for the series under consideration, is calculated for a pair of neighboring observations. This parameter is compared with the respective critical value (Kobzar, 2006): if λ exceeds this critical value, there is an exceptional value, and the time series should be smoothed out. Anomalous values are smoothed, for instance, using the moving average method (WMA, Formula 1):

$$WMA_i = 0.25X_{i-1} + 0.5X_i + 0.25X_{i+1}. \quad (1)$$

As for short-term forecasting and evaluation of population growth, it is suggested to use the Holt-Winters adaptive model (Hyndman, Koehler, Ord, Snyder, 2008) which is a modification of the exponential smoothing method. The series' representation as a multiplicative combination of the linear trend with the seasonal component is used as the series' model.

Holt-Winters model-based forecast for p periods ahead is determined by expression (2):

$$\tilde{X}_{t+p} = (F_t + pC_t)M_{t+p-k} \quad (2)$$

Where k is the number of phases in a full seasonal cycle,

Xt – original time series, each element of which is a migration balance, i.e., the difference between the number of persons arriving in the city and the number of persons leaving the city during the same year.

The coefficients are updated as follows (Formula 3):

$$\begin{aligned} F_t &= \alpha_F \frac{X_t}{M_{t-k}} + (1-\alpha_F)(F_{t-1} + C_{t-1}) \\ C_t &= \alpha_C(F_t - F_{t-1}) + (1-\alpha_C)C_{t-1} \\ M_t &= \alpha_M \frac{X_t}{F_t} + (1-\alpha_M)M_{t-k} \end{aligned} \quad (3)$$

Where αF, αM, and αC are parameters of adaptation. Each parameter belongs to the interval [0;1], and the nearer a parameter is to one, the greater weight is ascribed to the latest observations.

The criterion for parameter selection is the minimization of the model's mean relative error.

Initial values of F0 and C0 are evaluated using the method of least squares (4):

$$Xt=F0+C0t+\varepsilon t \quad (4)$$

The forecast obtained using the model (3) allows for the identification of a population migration trend. Then, we should assess how attractive life is in a particular city and on which

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1. We suggest using an integral urban life attractiveness index. The leading indicators, given in Fig. 1, have been chosen for the calculation. Those indicators, growth of which improves the attractiveness of a city for its residents, are highlighted in the Figure.

Other indicators can also be included in the calculation. The main requirement is that they should consider the specific character of a particular city. On the one hand, they should reflect the economic, social, and ecological aspects of urban life. On the other hand, they are divided into negative (their increase reduces the attractiveness and quality of life) and positive (life quality is increased while they are increased) ones. All values should be preliminary rated to the interval [0;1] according to formulas:

$$X_{norm} = \frac{X - Xmin}{Xmax - Xmin} \quad \text{for positive indicators} \qquad (1)$$

$$X_{norm} = 1 - \frac{X - Xmin}{Xmax - Xmin} \quad \text{for negative indicators} \qquad (2)$$

The integral life attractiveness index is calculated as the arithmetical average of the rated values.

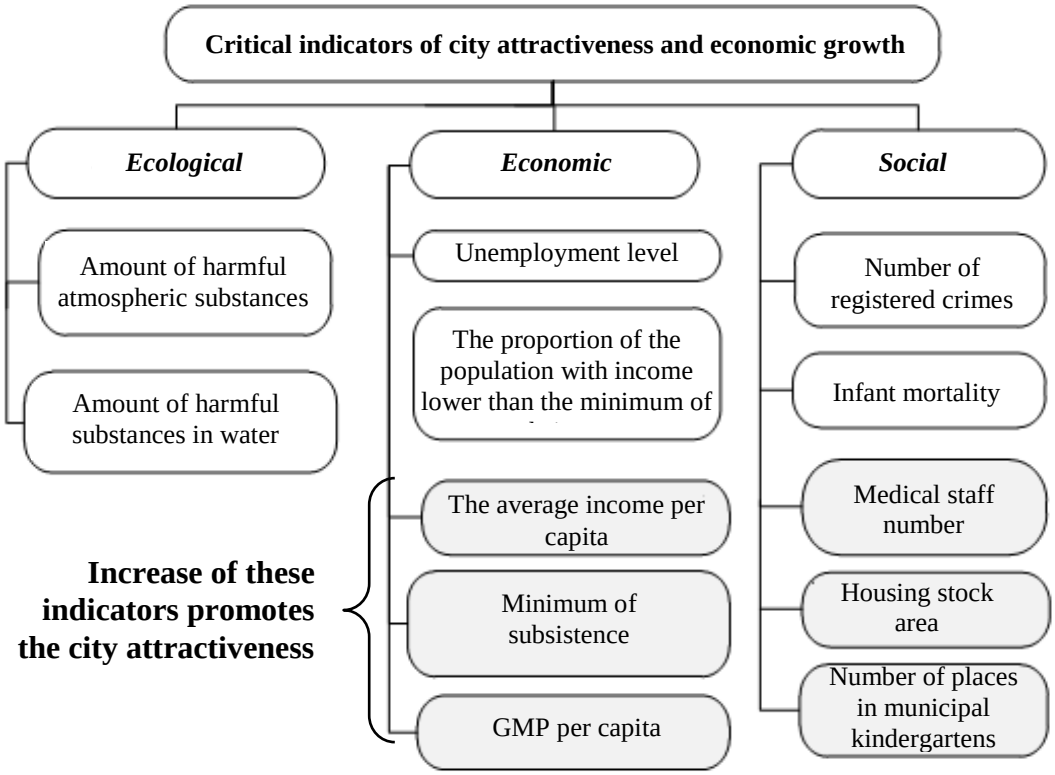

Fig.1. Indicators of city attractiveness and economic growth

It is convenient to use Harrington's desirability scale (Lyubushin, Brikach, 2014) to assess the attractiveness and quality of life; the scale reflects a relation between quantitative values of the non-dimensional index and human

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psychological perception (Table 3). Thus, the received integral index determined on the interval [0;1] acquires a subjective assessment of desirability. For a more comprehensive analysis of urban life attractiveness, the integral index should be considered in the dynamics.

Table 3. Harrington's scale value

Desirability	Desirability scale marks, non-dimensional value
Very bad	0.00-0.20
Bad	0.20-0.37
Satisfactory	0.37-0.63
Good	0.63-0.80
Very good	0.80-1.00

Source: Lyubushin, Brikach (2014)

2. Building a VMP time series – annual gross municipal product per capita. Series levels are calculated according to formula (3)

$$VMP = NC * VRP * m/NR \quad (3)$$

Where NC– number of city inhabitants; VRP – gross regional product; NR – the size of the region's population; $m = 1 + \Delta NC$, correction factor enabling to smooth violent fluctuations of the population size, ΔNC – annual rate of the city population growth.

3. Building ARIMA (Reiss, Wolak, 2007) model reflecting the GMP's dynamics and determining investment lags.

4. Identifying factors that form the GMP's tendency. We identify the following factors: economic, ecological, social, and exogenous (factors which may not be influenced at the municipal level). To analyze these factors, various indicators are required, which are calculated based on the available statistical records. Indicators may be grouped. Each group of indicators characterizes a particular aspect of the city development process. Indicators are grouped and represented in the form of the X-matrix. A minimum number of indicators is required for the analysis that reflect the reasons and expected impact of dynamic processes generated by the taken managerial decisions.

5. Transfer to the aggregates that characterize the economic and social aspects of the city life. Therefore, we use a method of "convolution" of indicators, which is described by us in detail (Oleinik, Zakharova, 2016).

We shall shortly mention here that "convolution" (quantity reduction) of indicators is performed by conversion to aggregate Zk, where k=1.2, which corresponds to the economic and social aspect. Each element of k-aggregate is calculated according to the following formula:

$$z_{ki} = \sum_{j=1}^{m_k} w_{kj} * x^{k}_{ij} / m_k \quad (4)$$

Where zki – the ith element of k-aggregate; mk – number of indicators in the group which is related to k-factor; xkij – the ith value of the jth indicator included in k-group; wkj – the weight of jth indicator in k-group which is calculated according to the formula (2)

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$$w_{k\,j} = R^{k}_{YXj} / \sum_{j=1}^{m_k} R^{k}_{YXj} \qquad (5)$$

Where Y– vector of GMP values for the selected period of record; RkYXj – correlation factor between jth indicator in group k (the corresponding column of the X-matrix) and the vector of GMP values.

6. Building multiple linear regressive models based on the aggregates (Eliseva, Kurysheva, 2008; Lager, Watson, 2010) comparative analysis of regression coefficients, and elasticity coefficients calculated based on the regression coefficients.

7. Selecting the most significant factor. Elasticity coefficients allow ranking the factors in order of importance of their influence on the GMP increase. The maximum coefficient of elasticity in absolute value will correspond to the most significant factor. The sign of both elasticity coefficient and the regression coefficient indicates what impact (positive or negative) the factor has.

8. Based on the obtained results, the municipal authorities take political decisions to increase the impact of positive factors and neutralize the impact of the main negative factors.

4. Results

The suggested approach was used to assess the sustainable development of the city of Vladivostok. The fact that Vladivostok was the largest city in the East of Russia, where the economy was undergoing intensification, and there was increasing economic interest from the countries of the Asia-Pacific region conditioned the choice. Fig. 2 shows the dynamic of arrivals and departures to/from Vladivostok. An annually increasing migration outflow was observed in 2002-2003, 2006 and 2010-2016. In absolute terms, the annual increase in this outflow was 765 persons on average. Each percentage point of absolute increase accounted for 123 persons. The highest increase rate was observed in 2011-2012 and accounted for 61.88% and 77.44% over the preceding period's outflow. The highest rate of inflow growth was observed in 2011 and accounted for 265.39% over the preceding period's inflow; its most significant reduction was registered in 2009 and 2010 – 17.55% and 19.13% over the preceding periods' figures, respectively. A sharp rise in the population number dynamic in 2011-2013 can be explained by the implementation of multiple governmental programs on the development of the Far East and significant investments in the region relating to the construction of major facilities on the eve of the 2012 APEC summit.

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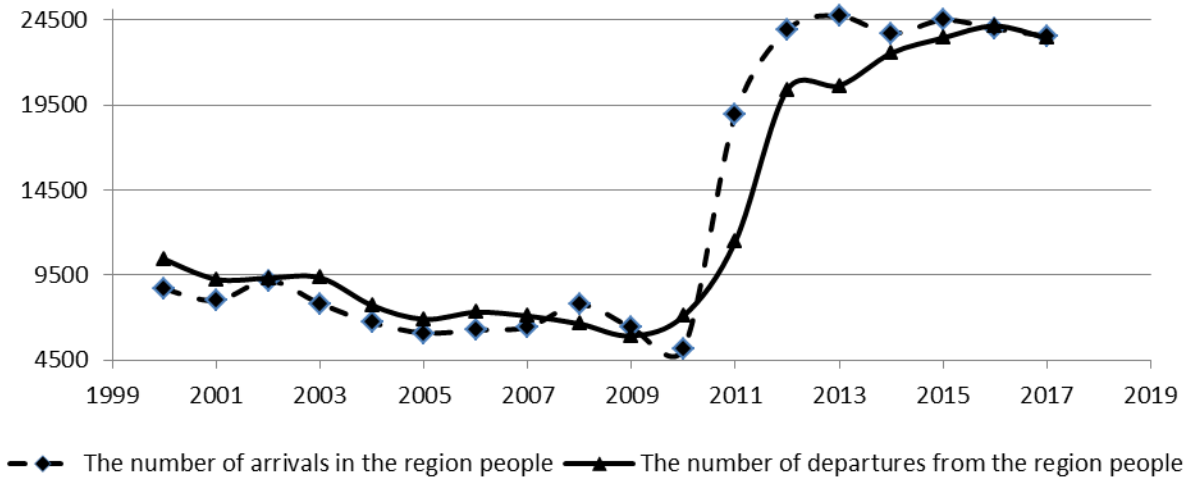

Fig. 2. Dynamic of arrivals and departures to/from Vladivostok in 2000-2017

The very fact of continuous migration outflow necessitates for analysis and forecasting of the migration situation in the city.

Let us use the Holt-Winters model to project population numbers and, in the beginning, calculate the migration balance, i.e., the difference between the number of persons annually arriving in and departing from Vladivostok during 2000-2017.

Annual migration balances for Vladivostok are input data for modeling. This time series contained two Irwin Criterion anomalous values in 2011-2012 which were smoothed out using Formula 1.

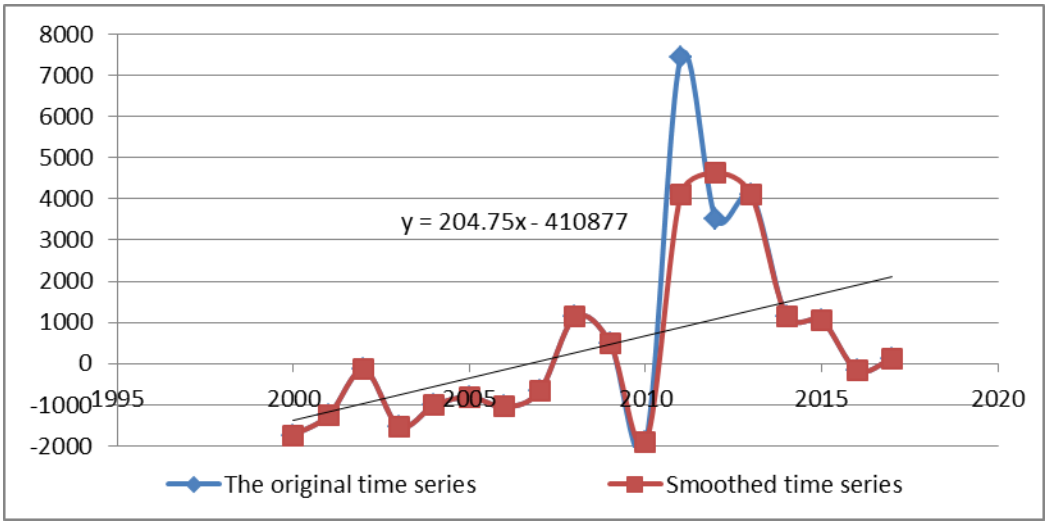

Fig. 3. Migration balance in Vladivostok during 2000-2017, persons

The graph above (Fig. 3) shows the equation of a trend line according to which mean annual growth of population is 205 persons.

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Table 4 presents calculations in accordance with adaptation parameters αF = 0.795; αM = 0.01; αC = 0.95 for migration balance forecasting in Vladivostok (Xt.). These calculations were performed using Formula (3). Adaptation parameters were obtained using the "Search for Solution" procedure in Excel. The search criterion was the minimization of mean relative error finalized at 0.025.

Table 4. Estimated values of the Holt-Winters model

Year	Xt	Ft	Ct	Mt	$\hat{X}_{t+p}$	Relative error
Original values F0 and C0		-1581,35	204,7503	1	–	–
2000	-1738	-1705,91	-0,26	1,02	-1737	0,000773
2001	-1251	-1344,18	4,61	0,94	-1253	0,001241
2002	-146	-391,43	10,52	0,40	-153	0,046451
2003	-1524	-1292,01	-8,02	1,14	-1483	0,026999
2004	-1010	-1067,77	3,23	0,96	-1017	0,007235
2005	-805	-858,82	3,08	0,94	-803	0,002612
2006	-1049	-1010,04	-0,52	1,03	-1044	0,004315
2007	-650	-723,75	3,85	0,90	-651	0,002177
2008	1141	759,03	15,82	1,47	1142	0,000522
2009	487	542,72	-1,17	0,93	502	0,029864
2010	-1921	-1416,34	-18,60	1,33	-1915	0,002934
2011	4117,5	2983,96	44,99	1,38	4173	0,013421
2012	4635,5	4297,20	14,12	1,09	4715	0,017186
2013	4092	4134,03	-0,64	1,00	4113	0,005089
2014	1152	1762,83	-22,72	0,67	1167	0,012905
2015	1053	1198,40	-4,65	0,87	1036	0,01568
2016	-157	120,64	-9,79	-1,19	-132	0,157728
2017	121	120,93	0,99	0,89	109	0,102299

Following the obtained adaptation parameters, our forecast for 2020 based on Formula (3) is 110 persons or twice less than mean expected growth of population. Such a situation is one of the key factors adversely affecting the development of this region due to the lack of labor resources required to support production processes.

So, what is the critical reason for such low migration attractiveness?

The following indicators for the period of 2004-2016 necessary for Vladivostok were chosen to calculate the integral attractiveness index.

– Ecological: carbon dioxide emissions, thousand tons; atmospheric emissions of particulate matters, thousand tons;

– Economic: minimum of subsistence, rubles; the proportion of the population with income lower than the minimum of subsistence, level of employment, %; average monthly salary, rubles; gross municipal product, rubles per capita;

– Social: life expectancy, in years; infant mortality, persons; number of registered crimes; housing stock area, thousand sq. m.

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The source of data for analysis and calculation of the integral attractiveness index and coefficients of econometric models have served as indicators of statistical compilations: Atmospheric pollution in cities of Russia in 2016, socio-economic indicators of Primorski Krai, as well as the results of the economic monitoring of the city Vladivostok for 2016. Fig. 4 shows the dynamics of the integral attractiveness index of life in Vladivostok.

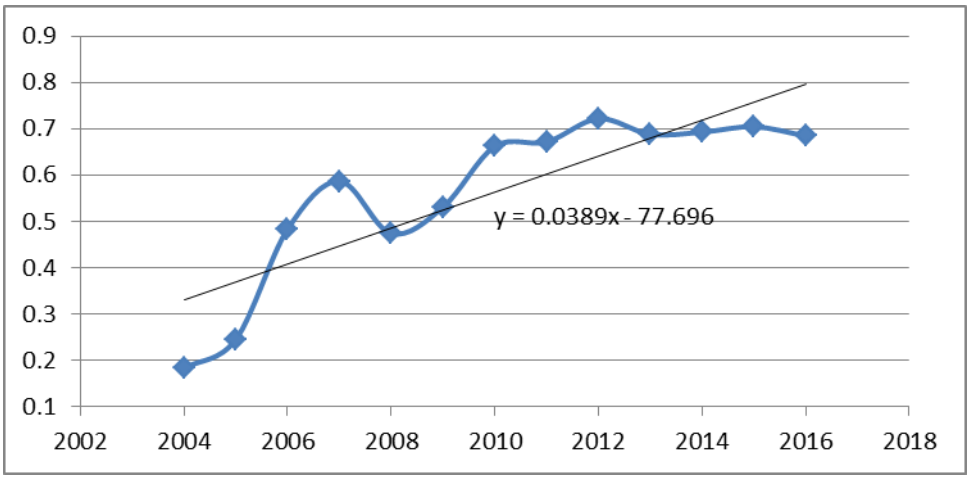

Fig.4. The dynamics of the integral index of attractiveness

The graph traces the remarkable rise of the attractiveness index of living in Vladivostok (the index value changed from 0.18 in 2004 to 0.72 in 2012), associated with the construction and preparations for the APEC Summit in 2012. Reducing the attractiveness of index values observed in 2013 (the index value of 0.68). During this period, there has been a substantial outflow of people, whose professional activity was associated with the construction and commissioning of the main objects of the Summit, which lasted from 2008. The attractiveness index value from 2013 is stable and corresponds to a relatively high standard of living on a scale of Harrington. In general, the attractiveness index value corresponds with a sufficiently high level of life according to the Harrington's scale.

Several measures aimed at economic and social city development are characteristic of each desirability scale. Therefore we shall now calculate the forecast for the leading economic indicator of the city development – gross municipal product, and determine the main factors influencing its growth.

A time series was used as initial data for building a model with the following elements: annual GMP growth rates for a period of record from 2003 to 2016. Augmented Dickey-Fuller test showed that the series of the first finite differences are stationary. The model was implemented in Gretl software package for econometric analysis.

After model fitting and validity check an ARMA-type model was received (2,1,1). Calculation data are given in Table 5. The calculation data are given in Table 4. All model coefficients are significant; the remains do not go beyond the boundaries of the confidence interval and are typically distributed.

The actual value of GMP2016 is 224.8 thousand rubles/person.

Table 5. Calculation data of ARIMA model coefficients (2, 1, 1)

Model: ARIMA, observations 2003-2016 were used (T = 14) Estimated using the Kalman filter (exactly Max likelihood method) Dependent variable: (1-L) VMP_temp	Mean square error (MSE) 0,020671 Root of mean square error (RMSE) 0,14377 mean absolute error (MAE) 0,10387

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Standard errors are calculated based on Hessian Coefficient St. error z P-value --- const −0,0191301 0,00591884 −3,232 0,0012 *** phi_2 −0,404941 0,245212 −1,651 0,0987 * theta_1 −1,035000 0,246846 −4,051 5,10e-05 ***	Average absolute percentage error (MAPE) 8,6796 U- Teil's statistics (Theil's U) 0,7474

For 95% confidence intervals, z(0,025) = 1,96

Observ.	VMP_temp	Prediction	St. error	95% confidence interval
2017	not defined	1,01618	0,122944	(0,775218, 1,25715)

The projected value of GMP2017 calculated according to the model equals to 228.4 thousand rubles/person. In general, the GMP growth rate has demonstrated a tendency to slow down (VMP_temp=-0.0202t+41.666), which is a backdrop for a small increase of the GMP volume forecasted for 2017 in comparison with the previous year.

Investment analysis showed that the investment lag is 3 years; to obtain this value we successively calculated correlation coefficients between the GMP and the volume of investments raised by the municipal budget with time lags of 1-4 years: R1 = 0.222; R2 =0.589; R3 = 0.656; R4 = 0.327. R1 = 0,222; R2 =0,589; R3 = 0,656; R4 = 0,327. This dependency is demonstrated by the graph (Fig. 5).

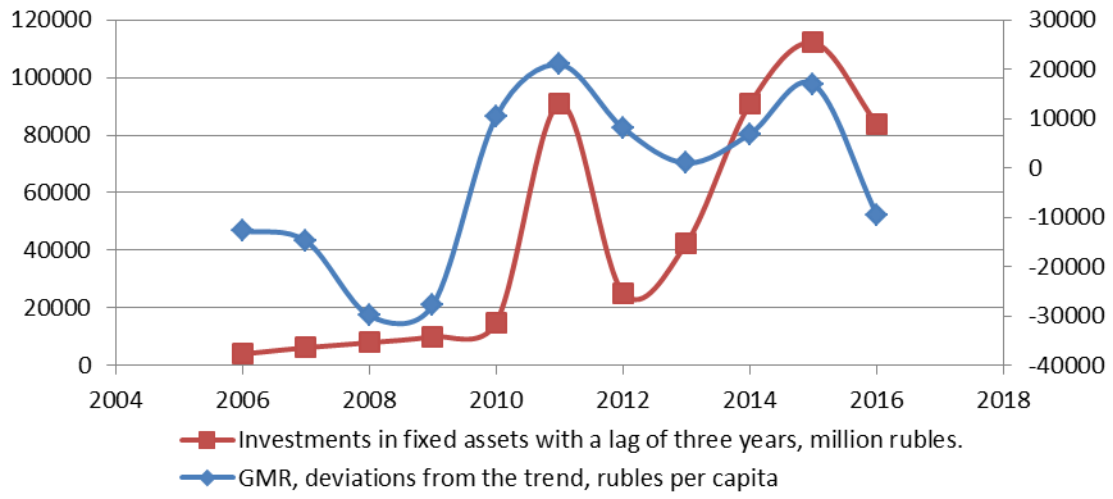

Fig. 5. The dynamics of investment in fixed capital in Vladivostok city and GMP trend deviations

Based on preliminary analysis of statistical database values X1 – X11 (Table 6) were selected, which were convolved (formulas 3-4 – 2) into aggregates Z1 – Z3. Each of them assays one of the main factors having an impact on GMP growth. The aggregates were used to build an equation of multiple linear regressions. Dependent variable Y – the GMP per head of population of Vladivostok city, rubles per person, modified to the level of 2002. Not all aggregates are significant according to the Student's t-test, which may be explained by a short period of record. However, we do not set ourselves a task of forecasting; that is why we included them in the regression model based on economic feasibility.

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Table 6. Assessment of factors of development of Vladivostok city, for the period of 2002-2016

Factor	Indicators of the level of development of Vladivostok city, modified to the level of 2002, %	Weight factors wi	Regression coefficients	Elasticity	Factor rank
Z1, m1=3 Economic	X1 Mining operation	0.30	0.79	0.44	2
	X2 Manufacturing	0.35			
	X3 Generation and distribution of power, gas, and water	0.35			
Z2, m2=4 Social	X4 Average monthly salary	0.43	0.86	1.54	1
	X5 Amount of registered crimes	0.28			
	X6 Number of passengers carried by buses per year using intra-urban routes	0.19			
	X7 Area of built domestic houses	0.10			
Z3 m3=4 Ecological	X8 Atmospheric emissions of particulate matters	0.31	-0.48	-0.09	3
	X9 Nitrogen dioxide emissions	0.16			
	X10 Sulphur dioxide emissions	0.38			
	X11 Carbon dioxide emissions	0.15			

5. Discussion

Analysis of data given in Table 6 provides for the following conclusions. The most significant and positive is not economic, but the social factor – the highest elasticity coefficient corresponds to it. Therefore, the more funds are invested in the development of social spheres and city infrastructure, the higher the GMP growth rate, and the more attractive the city becomes for the population (Bykanova et al., 2017).

Environmental factor has a significantly strong negative impact on the GMP growth of Vladivostok city despite significant investments in this field. Elasticity value of this factor is not the highest one, which is explained by a significant time lag between hazardous substances emission and consequences affecting the health of the city population. We consider that improvement of the environmental situation in the city shall be one of the essential areas of the outward-looking public policy.

To ensure the growth of the BMP, it is necessary to reconcile the social and economic interests of residents and local businesses which is expressed, first of all, in a comprehensive municipal policy (Fig. 6). Various forms of interaction are required to create and maintain partnership relations between representatives of business, municipal authorities, and urban community. We identify three key points of interaction.

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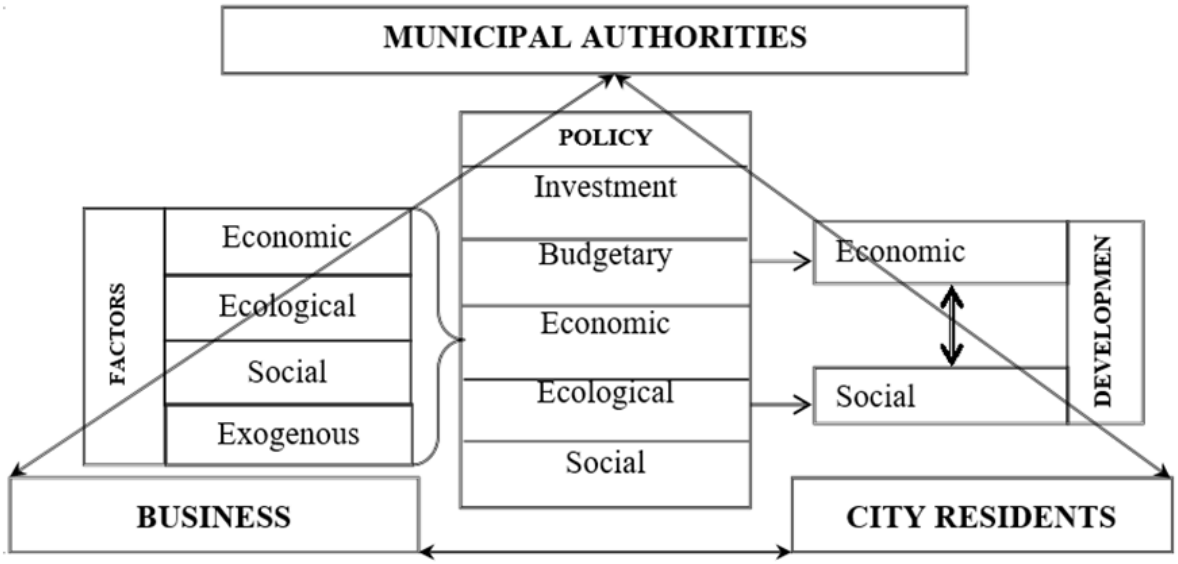

Fig. 6. The pattern of interaction between city structures

1 Local authorities – Business, areas: implementation of priority national projects and programs of the city socio-economic development; financial backing of environmental projects; promoting the development of various businesses.

2 Local authorities – City residents, areas: transparency and awareness; exposure of information about budget expenditures in the social sphere; civic responsibility, and public involvement.

3 Business – City residents, areas: job security for people; financial backing of donation funds

Conclusion

Our model will allow creating scenarios and justifying predictive and analytical indicators of the city economy. However, to assess the effectiveness of the local socio-economic policy, a system of feedback monitoring is required, i.e., the decision-making process shall be coordinated between all structural elements of the city system. Otherwise, the city will only be a point of attraction of federal investments, and not the "point of economic growth and social development."

References

Balynskaya, N. R., and Ponomarev, A. V. (2018). Current issues in the development of modern political and economic processes in Russia and Europe. *Economics and Politics*, *2*(12), 5-7.

Belova, T., Bakhitova, R., and Lakman, I. (2016). The Dynamic model of the economy of the city of Ufa. *Reports of the University of Bashkir*, *1*(1), 178-182.

Bikas, E., and Saponaitė, V. (2018). Behavior of the Lithuanian investors at the period of economic growth. *Entrepreneurship and Sustainability Issues*, *6*(1), 44-59. http://doi.org/10.9770/jesi.2018.6.1(4)

Bogomolova, I., and Mashentseva, L. (2015). Methods of assessment of factors ensuring sustainable development of major cities. *Journal of Russian entrepreneurship*, *16*(16), 2509-2520.

Bykanova, O. A., Akhmadeev, R. G., Kosov, M. E., Ponkratov, V. V., Osipov, V. S., and Ragulina, Y.V. (2017). Assessment of the economic potential of sovereign wealth funds. *Journal of Applied Economic Sciences*, *12*(1), 70-84.

Caragliu, A., Del Bo, C., and Nijkamp, P. (2011). Smart cities in Europe. *Journal of Urban Technology*, *18*(2), 65-82.

Chen, A., and Coulson, N. (2002). Determinants of urban migration: Evidence from Chinese cities. *Urban Studies*, *39*(12), 2189–2197.

Daher, E., Kubicki, S., Guerriero, A. (2017). Data-driven development in the smart city: Generative design for refugee camps in Luxembourg. *Entrepreneurship and Sustainability Issues*, 4(3), 364-379. https://doi.org/10.9770/jesi.2017.4.3S(11)

Doolina, N., Kuznetsova, S., Lebedeva, V., and Tokarev, N. (2004). *Modern Russian city: theory, methodology, and practice of research. The collective monograph.* Volgograd: Publishing house: VSTU, 453p.

Eliseva, I., Kurysheva, S., Kosteeva, T., Pantina, I., Mihajlov, B., Neradovskaja, Y., Rybkina, L. (2008). *Econometrics.* Moscow: Finance and statistics Publ., 256p.

Estevez, E., Vasco Lopez, N., and Janowski, T. (2016, April). *Smart Sustainable Cities – Reconnaissance Study. United nations university. Operating unit on Policy-driven. Electronic Governance.* Retrieved from joinup.ec.europa.eu: https://joinup.ec.europa.eu/sites/default/files/document/2016-04/smart_cities_report.pdf

Fomina, A. V., Berduygina, O. N., Shatsky, A. A. **(**2018). Industrial cooperation and its influence on sustainable economic growth. *Entrepreneurship and Sustainability Issues*, *5*(3), 467-479. https://doi.org/10.9770/jesi.2018.5.3(4)

García-Fuentes, M. A., de Torre, C. (2017). Towards smarter and more sustainable regenerative cities: the REMOURBAN model. *Entrepreneurship and Sustainability Issues*, 4(3), 328-338. https://doi.org/10.9770/jesi.2017.4.3S(8)

Gandini, A., Garmendia, L., San Mateos, R. (2017). Towards sustainable historic cities: mitigation climate change risks. *Entrepreneurship and Sustainability Issues*, 4(3), 319-327. https://doi.org/10.9770/jesi.2017.4.3S(7)

Habibrahmnova, R. (2011). *Strategic management development the most significant city as a spatial socio-economic system of the thesis for a degree of candidate of economic sciences.* Kazan, 254p.

Harrison, C., and Donnelly, I. (2011). *Theory of smart cities. Proceedings of the 55th Annual Meeting of the International Society for the Systems Sciences.* Canada: niversity of Hull Business School

Hydan, R., Koehler, A., Ird, J., and Snyder, R. (2008). *Forecasting with Exponential Smoothing: The State Space Approach.* Berlin: Springer-Verlag Berlin Heidelberg.

Karkavin, M. (2011). Conditions and trends of strategic socio-economic development of small and medium-sized cities. *Fundamental research*, *8*(3), 694-697.

Kazantsev, I., and Svetunkov, M. (2004). *Urban sociology: textbook.* Moscow: Publishing house Mashinostroenie.

Kobzar, A. (2006). *Applied mathematical statistics.* Moscow: PHYSMATHLIT, 375p.

Kominos, N. (2015). *The Age of Intelligent Cities. Smart environments and innovation-for-all strategies.* New York: Routledge, 453p.

Krinichansky, K., Bezrukov, A., and Lavrent'ev, A. (2015). The Factors of economic development of cities in the region. *Regional economy: theory and practice*, *28*, 54-68.

Lazaroiu, G., and Roscia, M. (2012). Definition methodology for the smart cities model. *Energy*, *47*(1), 326-332.

Lombardi, P., Giordano, S., Farouh, M., and Wael, Y. (2012). Modelling the smart city performance. *Innovation: The European Journal of Social Science Research*, *25*(2), 137-149.

Lyubushin, N., and Bricats, G. (2014). The Use of the generalized desirability function of Harrington in multivariable economic problems. *Economic analysis: theory and practice, 18*(369), 2-10.

Manaeva, I., and Rastvortseva, S. (2016). Economic and mathematical model of forecasting the socio-economic development of a single-industry town. *Economic analysis: theory and practice, 10*, 131-139.

McFarlane, C. (2010). The comparative city: knowledge, learning, urbanism. *International Journal of Urban and Regional Research, 34*(4), 725-742.

Oates, M., Melia, A., Ferrando, V. (2017). Energy balancing accross cities: Virtual Power Plant prototype and iURBAN case studies. *Entrepreneurship and Sustainability Issues*, 4(3), 351-363. https://doi.org/10.9770/jesi.2017.4.3S(10)

Oleinik, E., and Zakharova, A. (2016). Evaluation of the Major Factors of the Region's Investment Activity. *Indian Journal of Science and Technology, 9*(36), 1-7.

Pierce, P., and Andersson, B. (2017). Challenges with smart cities initiatives - A municipal decision makers' perspective. *Proceedings of the 50th Hawaii International Conference on System Sciences*, 2804-2813.

Rakhimova, G. (2014). Structural elements of the sources of potential of regional economy. *Journal of Contemporary Economics Issues*, *1*. https://doi.org/10.24194/11406

Raman, S. (2010). Designing a Liveable Compact City: Physical Forms of City and Social Life in Urban Neighborhoods. *Built Environment, 36*(1), 63-80.

Reiss, P., and Wolak, F. (2007). Structural econometric modeling: Rationales and examples. From the industrial organization. *Handbook of Econometrics, 6A*.

Sadovnikova, N., and Shmojlova, R. (2011). *Time series analysis and forecasting. Tutorial.* Moscow: University Publishing House "Synergy".

Shmankevich, T. (2005). *Baikal Siberia: what constitutes stability.* Moscow: Natalis.

Sikora-Fernandez, D. (2013). Smart city concept in the assumptions of the urban development policy – polish perspective. *Acta Universitatis Lodziensis Folia Oeconomica, 290*, 83-94.

Stock, J., and Watson, M. (2010). *Introduction to Econometrics. 3rd edition.* Addison-Wesley.

Takhumova, O. V., Kasatkina, E. V., Maslikhova, E. A., Yumashev, A. V., and Yumasheva, M. V. (2018). The main directions of increasing the investment attractiveness of the Russian regions in the conditions of institutional transformations. *Espacios, 39*(37), 6.

Ufimtseva, E. (2014). The study of public infrastructure facilities in terms of regional socio-economic processes. *Economic Revival of Russia, 2*, 85-92.

Ufimtseva, E., Minaev, N., Volchkova, I., and Merkuleva, Y. (2015). Infrastructural Interactions Governance Model of Urban Services in the Context of Socio-Economic Development of the City. *Mediterranean Journal of Social Sciences, 6*(3), 183-189.

Vakulenko, E. (2012). Migration in Russia: econometric analysis. *Applied econometrics, 1*(25), 25-50.

Vining Jr., D. (1982). Migration between the Core and the Periphery. *Scientific American, 247*(6), 37-45.

Vinogradova, N. (2015). Methods of evaluation of social development. *Journal of Contemporary Economics Issues*, *1*. https://doi.org/10.24194/11506

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MODEL OF STATISTICAL ECONOMIC PROFILE OF INNOVATIVE BIOMEDICAL PRODUCT VALUE FORMATION AND UPDATE*

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Abstract. Modern global science develops various concepts, theories, and models that have a certain value in different sectors of national economy. While there is a significant scientific foundation in the field of basic and applied research in biomedicine and biotechnology nowadays, this line has not gained proper momentum in economic terms. This concerns both formation of value, including value added, of innovative biomedical products and its accounting at the micro level, as well as innovation value formation and update at the government level. For these purposes, it is proposed to use statistical accounting as the basis for studying the quantitative side of innovative product value creation stages in the medical field. The purpose of statistical accounting is both to accumulate the most complete meaningful information and data characterizing essential conditions of these processes and their results and to create an information base for regulating the phenomena of added value formation and update in the field of biomedicine and analyzing their trends and patterns based on a system of interrelated quantitative and qualitative indicators. The article forms a macro- and mesostructure of a statistical economic profile of innovative biomedical product value formation and update and shows the level of cost blocks in groups of cost indicators of the profile. An equation for value formation in major elementary subprocesses was derived: full or partial employment of resources, formation of added value of a staple product, resources, and by-products. The proposed mathematical model is decomposed into three equation components: full and partial employment of resources as well as generation of all the elements of value added. Introduction of the authors' development would allow to ensure a systematic quantitative assessment of key aspects of the added value formation and update processes in the field of biomedicine.

Keywords*:* value added, innovation, costs, biomedicine, statistics

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1. Introduction

Today, the biomedical and biotechnology sector is an important area in modern post-industrial economy but its status in the world and in the Russian Federation has a dual character. On the one hand, developed countries are top producers of biotechnologies, while developing countries determine the demand for such products. The growth rate of global biotechnology market is about 10% per year. By 2020, it is planned to increase it to 600 billion dollars (Market Watch, 2014). On the other hand, world globalization is rapidly engaging developing countries in mass production. While 40% of the global commodity market in 2014 was made up of the USA, Europe, Canada, Australia, these days, countries of the Asia Pacific region, in particular, China, India, and Brazil, have significant market power. However, Russia still lags behind the leading countries both in the biopharmaceutical output indicator and the share of exports in the biotech production.

Emerging markets, including Russian, are marked with dependence on the import of foreign pharmaceutical products, as well as a shortage of innovative biotechnological products.

With regard to a complicated geopolitical situation and the effect of economic sanctions, Russia has begun to mainstream government projects to develop priority innovative industries. Nowadays, the modern biomedical industry in the Russian Federation is developing based on the Medical Science Development Strategy until 2025, which objectives are the medical research sector development, the domestic biomedicine integration into the global scientific and innovative environment, improvement of fundamental and applied research, ensuring a decent financing standard, and introduction of a medical science management system (Korostelkina et al., 2018).

Despite an increase in the investment activity of domestic producers and the import substitution policy (Vorotnikov et al., 2019) imported biotech drugs dominate the Russian market. Reasons for the lack of a sufficient number of innovative domestic medical drugs include a payback period of innovation and R&D in biopharmaceutics, high risks, and lack of clear government regulation and distribution guarantees.

Effective development of the industry that serves as a guarantor of humanitarian well-being, national independence and a strategic guideline of state policy, as well as its sustainability and competitiveness in the world market should be ensured by a multidisciplinary nature of basic and applied research, development of new scientific and technological paradigms, and development of relevant industries. This, in turn, determines the incredibly rapidly growing global market for high-tech medical care with a huge demand for innovative products (knowledge, technology, products, etc.) (Public analytical report on the scientific-technological direction «Biomedicine», 2015).

At the same time, what is important is not only innovative development of bio-pharmacology, effective coordination of science, medicine and health care, but also public policies aimed at stimulating certain areas of the industry. Target orientation and purpose of government financing for state-of-the-art knowledge areas can be established through an integrated information system for accounting, analysis and control of performance indicators, which would serve as a communication mechanism between the state, business, science, and education.

Biomedical enterprises are marked by innovativeness of products with high added value that has to be kept track of, analyzed, evaluated and controlled for the purposes of updating and planning, creating innovative products by the pharmaceutical industry, and eliminating threats and external challenges for national biomedical research.

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Analysis of the size of updated added value of innovative products at the micro, meso and macro levels allows for an enterprise performance characteristic, for assessment of a region's situation and contribution to the national economy, as well as of the national economy in particular terms. Statistics of added value formation and update in the field of biomedicine is a rather important and significant section that serves both as a scientific activity and as a type of practical activity of state statistical authorities that ensures effective operation of other government agencies.

In this context, the development of applied statistics in terms of creating an economic profile for innovative biomedical product value formation and update would allow one to assess value (cost) indicators at different stages of creating the value of an innovative product–from an idea and its scientific development to commercialization at a startup or company level (in the financial accounting system) and the state (in the statistical accounting system). The proposed development builds up comprehensive information support for assessing the corporate and social value of innovation.

2. Literature review

The cost factor of innovation activity has always played a crucial role in the process of creating innovation. Any innovative product has a value and competitive advantages, whereby the manufacturer can influence consumers of the innovation and build its value. A cost is determined both by the enterprise itself, taking into account all the costs of creating and commercializing the product and a profit (micro level added value) and the government, whereby the activities of all the national economic sectors and their effectiveness are evaluated (macro level). While the added value of a PARTICULAR product can be calculated, analyzed and estimated using appropriate accounting practices and systems, the added value of innovations created in the state and on an industry-by-industry basis is difficult to estimate due to a lack of an integrated information system of statistical accounting.

Thus, our study covers not only the essence of innovation as such but also the issues of its cost accounting, forming and updating its added value and creating a statistical economic profile of innovative biomedical product value.

The issues of accounting and analysis of cost indicators gained serious scientific recognition in the 20th century. Cost indicator accounting and methods of its analysis and evaluation were considered by Bentson (1982), Frolov and Maslova (2017), Popova et al. (2019) and others.

Innovative theories in the dynamic and evolutionary terms were developed by Schumpeter (1989), Drucker (2003), etc. The category of "innovation" is characterized by universality, a wide scope of application and complexity of its structural elements that have many approaches to its definition. According to Schumpeter (1989), it is innovations that are the "pivot of a new type of competition" and give rise to long business cycles. The scientist developed an innovative theory of long waves that was later integrated into the general innovation theory of economic development.

Drucker (2003) considers innovation as a socio-economic concept, identifying an improved return on invested resources as the goal of an innovative solution. Kleyner (1986) made a significant contribution to the study of innovation systems and innovation activities as well as factors that have a direct impact on the effectiveness of innovative development.

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However, innovations as such cannot and should not be considered in isolation from cost characteristics; therefore, many scientists, including Popova et al. (2019), Marenkov (2006), Rozhkova and Kutyleva (2014) propose specific mechanisms for innovative product value formation.

Global value chains (Kersan-Škabić, 2017; Tvaronavičienė, 2019) are explored internationally, including in the trade relations between the old world and the new EU member states, as well as the management of such chains (Frederick & Gereffi, 2009; Koval et al., 2019) and evolution of the economic value added of managerial innovation in developing countries (Chiwamit et al., 2017; Aichele & Heiland, 2018) derive structural equations for value-added trade flows on the basis of a multisectoral gravitational model with cross-sectoral links. In terms of industry, the cost of innovation in biomedicine is analyzed by Wesseler and Von Braun (2017). The scientists propose methods for measuring bioeconomy and analyze problems and drivers of its development. Detournay et al. (2018) identify the criteria and proposed and tested the model used by the French health care authorities to estimate the clinical value added (ASMR) of drugs, based on descriptive statistics and logistic models.

It is possible to estimate the cost of innovations using various methods that include both calculation (Udpa, 1996) and financial methods, for example, a discounted cash flow method, a weighted average capital cost estimate method (Luehrman, 1997) and others, including the authors' updated methods of present value estimate, which are appropriate to use under real-life conditions of innovation economy. Pulic (2000) refers VAIC method to such tools; it serves to measure and monitor the effectiveness of value creation using accounting indicators. Intellectual capital in the innovation cost estimate system plays a crucial role.

At the same time, the issues of statistical accounting of added value formation and update are not openly raised by either world or national science at present. González et al. (2018) explore the convergence of public accounting systems in the EU and offer an alternative to the current public accounting model based on an adjustment system. In this regard, the urgency and necessity of this research into statistical trends, including the cost of innovation industry's product, become obvious.

3. Methodology

The study appeals to the key aspects of the scientific problem, revealing the interaction of rationalistic and Neo-Positivist empirical approaches. This will allow one to collect exhaustive information for analyzing and studying the issues of accounting and estimate of value added.

System approach is one of the most important conditions for comprehensiveness of a study, whereby the methods and tools for estimating the value added of innovative products in the biomedical industry are considered as a complex system and at the same time as an element of even more complex and larger-scale systems–innovative economy.

The systemic nature of added value formation and update statistics in the field of biomedicine involves consistency and completeness of indicators used to describe and analyze interrelated aspects of these processes.

To collect, to process and to analyze statistical data, the added value formation and update statistics in the field of biomedicine uses traditional statistical tools.

The research toolbox is composed of methods of structural-dynamic, comparative and statistical analysis, as well as of graphic scientific classification, simulation, and decomposition methods. The concepts of innovation and of the theory of value are fundamental theoretical background of the research. This study is underlain by socio-economic comparative studies and interdisciplinary nature.

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The following will be used as methods of economic research: formal logic using analysis techniques, comparison and analogy in order to study the world practice and domestic experience of accounting cost indicators, as well as dialectics with the historical method to study the retrospective of statistical indicators of economic development of states. The use of these approaches and methods will allow us to propose a statistical economic profile of innovative biomedical product value. A systematic quantitative description of the main aspects of these processes should be provided from statistics on added value formation and update in the field of biomedicine.

4. Discussion and results

The basis for collection and aggregation of statistics on the processes and results of formation and update of the added value of innovative biomedical products is provided by a system of elementary statistical indicators that form a statistical economic profile of a process, a phenomenon, or a project.

The statistical economic profile of the processes of formation and update of the added value of innovative biomedical products, which is principally a model or a prototype serving to draw up a primary statistical accounting document, establishes the main information content describing a phenomenon.

The macrostructure of a statistical economic profile of innovative biomedical product value can be based on the following value assessment and information organization principles (Figure 1). Block 0 (moment constant) is required to create opportunities for comparing statistical data in time and space.

The value assessment concepts alongside with the accounting and reporting data ownership serve as fundamental bases for building an economic phenomenon profile structure.

A cost-based assessment concept that corresponds to accounting the added value formation in the field of biomedicine at different stages of creating value of an innovative product, from an idea and its research and development to commercialization, and makes it possible to evaluate and account the public value of innovation from the cost perspective at the state level.

A profit-based assessment concept that corresponds to accounting of the added value update in the field of biomedicine at different stages of creating value of an innovative product, from an idea and its research and development to commercialization, and makes it possible to evaluate the public value of innovation from the value perspective at the state level.

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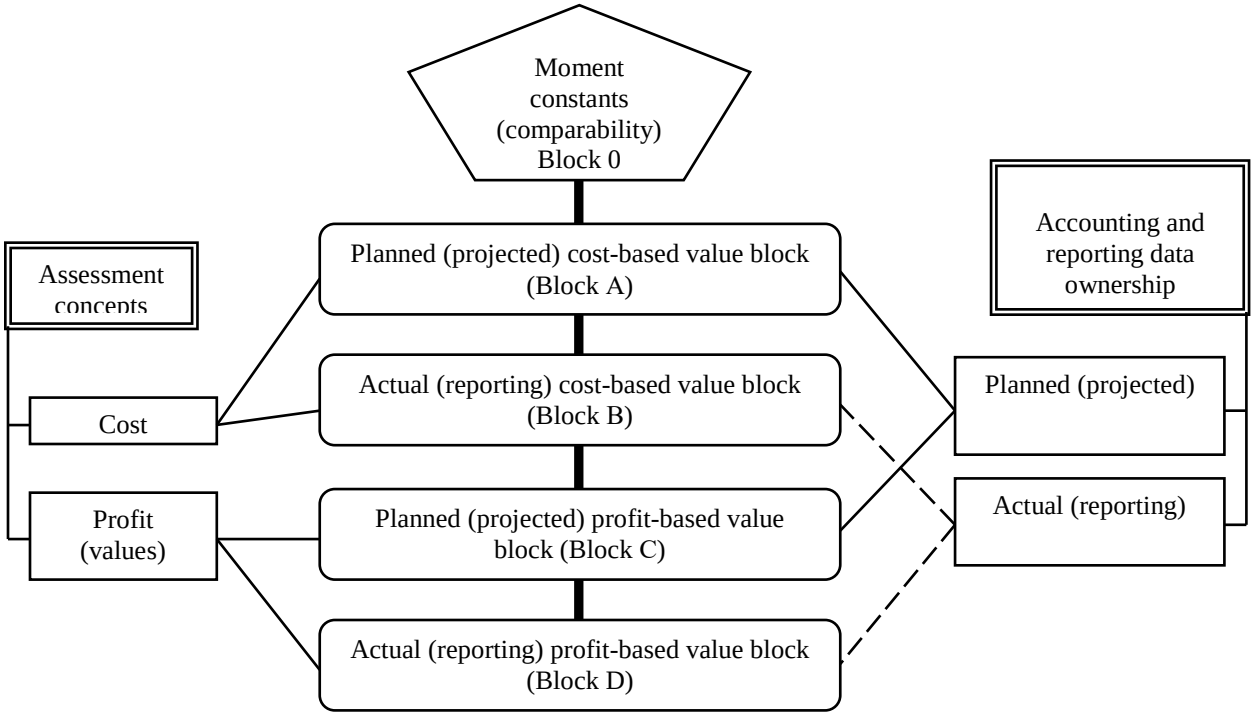

Fig.5. Macrostructure of a statistical economic profile of innovative biomedical product value formation and update

The combination of planned (projected) and actual (reporting or historical) values of indicators in the statistical economic profile of a phenomenon offers opportunities to improve the quality of planning and management of economic processes based on respective analysis, which ultimately improves the reliability of economic performance and its efficiency and offers prospects for optimizing their achievement in terms of resources expended, applied equipment and technologies, obtaining additional products and better fulfilling their value.

The mesostructure of individual blocks of the statistical economic profile of innovative biomedical product value formation and update is presented in Figure 2.

The moment constants serve as coefficients for reducing the cost and conditionally physical indicators arising in widely varying time or geographic conditions. The list of constants is non-exhaustive and its composition depends on the used and prospective methods to reduce indicators.

The mesostructure of the main planned and respective reporting blocks of the statistical economic profile of innovative biomedical product value formation and update is identical. That is, the nomenclature of groups of indicators in block A is the same as in block B, and in block C it is the same as in block D.

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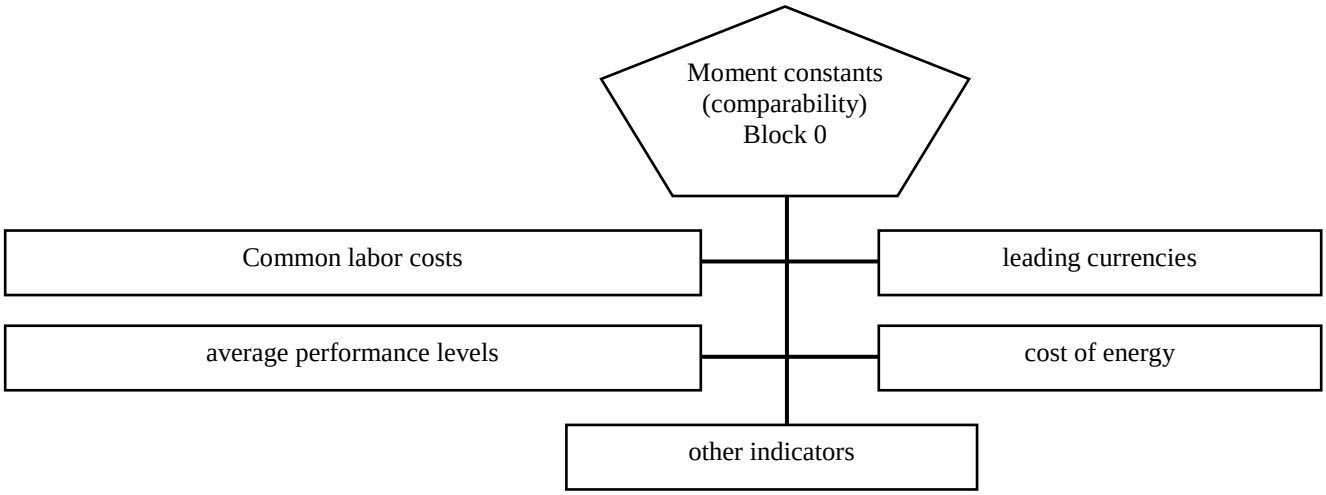

Fig. 2. Mesostructure of the statistical economic profile of innovative biomedical product value formation and update: Block 0– Moment constants

Dramatic differences between the indicator group nomenclatures are caused by the orientation of the statistical economic profile sections in accordance with the respective concept of assessment. Thus, the cost component of the profile (blocks A and B) combines the following main groups of indicators of innovative biomedical product value and added value formation, detailed according to value creation stages (Figure 3).

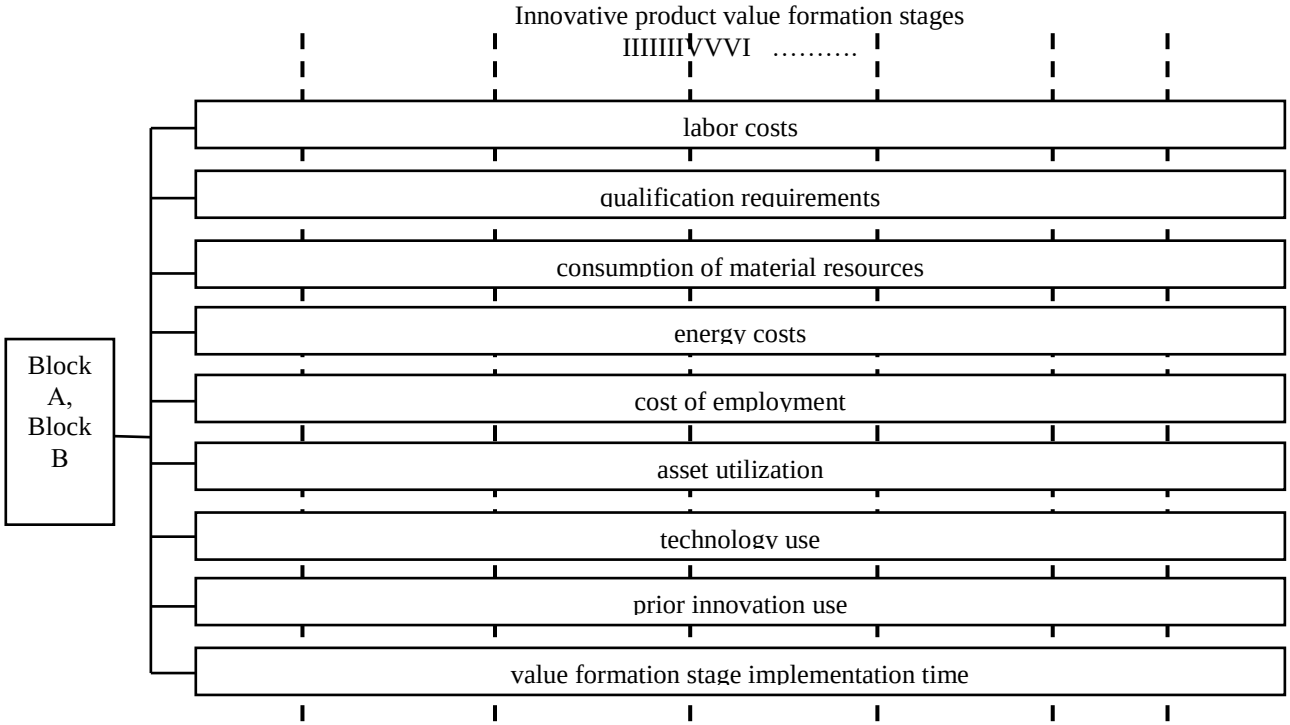

Fig. 3. Mesolevel of the cost block structure by groups of indicators in the statistical economic profile of innovative biomedical product value formation, including value added

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The most profound analyticity of data on cost-based value formation is achieved at the microlevel of the statistical economic profile structure in terms of value creation stages. The mesostructure is detailed down to the micro level–the level of elementary indicators on a component-by-component basis (Table 1).

Table 1. Detailed cost indicators at the mesolevel of statistical economic profile of innovative biomedical product value formation and its value added

No.	Mesostructure	Indicators
1	*labor costs*	a) labor intensity; b) number of personnel; c) performance in natural and cost measures, etc.
2	*qualification requirements*	a) individual differentiation; b) number of personnel; c) differentiation by type of qualification; d) differentiation by skill level; e) achievements; f) innovative discoveries; g) qualification accumulation; h) embedded foreign qualification holders; i) labor intensity differentiated with respect to qualification; j) personal and group performance in natural and cost measures
3	*consumption of material resources*	a) differentiation with respect to types of material resources expended; b) accounting of natural (quantity, quality) and cost characteristics of the material resources expended; c) identification of key production and technical characteristics of the material resources expended
4	*energy costs*	a) differentiation with respect to types of resources expended; b) accounting of natural (quantity, quality) and cost characteristics of the energy resources expended; c) identification of key production and technical characteristics of the energy resources expended
5	*cost of employment*	a) cost of employment differentiated with respect to types of qualification; b) employment cost differentiated with respect to skill levels
6	*asset utilization*	a) key operating characteristics of fixed assets used; b) cost characteristics of fixed assets used; c) depreciation of fixed assets
7	*technology use*	a) key operating characteristics of the technologies used; b) cost characteristics of the technologies used; c) technology use depreciation rates
8	*prior innovation use*	a) key production characteristics of the innovations used; b) cost characteristics of the innovations used; c) innovation use depreciation rates

The income component of the profile (blocks C and D) combines the following principal directions for formation of innovative biomedical product value update indicators and its added value indicators detailed by value creation stages (Figure 4).

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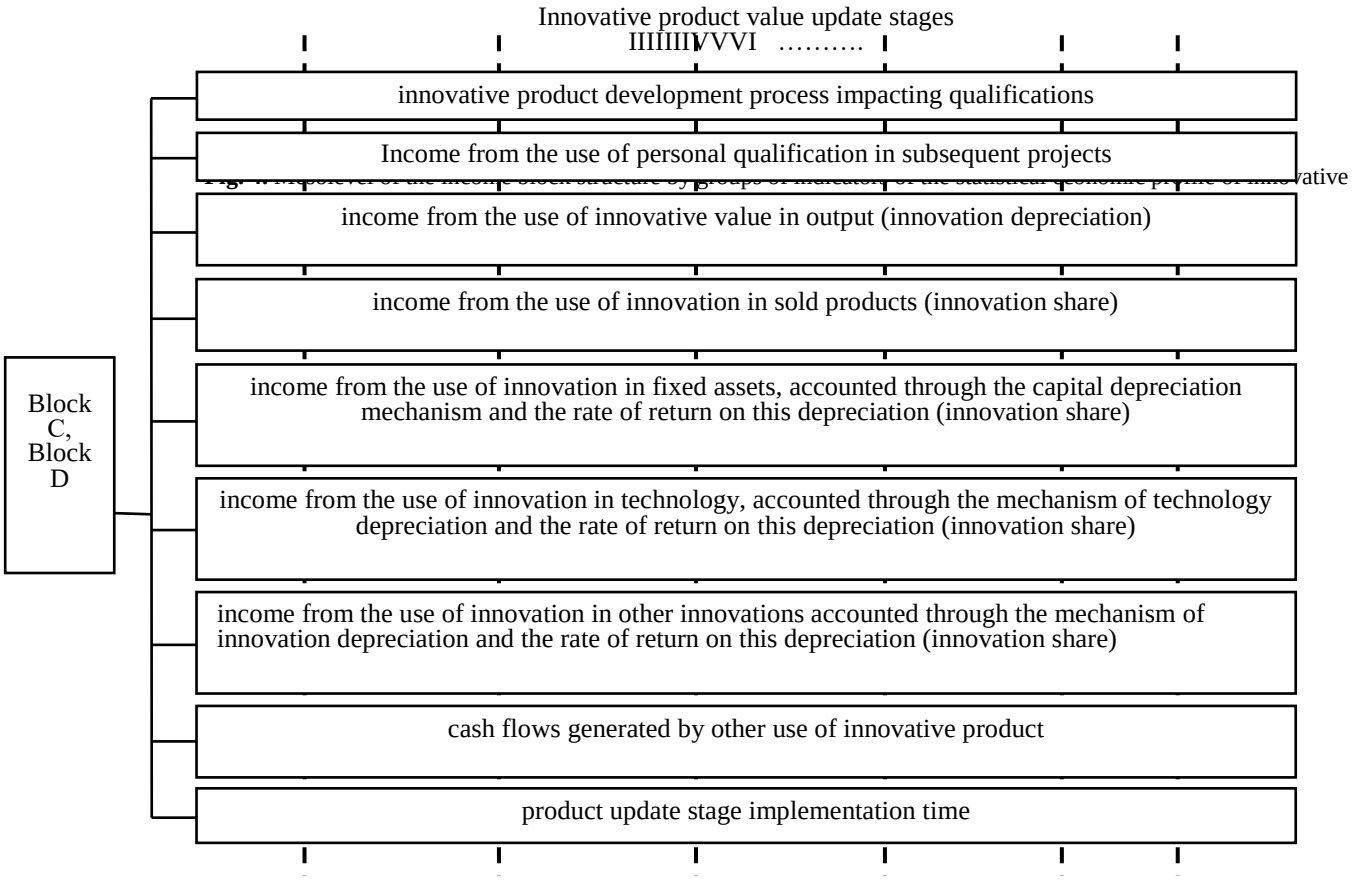

The integration of innovations into subsequent economic objects and processes should be taken into account in natural and cost measures.

Intersection of data in statistical economic profiles of projects for innovative biomedical product development, processes of value formation and update, profiles of personal qualification trajectories, and innovative product profiles will create conditions for checking data accuracy and reliability and comprehensive analysis of economic phenomena in the field of innovative biomedical product value and added value formation and update.
In order to develop a statistical accounting model for added value formation and update in the field of biomedicine, it is necessary to present a value formation equation. In the process of value formation for any object (product), a number of basic elementary subprocesses can be identified:
- full employment of resources;
- partial employment of resources;
- generation of value added and formation of an object value;
- generation of value added of the resources utilized;
- generation of scrap and by-product value.
In general, a value formation equation can take the form:

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$$X = Y, \qquad (1)$$

where X are components of the value used and the value added, Y is the value obtained.
Full employment of a resource occurs when the resource utilized in the value creation process is totally consumed, transferring its value to an object (product). Examples of such resources are materials, some tools and implements, fuel and energy resources, etc. An equation with transfer of the value of a totally consumed resource in this case will be as follows:

$$Vwci + X0 = V' + Y0, \qquad (2)$$

where $Vwci$ is the cost of the i -th totally consumed resource, $X0$ is the other components of the value used, V' is the resulting value of the object (product), $Y0$ is the associated resulting value.

Grouping the cost of all the totally consumed resources, we obtain the first component of the equation:

$$\sum_{i=1}^{n} Vwci \qquad (3)$$

and the equation with the first component takes the form:

$$\sum_{i=1}^{n} Vwci + X0 = V' + Y0 \qquad (4)$$

In the case of partial utilization of resources in the process of value creation, a resource cannot be fully employed but it transfers its value to the object (product) in the amount of its share, $\Delta Vfaj$.
Similarly, a value transfer formula for partially utillized resources would be written as follows:

$$\Delta Vfaj + X1 = V' + Y0, \qquad (5)$$

where $\Delta Vfaj$ is a share of the j-th partially used resource value, $X1$ is the other value components, V' is the resulting value of the object (product), $Y0$ is the associated resulting value.
Grouping the cost of all the partially used resources, we obtain the second component of the equation:

$$\sum_{j=1}^{n} Vfaj \qquad (6)$$

where by the equation with the second component takes the form:

$$\sum_{i=1}^{n} Vwci + \sum_{j=1}^{n} Vfaj + X2 = V' + Y0 \qquad (7)$$

Generation of value added that occurs as a result of physicochemical, informational and other resource transformations is normally initiated and carried out by informational elements of the value formation process, such as intangible assets, personnel qualification, and technology and innovation components. This generation is inseparable from the process of forming the value of an object (product) as such.
The elements that generate value added can be used, either fully or partially, thereby transferring their value to the object accordingly. This value transfer must be taken into account in the first and second components of the equation.
It should be noted that the elements of the process that generate value added often offer the property of increasing their own value (generating their own added value) as a result of their use. Some examples of those possessing such property may be personnel qualification, technology, innovation, and some types of intangible assets.

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Designating the generated added value of the object (product) as $Vaddk$, we obtain a formula that takes it into account during the object (product) value formation:

$$Vaddk + X3 = V' + Y0, \qquad (8)$$

where $Vaddk$ is the value added by the k-th generating element, $X3$ is the other cost components, V' is the resulting value of the object (product), $Y0$ is the associated resulting value.

By grouping the value added by all the generating elements, we obtain the third component of the equation:

$$\sum_{k=1}^{n} Vaddk \qquad (9)$$

and the equation with the third component takes the form:

$$\sum_{i=1}^{n} Vwci + \sum_{j=1}^{n} Vfaj + \sum_{k=1}^{n} Vaddk + X4 = V' + Y0 \qquad (10)$$

Obviously, the associated resulting value $Y0$ similarly to X can be divided into inherent value added of the resources used $V'adr$, scrap value $V'w$, by-product value $V'bp$, and other associated resulting value $Y1$.

Thus, the object (product) value formation equation can be represented as:

$$\sum_{i=1}^{n} Vwci + \sum_{j=1}^{n} Vfaj + \sum_{k=1}^{n} Vaddk = V' + V'adr + V'w + V'bp + Y1 \qquad (11)$$

The above equation fits into the framework of cost approaches to estimating the value of an object (product) and can be used in developing a statistical economic profile structure. However, it cannot claim to be an exhaustive description of value formation, since it must be solved in a system with an equation that would reflect income-based approaches to determining the value range of an object (product). We hope to consider the equation for income-based approaches to estimating an object (product) value in our further publications.

5. Summary

Thus, the article reflects the main features of methodological model of added value formation and update accounting in the field of biomedicine at different innovative product value creation stages –from an idea and its scientific development to commercialization at the state level (statistical accounting), aimed at information support for assessing the corporate and public value of innovation based on identifying the innovation value formation and update stages depending on its type. A model of statistical accounting for added value formation and update in the field of biomedicine as an innovative product value formation equation, which is based on the cost approach, has been developed. The proposed model is appropriate to use when developing a statistical economic profile structure.

References

Aichele, R.; Heiland, I. 2018. Where is the value added? Trade liberalization and production networks, *Journal of International Economics* 115: 130-144. https://doi.org/10.1016/j.jinteco.2018.09.002

Bentson, G. 1982. Accounting numbers and economic values, *Antitrust Bulletin* 27: 161-215.

Chiwamit, P.; Modell, S.; Scapens, R. W. 2017. Regulation and adaptation of management accounting innovations: The case of economic value added in Thai state-owned enterprises, *Management Accounting Research* 37: 30-48. https://doi.org/10.1016/j.mar.2017.03.001

Detournay, B.; Borel, T.; Trancart, M.; Emery, C. 2018. Clinical added value of drugs: An empirical survey of French transparency committee opinions, *Thérapie* 2: 215-226. http://dx.doi.org/10.1016/j.therap.2018.10.004

Drucker, P.F. 2003. *Management challenges for the 21st century.* Moscow: Published by Publishing House «Williams».

Frederick, S.; Gereffi, G. 2009. *Value chain governance.* Washington, DC: United States Agency for International Development.

Frolov, A.; Maslova, I. 2017. Subject-independent modeling and representation data on the formation and distribution of innovative value, *MATEC Web of Conferences* 132: 04019. https://doi.org/10.1051/matecconf/201713204019

González, R.; Julve, V. M.; Bargues, J. M. 2018. Towards convergence of government financial statistics and accounting in Europe at central and local levels, *Revistade Contabilidad-Spanish Accounting Review* 21(2): 140-149. https://doi.org/10.1016/j.rcsar.2017.10.001

Kersan-Škabić, I. 2017. Trade in value added (TiVA) in EU new member states (EU NMS), *Croatian Economic Survey* 19(2): 105-133. https://doi.org/10.15179/ces.19.2.4

Kleyner, G. B. 1986. *Production functions: theory, methods, application.* Moscow: Published by Finance and Statistics.

Korostelkina, I. A.; Popova, L. V.; Dedkova, E. G. 2018. Study of the modern paradigm of innovative development of the national economy, *Herald of Omsk University. Series «Economics»* 4: 44-56. http://dx.doi.org/10.25513/1812-3988.2018.4.44-56

Koval, V.; Duginets, G.; Plekhanova, O.; Antonov, A.; Petrova, M. 2019. On the supranational and national level of global value chain management, *Entrepreneurship and Sustainability Issues* 6(4): 1922-1937. http://doi.org/10.9770/jesi.2019.6.4(27)

Luehrman, T. A. 1997. What's it worth? A general manager's guide to valuation, *Harvard Business Review* 75: 132-142.

Marenkov, N. L. 2006. Methodological basis of innovative product valuation, *Audit and Financial Analysis* 1: 159-162. Retrieved from http://auditfin.com/fin/2006/1/Marenkov/Marenkov%20.pdf

Market Watch. 2014. Retrieved from https://www.marketwatch.com

Popova, L.; Maslova, I.; Korostelkina, I.; Dedkova, E. G; Maslov, B. 2019. Value formation of innovative product: From idea to commercialization, *Advances in Intelligent Systems and Computing* 850: 331-338.

Public analytical report on the scientific-technological direction «Biomedicine». 2015. Retrieved from https://reestr.extech.ru/docs/analytic/reports/medicine.pdf

Pulic, A. 2000. VAIC - an accounting tool for IC management, *International Journal of Technology Management* 20: 702-714. http://dx.doi.org/10.1504/IJTM.2000.002891

Rozhkova, N. K.; Kutyleva, N. M. 2014. The main approaches to the evaluation of the value of innovative product, *Bulletin of the University* 15: 143-148.

Schumpeter, J. A. 1989. *History of economic analysis.* Moscow: Published by Economics. Retrieved from http://www.urbanlab.org/articles/economics/Schumpeter%201954%20-%20history%20economic%20analysis.pdf

Tvaronavičienė, M. 2019. Insights into global trends of capital flows' peculiarities: emerging leadership of China, *Administratie si Management Public* (32): 6-17. http://doi.org/10.24818/amp/2019.32-01

Udpa, S. 1996. Activity-based costing for hospitals, *Health Care Management Review* 21(3): 83-96. http://dx.doi.org/10.1097/00004010-199622000-00009

Vorotnikov, I. L.; Sukhanova, I. F.; Lyavina, M. Y.; Glukhova, M. I.; Petrov, K. A. 2019. Economic sanctions and import substitution, *Entrepreneurship and Sustainability Issues* 6(4): 1872-1883. http://doi.org/10.9770/jesi.2019.6.4(23)

Wesseler, J.; Von Braun, J. 2017. Measuring the bioeconomy: Economics and policies, *Annual Review of Resource Economics* 9: 275-298. https://doi.org/10.1146/annurev-resource-100516-053701

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MATHEMATICAL MODEL OF OPTIMIZING THE BALANCE SHEET STRUCTURE OF THE RUSSIAN BANKING SYSTEM WITH ALLOWANCE FOR THE FOREIGN EXCHANGE RISK LEVELS

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Abstract. Under present-day conditions of significant national currency fluctuations in the Russian Federation, a search for effective methods of foreign exchange risk management in the banking system is being updated. In this regard, development of a mathematical model for optimizing the asset and liability structure in Russian banks with allowance for the foreign exchange risk was the goal of the research. Using a method of regression analysis, a mathematical model has been developed to optimize the balance sheet structure of the banking system based on determining the dependence of net profit on asset and liability figures of the balance sheet, whereby the profit and profitability of banking in foreign currency is maximized. This mathematical optimization model was based on the permissible foreign exchange risk level standards in banking. Statutory financial reporting data of the Russian banking system in the aggregate denominated in foreign exchange (in ruble equivalent) for the period from 01.10.2010 to 01.02.2019 and disaggregated by months were used. The model results for the last three years were compared with the actual data. The model results can help optimize efficient allocation of resources and improve banking foreign exchange risk management policies.

Keywords: asset-liability management; foreign exchange risk; foreign currency; ideal planning; modeling, banking system

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JEL Classifications: G21, G32, F31, O24

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1. Introduction

Today, banks play a crucial role in the national economy as financial intermediaries. Not only the financial system's reliability but also the national economic stability as a whole depends on the level of their financial sustainability and operational efficiency (Halim et al., 2015; Saksonova, 2013; Chunikhin et al., 2019; Kunitsyna et al., 2018). In this regard, the key objective of banking institutions is not only to assess potential risks but also to form a respective mechanism to counteract their negative impact. Being a large and complex system with a huge number of variables, various factors and relationships, financial risk analysis requires quite complex, well-advanced mathematical methods, statistical data processing methods, numerical methods, and computer tools (Mehri & Jamshidinavid, 2015; Mohammadi & Sherafati, 2015; Teresienė, 2018; Oleksyk, 2018; Tvaronavičienė et al., 2018; Hilkevics, Semakina, 2019). One of the risks that have adversely affected the financial performance and, consequently, the sustainability of the Russian banking institutions within the specified periods is the foreign exchange risk. In downturns, the exchange rate volatility has sharply increased. Thus, in early 2009, the dollar rose by 48% compared to the Russian ruble from the same period a year earlier, while in January 2015 the dollar grew by 72% compared to 2014. Starting from late 2008 and for much of 2009, the banking system demonstrated a violation of a foreign exchange position standard, the maximum value of which was observed in January 2009–34.6% (at a normal rate of no more than 20%), which indicates a high foreign exchange risk. The ruble weakening was observed throughout 2015, and in early 2016 the dollar rose further by 28.3% compared to 2015, while as of 1 January 2019, the dollar grew by 21.7% compared with the same period a year earlier (The Central Bank of the Russian Federation, 2019a). It should be noted that many countries have faced foreign exchange risks in recent decades. Moreover, the situation is constantly exacerbated by intensified globalization processes. For example, in 2018 the Turkish lira fell by more than 40%, which, according to Goldman Sachs' analysts, would significantly reduce supplementary capital of banks because the value of their own capital in the national currency was decreasing compared to foreign currency loans while the banks still had to repay the foreign currency debts in the amount of 76 billion dollars (Pitel & Arnold, 2018). In Russia, the International Monetary Fund (IMF) experts have identified two currency crises–in 1998 and in 2014 (Laeven & Valencia, 2018).

The current situation necessitates further study of the theoretical and practical foundations for the formation of a risk management system to manage foreign exchange risks in lending institutions based on mathematical modeling, since the existing methods have proved to be inconsistent (Agarana et al., 2014; Bolotov, 2013a, 2013b). One way to solve the problem of foreign exchange risk management can be development of mathematical tools to control bank assets and liabilities, including a foreign currency component. In the most general terms, asset and liability management represents planning of assets and liabilities according to different requirements and the bank management objectives via consolidated balance sheets (a balance method). Asset and Liability Management (ALM) shows the relationship between risk and bank profitability. All financial decisions of a bank are reflected on the balance sheet, which makes it possible to evaluate their effectiveness and risk level (Alhumaidah, 2015; Umarova & Idirisova, 2015). Asset and liability management strategy refers to mathematical planning that includes various constraints in the form of mathematical equations and takes into account all the relationships between phenomena that must be balanced (Mehrabi, 2014). Recently, in addition to maximizing profits, banking institutions have had to solve problems related to risks, liquidity, social issues, etc. In such cases, researchers recommend using multi-criteria decision-making models, such as a goal-oriented programming model as a multi-criteria decision making model (Khalili, 2007; Izadi et al., 2012; Azizi & Neisy, 2017). Having regard to the above, development of a mathematical model to optimize the balance sheet structure of the Russian banking system with allowance for the specified level of foreign exchange risk is the major goal of this research. In the furtherance of this goal, the ratios between balance sheet items in the form of financial ratios were primarily determined and then, using a nonlinear programming method, optimal plan (ideal) indicators of the balance sheet structure were calculated.

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2. Literature review

In the development of global banking and financial activity, the question of how to manage foreign exchange risks in banking institutions has always been regarded as an important issue because the operation of financial institutions is closely linked to conducting significant quantities of foreign exchange transactions. Today, the banking arsenal avails of the following foreign exchange risk management practices: foreign exchange position management, hedging by means of derivative contracts, Value-at-Risk (VAR) methods, and currency matching. Each of the reviewed management methods has disadvantages: the possibility of breaching risk hedging contracts in the event of a crisis, the need for large amounts of data and complex calculations according to the VAR methods, analysis of foreign exchange position as a whole in terms of total assets and liabilities of a bank rather than on an item by item basis, etc. At the same time, the asset and liability management method to manage foreign exchange risks by means of optimizing the balance sheet structure denominated in foreign currency has not been reflected in the current scientific literature.

A number of authors (Alizadeh et al., 2016; Izadi et al., 2012; Ebrahimi, 2010; Islami et al., 2011; Arewa et al., 2013; Khazri et al., 2018; Dudka, 2006; Umarova & Idirisova, 2015) in their studies used the asset and liability management method to identify an optimal structure of a bank balance sheet, taking into account different objectives. Thus, using the ALM method and an ideal scheduling model, Alizadeh et al. (2016) optimized bank balance sheet structures through case studies of five banks in order to maximize profits and taking into account the balance sheet risk. In turn, Izadi et al. (2012), using multi-purpose decision-making techniques, made an attempt to optimize balance sheets of commercial banks to maximize the shareholders' wealth. The research results have shown that all the anticipated goals for market risk and deviations from the planned values were fully achieved, with the exception of market risk that was zero. Using a method of hierarchical analysis of an ideal scheduling model for asset and liability management, Ebrahimi (2010) optimized the balance sheet structure of Tejarat bank in accordance with goals such as capital adequacy and liquidity level maximization. In their study, Islami et al. (2011) show that by means of an ideal scheduling model, a bank balance sheet can be structured so that so that it will improve the bank's resource distribution efficiency. Khazri et al. (2018), through the case study of an Iranian bank, using fuzzy hierarchical analysis in conjunction with the ideal scheduling model structured the balance taking into account structural and ideological constraints, as well as legal requirements. The results obtained contribute to a more efficient allocation of bank resources. Dudka (2006) developed a complete asset and liability management model through the case study of a Russian bank, mainly aimed at building such a bank asset and liability structure that would contribute to an increase in the bank's net interest margin. Umarova and Idirisova (2015) in their study suggest optimizing a bank balance sheet, taking into account off-balance assets and liabilities; they also come to the conclusion that banks should make allowance for risks when managing their assets and liabilities but they should never build their strategy on interest rate estimates. Arewa et al. (2013) propose an optimal structure of a bank balance sheet with allowance for the liquidity risk using the ideal scheduling method through the case study of United Bank for Africa (UBA). Alhumaidah (2015) developed two optimization models for the central bank of Saudi Arabia, taking into account an outflow of reserves. Saksonova (2013) proposes to optimize the structure of assets and liabilities through the case studies of Latvian banks to ensure operation profitability and minimize the interest rate risks. Thus, according to the analysis of literary sources, the balance method is the most acceptable method to control assets and liabilities.

3. Materials and methods

This study is a practical research that has analyzed the existing part of balance sheet structure of the banking system in the Russian Federation, denominated in foreign currency (in ruble equivalent) and proposed a mathematical model of its optimal structure. The restrictions and requirements presented in the model were developed with due consideration to the opinions of experts and rating agencies (Moody's Investors Service, 2009; Karkowska, 2014; Asian Development Bank, 2015; Xu et al., 2019; Azizi & Neisy, 2017) who dealt with

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the issues of assessing risk management and financial stability of the banks and suggested recommended values for a number of balance sheet item relationships, as well as on the basis of regulatory requirements established by the Central Bank of Russia (The Central Bank of the Russian Federation, 2017).

The study used statutory financial reporting data from the Russian banking system as a whole, foreign currency denominated (in ruble equivalent) for the period from 01.10.2010 to 02.01.2019, disaggregated by months. The data for the study were derived from the official website of the Bank of Russia (The Central Bank of the Russian Federation, 2019b). A reference data sample is presented in Table 1.

Table 1. Initial data sample of the banking system balance sheet denominated in foreign currency (in ruble equivalent)

Balance sheet items	1/1/11	1/1/13	1/1/15	1/1/17	1/1/19
Foreign currency assets (in ruble equivalent)					
Cash, precious metals and stones	191	314	1,063	520	1,025
Accounts with the Bank of Russia and other authorized bodies	1	5	513	1	0
Correspondent accounts with lending institutions	714	1,259	2,246	1,463	1,513
Securities acquired by lending institutions	950	1,276	2,814	3,541	3 174
Other equity holding	1	4	0	0	0
Derivative financial instruments	0	0	0	0	0
Credits and other loans, total	6,062	7,231	15,411	15,900	14,574
of them: debt in arrears	299	268	502	576	654
Fixed assets, other real estate, intangible assets and inventories	0	0	0	0	2
Disposition of profits	0	0	0	0	0
Other assets, total	225	321	1,245	809	823
Total assets in foreign currency	8,144	10,410	23,292	22,234	21,112
Liabilities in foreign currency (in ruble equivalent)					
Funds and profits of lending institutions, total (owner's equity)	0	0	0	0	0
Credits, deposits and other external funds received by lending institutions from the Bank of Russia	0	0	1,281	689	0
Accounts of lending institutions, total	74	133	395	426	441
Loans, deposits and other funds received from other lending institutions, total	1,923	2,208	3,371	3,183	2,552
Customer funds, total	5,364	7,275	15,855	16,041	16,944
Of these, funds in current accounts	869	1,088	2,207	2,313	2,925
wholesale and retail deposits	4 394	6,017	13,382	13,579	13,867
Bonds	0	0	0	0	25
Promissory notes and banking acceptances	127	421	379	128	90
Derivative financial instruments	0	0	0	0	0
Other liabilities, total	202	306	1,222	749	772
Total liabilities in foreign currency	7,690	10,344	22,503	21,241	20,824

Source: The Central Bank of the Russian Federation, 2019b

To determine optimal plan (ideal) indicators of the balance sheet structure, it is proposed to apply one of the most reliable non-linear programming methods–a non-linear generalized down-gradient method built into the package "Search for Solution" in MS Excel (Standard Excel solver - limitations of nonlinear optimization, 2019). Gradient

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methods allow one to find a solution to any smooth nonlinear programming problem in the general case. A disadvantage of these methods is seeking local extremums, not global ones. However, since the search for optimal values of indicators must be carried out in the vicinity of actual indicator values, this problem is removed in the framework of this study.

The final stage of the study involves comparison of the optimal and real (actual) indicators of the balance sheet structure, which would improve the decision-making quality.

As noted previously, it is proposed to use the total profit maximization of the banking system as a decision optimality criterion. To build this criterion function, a method of correlation and regression analysis should be used. A multiple linear regression model of dependence of the banking system's total profit on the indicators of a balance sheet structure denominated in foreign currency is written as:

$$Z = a_0 + \sum_{i=1}^{m} a_i X_i + \sum_{j=1}^{n} b_j Y_j, \qquad (1)$$

where Z is net profit, billion rubles; X_i are asset figures in foreign currency, billion rubles, Y_j are liability figures in foreign currency, billion rubles, a_0, a_i, b_j are unknown model parameters.

Stimulants that contribute to increasing bank profits are such balance sheet asset items as securities, loan portfolio, derivative financial instruments, and correspondent accounts with lending institutions. Disposable funds and accounts with the Bank of Russia contribute to an expansion of liquidity; they have no effect on a decline in profits. However, their substantial amount may have an effect of lost profit because the money is kept in the accounts while it could be invested in income-earning assets. All the liability items (except for the item "accounts of lending institutions") are disincentives that reduce the profits. Funds in current accounts and bonds are cheaper resources that, consequently, have a smaller negative impact on profits.

This model was developed using the "Regression" function built into the "Analysis Package" in MS Excel. This function determines unknown parameters of the linear model based on a least squares method, as well as a wide range of statistical measures allowing for evaluation of the developed model quality. When constructing a regression and studying the interrelationships of the observed values of both types of variables, muticollinearity was not studied due to the following considerations:

1) the importance of variables for assessing the balance and a complete macroeconomic picture, as well as the list of the banking system controls with allowance for the foreign exchange risk;
2) the purpose of the article was not to obtain a connection between the observed values of variables and its comprehensive study, but to study and explore balance sheet variables, to control the main balancing variables, and to optimize the criterion function.

To develop a balance sheet optimization model taking into account the currency component, the following notation for determining the balance sheet structure of the banking system was introduced (Table 2).

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Table 2. Indicator notations in the balance sheet structure of the banking system

Variable	Indicator	Variable	Indicator
X1	Cash, precious metals and stones, total	Y1	Credits, deposits and other external funds received by lending institutions from the Bank of Russia
X2	Accounts with the Bank of Russia and other authorized bodies	Y2	Accounts of lending institutions, total
X3	Correspondent accounts with lending institutions, total	Y3	Loans, deposits and other funds received from other lending institutions, total
X4	Securities acquired by lending institutions, total	Y4	Customer funds, total
X5	Credits and other loans, total	Y5	Of these, funds in current accounts
		Y6	wholesale and retail deposits
X6	of them: debt in arrears	Y7	Promissory notes and banking acceptances
X7	Other assets, total	Y8	Other liabilities, total
X8	Total assets in foreign currency	Y9	Total liabilities in foreign currency

The choice of the list, type and values of model variables is fully determined by the structure of actual balance sheets in the banking system with regard to requirements of the Bank of Russia for a maximum size of the foreign exchange position (no more than 20%) in order to develop effective tools for managing assets and liabilities in foreign currency. Part of the variables was excluded from the model due to their degeneracy. Thus, as can be seen from Table 2, there are no indicators such as: “other equity holding”; “derivative financial instruments”; “fixed assets, other real estate, intangible assets, and inventories”; and “disposition of profits” among the asset indicators in foreign currency. Among the liability indicators in foreign currency, there are no indicators such as: “owner’s equity”, “bonds”; “promissory notes and banking acceptances”. This is due to the fact that the value of these indicators was constant (or quasi-constant) and tended to zero throughout the study period from 01.10.2010 to 02.02.2019. As for the indicator “owner’s equity”, in accordance with the requirements of the Central Bank of Russia, it should be formed only in national currency; therefore, its values were equal to zero in the balance section reflecting foreign exchange operations.

Features of the subject area and strength of financial indicators’ relationship within the banking system at the macroeconomic level imply the existence of linear and nonlinear links between balance variables. Most of these links are formalized and interpreted in the model as constraints, with some being considered isolated. The variables included in the calculation (balance ratio) of each other (for example, Y4 includes Y5 and Y6) are not excluded from the model because of the need to preserve invariance in the balance structure, as well as due to the fact that their inclusion does not defy the model logic.

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4. Results

An optimal balance sheet structure of the banking system with allowance for foreign exchange risk was determined on the basis of the following nonlinear optimization model in the form of maximum of a target function:

$$Z = -127{,}997 + 0{,}4253X1 - 0{,}1991X2 + 0{,}2970X3 + 0{,}1659X4 - 0{,}0408X5 - 0{,}1964X6 + 0{,}0278X7 - 0{,}2901Y1 + 0{,}0177Y2 - 0{,}2968Y3 + 1{,}9013Y4 - 2{,}4856Y5 - 1{,}8122Y6 - 0{,}9901Y7 - 0{,}5926Y8 \rightarrow \max \quad (2)$$

under conditions:

$$65 \leq \frac{X5}{X8} * 100 \leq 70 \quad (3)$$

$$\frac{X3 + X4 + X5 - X6 + X7}{X8} * 100 \geq 60 \quad (4)$$

$$\frac{X6}{X5} * 100 \leq 5 \quad (5)$$

$$\frac{X1 + X2 + X3}{X8} * 100 \geq 12 \quad (6)$$

$$1 \leq \frac{X5}{Y6} \leq 1.05 \quad (7)$$

$$5 \leq \frac{X1 + X2}{Y6} * 100 \leq 10 \quad (8)$$

$$\frac{X1 + X2 + X3}{Y5} * 100 \geq 50 \quad (9)$$

$$10 \leq \frac{X8 - Y9}{CK} * 100 \leq 20 \quad (10)$$

$$\frac{Y3}{Y9} * 100 \leq 20 \quad (11)$$

$$\frac{Y5}{Y9} * 100 \leq 30 \quad (12)$$

$$\frac{Y6}{Y9} * 100 \geq 50 \quad (13)$$

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$$Xi \geq 0, (i = \overline{1,8}) Yj \geq 0, (j = \overline{1,9}) \quad (14)$$

where Z is profit, billion rubles; CK is funds and profits of lending institutions (owner's equity), billion rubles.

To build the target function, the method of correlation and regression analysis was used based on the initial data on the balance sheets of the banking system for the period from 10.01.2010 to 02.01.2019 disaggregated by months (the sample size was 100 points).

The obtained multiple regression equation is adequate as evidenced by sufficiently high values of the coefficients of determination (0.6387) and multiple correlation (0.7992) and also statistically significant in general according to F-test (Fcalc = 9.9> Ftab (0.95; 15, 84) = 1.79).

Constraint (3) in the proposed model determines the ratio between the loan portfolio and assets ranging from 65 to 70%, as recommended by best banking practices.

Condition (4) restricts the ratio between operational assets and assets to at least 60%, as recommended by best banking practices.

Constraint (5) determines the share of nonperforming loans in the loan portfolio (no more than 5%), as recommended by banking experts.

Inequality (6) restricts the share of absolutely liquid assets to at least 12%, as recommended by world's experts.

Constraint (7) determines the desired ratio between loans and deposits at a level of no more than 1, as recommended by best banking practices.

Condition (8) limits the ratio between the sum of X1, X2 and deposits at a level of 5 to 10%.

Constraint (9) determines the ratio between liquid assets and funds in settlement accounts at no less than 50% in accordance with regulatory requirements for current liquidity ratio imposed by the Central bank of Russia.

Condition (10) establishes the foreign exchange position standard within a maximum of 20%, as required by the Central Bank of Russia.

Inequality (11) restricts the ratio between interbank loans and liabilities at a level of no more than 20%, as recommended by best banking practices.

Constraint (12) determines the share of funds in current accounts at no more than 30%, as recommended by best banking practices.

Constraint (13) determines the ratio between deposits and liabilities at a level of at least 50%, as recommended by best banking practices.

The value of owner's equity in this model is set as a priori information in the form of a constant (the actual value as of the date under study), since the owner's equity value is assumed to be an uncontrollable variable.

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Table 3 presents the results of practical application of the model to optimize the balance sheet structure of the Russian banking system and the actual values of respective indicators, as well as the foreign exchange risk standard.

Table 3. Optimization balance sheet structure of the banking system of the Russian Federation

	Indicator	1.01.19		1.01.18		1.01.17	
		Actual	Plan	Actual	Plan	Actual	Plan
X1	Cash, precious metals and stone, total	1,025	1,186	811	961	520	884
X2	Accounts with the Bank of Russia and other authorized bodies	0	0	1	2	1	4
X3	Correspondent accounts with lending institutions, total	1,513	1,674	1,026	1,117	1,463	1,608
X4	Securities acquired by lending institutions, total	3,174	3,861	3,115	2,674	3,541	3,661
X5	Credits and other loans, total	14,574	13,980	13,393	13,426	15,900	15,245
X6	of them: debt in arrears	654	699	594	671	576	762
X7	Other assets, total	823	807	654	1,000	809	798
X8	Total assets in foreign currency	21,112	21,508	19,000	19,180	22,234	22,200
Y1	Credits, deposits and other external funds received by lending institutions from the Bank of Russia	0	0	0	0	689	542
Y2	Accounts of lending organizations, total	441	400	337	388	426	424
Y3	Loans, deposits and other funds received from other lending institutions, total	2,552	2,634	2,689	2,706	3,183	3,420
Y4	Customer funds, total	16,944	17,028	14,863	14,964	16,041	16,436
Y5	Of these, funds in current accounts	2,925	2,328	2,431	2,328	2,313	2,412
Y6	wholesale and retail deposits	13,867	13,314	12,292	12,487	13,579	13,859
Y7	Promissory notes and banking acceptances	90	84	93	91	128	121
Y8	Other liabilities, total	772	763	595	763	749	763
Y9	Total liabilities in foreign currency	20,824	20,909	18,579	18,912	21,241	21,706
	Foreign exchange position standard (no more than 20%)	3.1	6.4	4.7	3.0	11.5	5.7

The expected and actual net profit margins as well as return on assets as a result of the mathematical model of optimizing the balance sheet structure of the banking system denominated in foreign currency are shown in Fig. 1.

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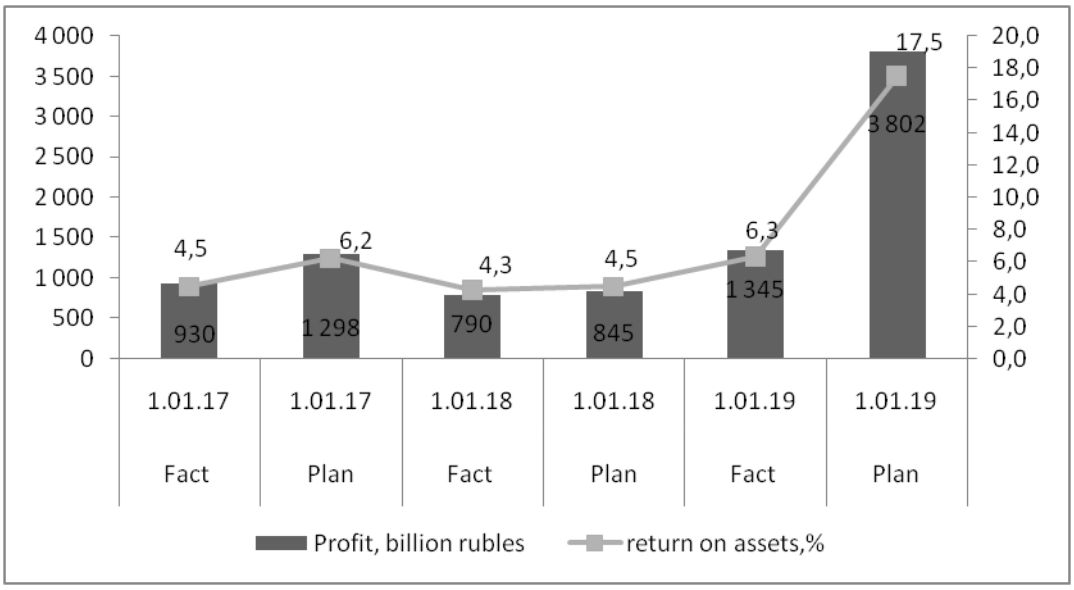

Fig. 1. Expected and actual profit and return on assets of the banking system

5. Discussion

The results obtained through the case study during the last three years (from 01.01.2017 to 01.01.2019) indicate that banks could increase the amount of assets and liabilities in foreign currency, which would have a positive effect on the banking system profits. Also, in the optimal model, the banking system liquidity levels would improve due to an increase in cash resources and cash equivalents, as well as the amount in correspondent accounts with other banks as of 01.01.2019 and 01.01.2017. In this event, the loan portfolio size in the planned balance is slightly reduced as of 01.01.2019 and 01.01.2017, while profits increase due to a growing securities portfolio during these periods. In turn, the amount of funds in the optimal balance liabilities as of 01.01.2019 and 01.01.2018 in current accounts that are unstable resources and can be withdrawn at any time is declining. A decreased deposit portfolio of legal entities and individuals as of January 1, 2019 compared to the actual values would have allowed banks to increase their income by reducing the cost of interest on deposits. According to the research results, it can be seen from Fig. 1 that the expected profit and return on assets at the optimal structure of the balance sheet in a foreign currency is significantly higher than that actually received. Also, the levels of foreign exchange risk (the foreign exchange position standard) in 2017-2018 in the planning periods decrease and remain within the normal range in 2019 despite some growth. It is important to note that the increase in assets and liabilities in foreign currency as of 01.01.2019 has affected a growth in the foreign exchange position by 3.5 percentage points (up to 6.4%) and in the return on assets–by 11.2 percentage points (to 17.5%). Such a significant increase in the expected profit and return on assets in 2019 was determined by a plummeting of the dollar exchange rate by 21.7% compared with the previous year (The Central Bank of the Russian Federation, 2019a). In other words, a controlled foreign exchange risk when the dollar keeps rising can improve the profitability of banking institutions. Thus, optimization of the balance sheet in the Russian banking system, denominated in foreign exchange, would maximize profits at a controlled level of currency exposure, which indicates that the goal of research has been achieved.

The point of the study was an attempt made to optimize the balance sheet structure, firstly, at the macro level (using the example of the banking system as a whole) and, secondly, only in the part of the banking system balance that reflects foreign currency transactions. All the previous studies discussed in Literature review had mainly affected the micro-level (individual banking institutions) and did not consider the foreign exchange risk management. Unfortunately, the paper does not consider the possibility of optimizing the structure of assets and

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liabilities of the banking system, expressed in foreign currency, in a downturn. This, in our opinion, should serve as a line of further research on this subject.

The results of the study may find practical use in improving the foreign exchange risk management policies at the level of banking system, pursued by the Central Bank of Russia. Optimization of the balance sheet structure of the banking system, taking into account then foreign exchange risk, would allow for maximization of profits in the context of currency rate volatility that has recently become more frequent and would reduce the number of unprofitable banks. The proposed approach to optimizing the balance sheet structure through the cases study of the banking system can also be adapted for individual banking institutions.

Conclusion

In this study, a mathematical model was developed to optimize the balance sheet structure of the Russian banking system. The model presented in the framework of this study has made it possible to determine such a structure of assets in the banking system and portfolio of liabilities that would help to ensure a controlled foreign exchange risk dimension with an increase in the dollar exchange rate. Practical implementation of the developed mathematical model to optimize the balance sheet structure allows one to identify a level of plan indicators in the balance sheet structure that would ensure excess of the actual level of bank financial stability indicators: profit and return on assets. The proposed approach is an effective and universal tool for managing foreign exchange risks in the Russian banking system and for developing timely preventive measures to reduce them in the framework of the tactical and strategic banking activities. Also, this mathematical optimization model can be used as a tool for monitoring and assessing bank performance efficiency. Some major advantages of this approach are dynamic programming and the possibility to use various constraints for structural balance sheet indicators in compliance with modern requirements for financial security of banking institutions and increasing the correlation between balance sheet items. The proposed mathematical model for optimizing the balance sheet structure can serve as a guide for the Central Bank of Russia in decision-making and developing strategies in various economic circumstances. In addition, the proposed approach can serve as a tool for individual banking institutions used to plan a bank's future development strategy.

References

Agarana, M. C.; Bishop, S. A.; Odetunmibi, O. A. 2014. Optimization of banks loan portfolio management using goal programming technique, *International Journal of Research in Applied, Natural, Social Sciences* 2(8): 43-52.

Alhumaidah, F. 2015. Asset-liability management for reserves under liquidity constraints: The case of Saudi Arabia, *Procedia Economics and Finance* 29: 17-40. https://doi.org/10.1016/S2212-5671(15)01112-0

Alizadeh, M.; Asadi, A.; David, A. R. 2016. Fuzzy optimization. *The 8th International Conference of Iranian Operations Research Society*, Mashhad, Iran. Mashhad: Ferdowsi University of Mashhad.

Arewa, A.; Owoputi, J. A.; Torbira, L. L. 2013. Financial statement management, liability reduction and asset accumulation: An application of goal programming model to a Nigerian bank, *International Journal of Financial Research* 4(4): 83-90. https://doi.org/10.5430/ijfr.v4n4p83

Asian Development Bank. 2015. Financial soundness indicators for financial sector stability. A tale of three Asian countries. Retrieved from https://www.adb.org/sites/default/files/publication/173687/fsi-3-asian-countries.pdf

Azizi, S.; Neisy, A. 2017. Mathematic modelling and optimization of bank asset and liability by using fractional goal programing approach, *International Journal of Modeling and Optimization* 7(2): 85-91. http://dx.doi.org/10.7763/IJMO.2017.V7.564

Bolotov, D. 2013a. Implementation model of the automatic generation the final amount of commissions in international banking payments, *Journal of Contemporary Economics Issues* 1. https://doi.org/10.24194/11306

Bolotov, D. 2013b. Methodical approaches to determination of economic effect of using optimization models to reduce the costs of implementing international bank transfers, *Journal of Contemporary Economics Issues* 3. https://doi.org/10.24194/31303

Chunikhin, S. A.; Kuzmin, E. A.; Pushkareva, L. V. 2019. Studying the banking industry's stability through market concentration indices, *Entrepreneurship and Sustainability Issues* 6(4): 1663-1679. http://doi.org/10.9770/jesi.2019.6.4(8)

Dudka, A. B. 2006. Approaches to managing the structure of assets and liabilities of a commercial bank, *Herald of Omsk University. Series "Economics"* 2: 132-137. Retrieved from https://cyberleninka.ru/search?q=%D0%94%D1%83%D0%B4%D0%BA%D0%B0%20%D0%90.%D0%91

Ebrahimi, M. 2010. *Mathematical modeling asset management in commercial bank debt using goal programming.* Tehran: Published by University of Al-Zahra, 365p.

Halim, B. A.; Karim, H. A.; Fahami, N. A.; Mahad, N. F.; Nordin, S. K. S.; Hassan, N. 2015. Bank financial statement management using a goal programming model, *Procedia - Social and Behavioral Sciences* 211: 498-504. https://doi.org/10.1016/j.sbspro.2015.11.066

Hilkevics, S.; Semakina, V. 2019. The classification and comparison of business ratios analysis methods, *Insights into Regional Development* 1(1): 48-57. https://doi.org/10.9770/ird.2019.1.1(4)

Islami, B. G.; Mehregan, M; Gholami, P. 2011. Optimal management of assets in banks using fuzzy hierarchical analysis and planning, *Quarterly Financial Engineering and Management Portfolios* 9: 23-44.

Izadi, N. N.; Ghandahar, M.; Abedini, A.; Moradi A. 2012. Capital adequacy ratios as a function function in modeling asset and liability management of banks (Case study: Tejarat Bank), *Journal of Accounting and Financial Management* 9: 130-152.

Karkowska, R. (Ed.). 2014. *Challenges to financial stability – perspective, models and policies.* Craiova: Published by ASERS Publishing.

Khalili, I. M. 2007. Best optimal stock selection using goal programming, *Economics Bulletin* 6: 37-64.

Khazri, B. S.; Dehghan, A.; Aslizadeh, A. 2018. Design and optimization of the asset and liability model based on the multiple-objective decision-making view, *Industrial Engineering & Management Systems* 17(2): 311-317. https://doi.org/10.7232/iems.2018.17.2.311

Kunitsyna, N.; Britchenko, I.; Kunitsyn, I. 2018. Reputational risks, value of losses and financial sustainability of commercial banks, *Entrepreneurship and* Sustainability *Issues* 5(4): 943-955. http://doi.org/10.9770/jesi.2018.5.4(17)

Laeven, L.; Valencia, F. 2018, September 14. Systemic banking crises revisited. *International Monetary Fund,* Retrieved from https://www.imf.org/en/Publications/WP/Issues/2018/09/14/Systemic-Banking-Crises-Revisited-46232

Mehrabi, L. 2014. Asset-liability management in Islamic banks, *The Central Banks Quarterly* 4: 127-144.

Mehri, M.; Jamshidinavid, B. 2015. Designing a mathematical model of asset and liability management using goal programming (Case study: Eghtesad-e- Novin Bank), *GMP Review* 18(3): 186-195.

Mohammadi, R.; Sherafati, M. 2015. Optimization of bank liquidity management using goal programming and fuzzy AHP, *Research Journal of Recent Sciences* 4(6): 53-61. Retrieved from http://www.isca.in/rjrs/archive/v4/i6/9.ISCA-RJRS-2014-226.pdf

Moody's Investors Service. 2009. Moody's rating symbols & definitions. Retrieved from https://www.moodys.com/sites/products/productattachments/2007100000528403.pdf

Oleksyk, P. 2018. Financial Reporting Analyses in Preparation of Dividend Payments in Polish Banks, *Transformations in Business & Economics* 17, 2A (44A): 309-324.

Pitel, L.; Arnold, M. 2018. Turkish business feels the pain of currency crisis. Lira's tumble hits companies that borrowed in euros and dollars for years. *Financial Times,* Retrieved from https://www.ft.com/content/0661a1b0-9f08-11e8-85da-eeb7a9ce36e4

Saksonova, S. 2013. Approaches to improving asset structure management in commercial banks, *Procedia - Social and Behavioral Sciences* 99: 877-885. https://doi.org/10.1016/j.sbspro.2013.10.560

Standard Excel solver - limitations of nonlinear optimization. 2019. *Frontline Solvers,* Retrieved from https://www.solver.com/standard-excel-solver-limitations-nonlinear-optimization

Teresienė, D. 2018. Performance measurement issues in central banks, *Entrepreneurship and Sustainability Issues* 6(1): 176-189. http://doi.org/10.9770/jesi.2018.6.1(12)

The Central Bank of the Russian Federation. 2017, June 28. Bank of Russia instruction No. 180-I "On mandatory bank standards". Retrieved from http://base.garant.ru/71721584/#ixzz5oyRM3S30

The Central Bank of the Russian Federation. 2019a. Currency exchange rate database. Retrieved from http://www.cbr.ru/currency_base/

The Central Bank of the Russian Federation. 2019b. Performance indicators of credit institutions. Retrieved from https://www.cbr.ru/Content/Document/File/48169/bsr_2008.pdf

Tvaronavičienė, M.; Masood, O.; Javaria, K. 2018. Preconditions of the Eurozone economic security: how to overcome liquidity risk and cost inefficiency in leading banks of UK and Germany, *Polish Journal of Management Studies* 18(1): 418-427. http://doi.org/10.17512/pjms.2018.18.1.31

Umarova, K. A.; Idirisova, A. T. 2015. Asset and liability management at a commercial bank, *Innovative Science* 5: 110-113. Retrieved from https://cyberleninka.ru/article/n/upravlenie-aktivami-i-passivami-v-kommercheskom-banke

Xu, T. T.; Hu, K.; Das, U. S. 2019, January 11. Bank profitability and financial stability. *International Monetary Fund,* Retrieved from https://www.imf.org/en/Publications/WP/Issues/2019/01/11/Bank-Profitability-and-Financial-Stability-46470

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EVALUATION OF REGIONAL INNOVATION SYSTEMS PERFORMANCE USING DATA ENVELOPMENT ANALYSIS (DEA)

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Abstract. Effective innovative systems testify to the success of regional economic policies. Based on the neoclassical approach novel approach towards evalution of regional innovation system functioning is suggested. In this study, the performance indicators of innovative systems in the regions of Kazakhstan are calculated using the non-parametric Data Envelopment Analysis (DEA) method for a convex model, with constant and variable effects of scale, focused on maximum outputs and minimum resource costs. The obtained results will facilitate providing recommendations for improving economic policy for the purposes of more efficient use of resources in regional innovation activities.

Keywords: regional innovation development, Kazakhstan, efficiency of innovation systems, non-parametric optimization, Data Envelopment Analysis (DEA).

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1. Introduction

Innovation is a basis of any modern economy and in any country including the development of innovative ideas, the creation of innovative technologies, launching of innovative products and services. The innovative basis of the economy allows to compete on the inter-regional, central and global markets. The wealth of experience has been gained in creating innovation systems at the country level and alliances/collaborations at the regional level in countries with established market economies. The system of methods for analysing the effectiveness of innovation activities of both individual enterprises and the regions as a whole has been developed and various measures are used to increase the use of resources for creating innovation. The countries with new economies are in different situation. One of them is the Republic of Kazakhstan. Despite the fact that according to the data of the Kazakhstan Statistics Agency, the GDP forthe last 8 years has increased 2.4 times since 2010 and 2017 (or 243.41%), and the growth in the volume of innovative products produced is almost 6 times (or 594.19) %), the share of innovative products in the total volume of GDP has changed slightly from 0.65% to 1.59%. This level of growth is not sufficient to achieve the goal set by the President of Kazakhstan: to enter in the top 50 countries with developed economies. There is potential for achieving the goal: there are about 500 deposits with 1225 kinds of minerals in the country. It is about Kazakhstan known, that 99 elements can be mined out of 126 periodic table elements. Currently, the economy of Kazakhstan has a predominantly commodity profile and the main task is to diversify the economy, transfer it to an innovative industrial profile. Considering the large territory (9th place in the world by area of the country) and low population density (average density of just over 6.72 people per 1 square km), the role of regional centres is increasing not only as administrative centres, but also as centres of culture and innovation. The innovation of the region is the ability of the entire regional environment to adapt changes, as well as the presence of internal drivers of self-renewal of business processes and the generation of scientific and technical knowledge.

Sustainable development of the region and maintaining its competitiveness in the long term depends not only on resource capabilities (the so-called factors of the first nature), but on agglomeration effects, modernization and informatization processes, human capital (that is, factors of the second nature).

Unlike natural resources, the distribution of which across regions is impossible to change, the formation of factors of a second nature of the desired quality is a controlled process. In this regard, it is relevant to study the level of innovative development of the regions of Kazakhstan, the analysis of the effectiveness of the formation and functioning of the factors of innovative activity of the regions.

Efficiency is a complex property of any purposeful activity which shows the degree of achievement of the goal, taking into account the costs and time resources. To measure the effectiveness of the correlate the results obtained with the costs incurred. Usually, when analysing economic efficiency, traditional profitability indicators are used. However, this information is not enough for an objective assessment of how efficiently certain types of resources are used, how much the resource potential has been exhausted in various regions, how rational resource provision can affect the final results of innovation activities. Based on this, the present study uses the neoclassical approach within the framework of the concept proposed by Farrell (1957), which explicitly or implicitly underlies the majority of work on economic efficiency, to assess the efficiency of using certain types of resources. In particular, it examines the technical efficiency of the use of production resources.

The purpose of the research is to determine the level of regional innovation development, evaluation the effectiveness of existing regional innovation systems and provide recommendations for improving economic policy for the purposes of optimal use of resources in regional innovation activities.

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Methods of the research, in the process of the research, statistical methods of processing economic data, were used as well as Data Envelopment Analysis (DEA).

2. Methodical approaches

The concept of technical efficiency in the use of production resources implies a comparison of objects (decision making units, DMU) according to the degree of their use of their resources. The best are taken as "reference", ensuring maximum output of products per resource unit. In our understanding, the most simple and clear methodological tools for determining technical efficiency were proposed in 1978 in their article by American scientists A. Charnes, W. W. Cooper, E. Rhodes (Charnes, A., Cooper, W. W., Rhodes, E. 1978. Measuring the efficiency of Decision Making Units, *European journal of operational research*, Vol. 2: 429–444), which saves us from having to give detailed methodological calculations, limited only by the most necessary explanations.

In science and research of developed countries, the Data Envelopment Analysis (DEA) method is quite well known and is used by such authors as Malmquist (1953), Farrel (1957), Sueyoshi T. (1992), Färe et al. (1994), Chung Y.H., Cooper W., Seiford L., Tone K. (2007), Karimzadeh M. (2012), Bian Y., He P., Xu H. (2013). Carrillo M., Jorge J.M. (2016) and others. On the territory of the CIS countries, this method is not so well known and is used by Russian scientists mainly to assess the effectiveness in the banking sector - Arshinova T. (2011), Teplova T.V., Sokolova T.V. (2017), in agriculture- Serova E.V., Grazdaninova M.P., Karlova N.A. (2003), Sazonov, S. and Sazonova, D. (2005), Tillak P., Epstein D. (2003), in environmental management - Ratner S.V., Ratner M.D. (2017), Ratner S.V., Iosifov V.V. (2018), in the analysis of socio-economic systems - Morgunov E.P. (2007), Piskunov A.A. (2008), Krivonozhko V.E. (2010).

In this research, the performance indicators of innovative systems in the regions of Kazakhstan are calculated using the non-parametric Data Envelopment Analysis (DEA) method for a convex model, with constant and variable effects of scale, focused on maximum output and minimum resource costs.

There are a number of objects (DMU) - in our case, the regions of Kazakhstan, each of which is described by a set of inputs and outputs (resources and outputs). They are homogeneous in this respect.

Inputs are resources consumed by objects (in a general sense, what actors seek to reduce);
Outputs are the outputs produced (in a general sense, what actors seek to increase);
Efficiency - the ratio of inputs to outputs.

The system is represented as a black box (that is, the internal structure of the interconnections between inputs and outputs, the parameters of these interconnections are unknown). The solution consists in finding the most efficient objects and defining model (reference) objects and parameters for inefficient ones.

The essence of this method is as follows. Figure 1 shows the set of DMUs: P1, P2, P3, P4, P5, P6, which, using the same resource X, produce the product Y. The return of the resource for each DMU is determined by the ratio Yi / Xi. DMU P2 has the greatest return on the resource.

If, with an increase in the amount of the resource, its return in the reference DMUs does not decrease, then the reference DMUs will be on the OP2 line. This line is the border of production capabilities with a constant effect of scale - CRS (Constant Returns to Scale): if the input parameters change proportionally, the output parameters will change in the same proportion. But if, with an increase in the amount of a resource, its return changes, then the border between the P1, P2, P3, P4 points will act as the boundary of the production capabilities — the line on which the reference DMUs lie (point P1 corresponds to the regions with the least amount of resources). Capacity

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with variable scale effect – VRS. This curve is the limit of production (Variable Returns to Scale). The technical effectiveness of DMUs lying on the shell (the boundary of production capabilities) is equal to one.

For DMU P5, which is under the envelope curve, the technical efficiency scores are determined as follows:

- net (local) efficiency is technical efficiency with a variable effect of scale, oriented maximum outputs (performance) - TEV0 = KP5 / KL or oriented minimum inputs (resources) - TEVI = AC / AP5. Net (local) technical efficiency reflects the efficiency of the DMU (quality of business processes);

- total (global) efficiency is technical efficiency with a constant scale effect TEC = KP5 / KM;

- scale efficiency = total efficiency / net efficiency. Scale efficiency reflects the adverse conditions in which the DMU operates.

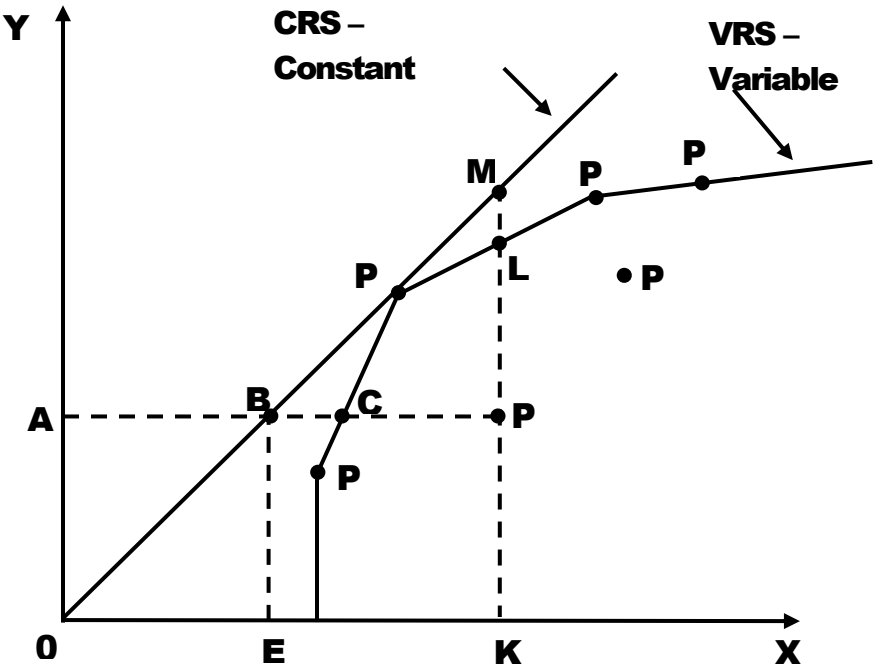

Fig. 1. Graphical interpretation of the DEA method

Source: drawn by authors

To understand the differences in the types of technical efficiency given above, it is necessary to take into account that efficiency is a complex property of any purposeful activity that manifests itself only in the process of the system functioning and reflects the degree of suitability of the system for its use for its intended purpose. In our case, we consider regional innovation systems as a system, and the intended purpose is to increase the level of innovation development (innovation) of the region.

The effectiveness of the system is determined by factors that can be divided into:
- internal factors characterizing net or local efficiency - quality of management, quality of business processes functioning, quality of resources used;

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- external factors that characterize the overall or global efficiency - the structure of the system, the technology used functioning;
- environmental factors characterizing the effectiveness of scale - conditions of the system's functioning: geographical location, climatic conditions, legislative, budgetary and tax restrictions, etc.

Thus, depending on the obtained results of the calculation according to the DEA methodology, it is possible to localize the problem area of the functioning system (region, DMU) and develop targeted measures to eliminate or level out negative factors affecting the efficiency of the system (DMU).

There are also other attractive properties of the DEA method:
- allows to calculate one aggregated - scalar - indicator for each object;
- can simultaneously process many inputs and many outputs, each of which can be measured in different units of measure;
- allows to take into account external variables in relation to the system under consideration - environmental factors;
- does not require an priori indication of weights for variables corresponding to the input and output parameters when solving the optimization problem;
- does not impose any restrictions on the functional form of the relationship between inputs and outputs;
- allows, if necessary, to take into account the preferences of managers regarding the importance of certain input or output variables;
- makes specific assessments of the desired changes in the inputs / outputs that would allow the inefficient objects to be brought to the efficiency margin;
- forms the Pareto-optimal set of points corresponding to efficient objects;
- focuses on identifying examples of so-called best practice (best practice), and not on any average trends, such as regression analysis.

3. DEA method limitations

This method does not contain restrictions related to the functional form of the model, the only requirement of the DEA-models is that all the results obtained fall either on or below the effective boundary. Otherwise, the researcher will face mixed, rather than technical efficiency, an element of which will be structural inefficiency (that is, with a given structure and the proportions of input resources, this sampling unit cannot achieve efficiency).

The specificity of the DEA method is that it is illegal to compare the results by time series, that is, it is impossible to identify the trend in DMU performance indicators by years, but it is possible to compare the values of indicators for different DMUs in a fixed year. This limitation is due to the method of DEA-simulation, namely the pairwise comparison of each DMU with each other, which shows that the evaluation of DMU effectivity may be different in different periods are not due to the fact that DMU optimized or worsened his attitude "output - input", but because of the fact other DMU changed their "output - input".

4. Main results of the research

For the calculation in this study, the publicly available version of the DEAP program was used (http://www.uq.edu.au/economics/cepa/deap.php).

Evaluation of the effectiveness of the innovation system of the regions of Kazakhstan included evaluation for 4 inputs and 4 outputs. The actual values of the indicators are given in table 1.

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Table 1. Baseline data for 2017 regions of Kazakhstan

Regions (administrative areas) of Kazakhstan	Resources (Model inputs)				Results (Model outputs)			
	Number of R & D employees, person	R & D and innovation costs, mln. tenge	Number of organizations performing R & D units	Number of innovation infrastructure, units	Number of issued security documents, units	Number of enterprises using new technologies, units	Number of new technologies and equipment used, units	Volume of innovative products produced, mln. tenge
	input1	input2	input3	input4	output 1	output2	output3	output4
Akmola	678	38 074,0	11	3	88	38	147	15 721,9
Aktobe	362	57 900,3	16	5	102	60	130	39 442,0
Almaty	968	9 923,0	11	4	272	15	45	12 624,2
Atyrau	474	145 345,6	10	5	49	71	111	5 768,0
West Kazakhstan	323	6 855,3	8	9	61	8	12	18 122,1
Zhambylskaya	377	13 588,3	11	3	113	12	127	50 854,7
Karaganda	1 360	32 208,5	29	9	335	35	65	32 048,0
Kostanay	569	37 098,0	14	2	82	114	362	91 502,6
Kyzylorda	229	6 592,7	8	3	51	31	64	5 505,8
Mangystau	696	13 716,5	6	5	37	5	15	294,9
South Kazakhstan	1 090	188 446,8	19	8	338	34	505	125 231,6
Pavlodar	654	111 188,1	11	7	138	24	128	177 881,5
North Kazakhstan	93	21 744,6	5	5	121	15	547	13 804,9
East Kazakhstan	2 325	106 347,6	34	11	160	44	147	80 472,0
Astanacity	3 062	109 231,6	62	40	778	36	1 258	149 277,5
Almaty city	8 821	77 854,3	131	27	2 317	162	1 628	26 183,3

Source: compiled by the authors based on the results of DEA analysis

The results of the calculations of the input-oriented model are given in Table 2. Recall that the goal of the input-oriented model is to minimize the input parameters, while the output parameters must either remain at the initial level or increase.

Table 2. The results of the calculation of the model with a focus on input for the regions of Kazakhstan

Regions (administrative areas) of Kazakhstan	CRS (Constant Returns to Scale)		VRS (Variable Returns to Scale)		Scale efficiency	
	value	Conclusion on overall / global efficiency	value	Clean / Local Performance Conclusion	value	Conclusion on Scale Efficiency
Akmola	0,612	ineffective	0,935	ineffective	0,654	ineffective
Aktobe	0,854	ineffective	0,854	ineffective	0,999	ineffective
Almaty	1	effective	1	effective	1	effective
Atyrau	0,872	ineffective	1	effective	0,872	ineffective
West Kazakhstan	0,845	ineffective	1	effective	0,845	ineffective
Zhambylskaya	1	effective	1	effective	1	effective
Karaganda	0,774	ineffective	1	effective	0,774	ineffective
Kostanay	1	effective	1	effective	1	effective
Kyzylorda	1	effective	1	effective	1	effective
Mangystau	0,285	ineffective	1	effective	0,285	ineffective
South Kazakhstan	1	effective	1	effective	1	effective
Pavlodar	1	effective	1	effective	1	effective

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North Kazakhstan	1	effective	1	effective	1	effective
East Kazakhstan	1	effective	1	effective	1	effective
Astanacity	1	effective	1	effective	1	effective
Almaty city	1	effective	1	effective	1	effective
Main	0,890125		0,9868125		0,901825	

Source: compiled by the authors based on the results of DEA analysis

The model with constant returns to scale is more stringent and imposes serious additional restrictions. It is natural that the average value of technical efficiency, calculated by this model, equal to 0.89, is significantly lower than that calculated by the variable effect of scale, which was 0.98. The scale efficiency, which characterizes the ratio of efficiency, calculated by a constant effect of scale, to efficiency by a variable effect, is on average 0.9.
The share of innovation systems in the regions of Kazakhstan that formed an effective front ("reference" regions), with constant and variable scale effects, was, respectively, 63% and 88%. Consequently, if we evaluate technical efficiency oriented at minimizing resource costs by a less rigid model (with a variable effect of scale), then we can assume that 12% or 2 regions can improve their performance by reducing resource costs.
Parameters of technical efficiency, focused on maximizing production (in our case - the results of innovation) are listed in Table. 3. The goal of the output-oriented model is to maximize the output parameters, while the input parameters should remain either at the initial level or decrease.

Table 3. The results of the calculation of the model with a focus on output for the regions of Kazakhstan

Regions (administrative areas) of Kazakhstan	CRS (Constant Returns to Scale)		VRS (Variable Returns to Scale)		Scale efficiency	
	value	Conclusion on overall / global efficiency	value	Clean / Local Performance Conclusion	value	Conclusion on Scale Efficiency
Akmola	0,612	ineffective	0,694	ineffective	0,881	ineffective
Aktobe	0,854	ineffective	0,94	ineffective	0,908	ineffective
Almaty	1	effective	1	effective	1	effective
Atyrau	0,872	ineffective	1	effective	0,872	ineffective
West Kazakhstan	0,845	ineffective	1	effective	0,845	ineffective
Zhambylskaya	1	effective	1	effective	1	effective
Karaganda	0,774	ineffective	1	effective	0,774	ineffective
Kostanay	1	effective	1	effective	1	effective
Kyzylorda	1	effective	1	effective	1	effective
Mangystau	0,285	ineffective	1	effective	0,285	ineffective
South Kazakhstan	1	effective	1	effective	1	effective
Pavlodar	1	effective	1	effective	1	effective
North Kazakhstan	1	effective	1	effective	1	effective
East Kazakhstan	1	effective	1	effective	1	effective
Astanacity	1	effective	1	effective	1	effective
Almaty city	1	effective	1	effective	1	effective
Main	0,890125		0,977125		0,9103125	

Source: compiled by the authors based on the results of DEA analysis

The value of technical efficiency, calculated by the constant effect of scale, when solving the problem on the maximum output of the results coincides with the value of this indicator, obtained by solving the problem, focused on the minimum resource costs, and is 0.89. Given the proportional change in input and output parameters in the model with a constant effect of scale, the results of the calculation with a focus on the inputs and outputs will always be identical. The average value of technical efficiency, calculated from the variable scale effect, was 0.977.

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The share of regions that have formed an effective front ("reference" regions), with a variable effect of scale, was 88%. Therefore, it can be assumed that 12% or 2 regions can improve the performance of their activities by increasing the results of innovation activities.

5. Discussion

Evaluating the results, we note the following: the regions of Kazakhstan have significant reserves for improving the efficiency of innovation activities. For example, the average efficiency factors of using the production potential, determined for each of the three models, are respectively 0.89, 0.986 and 0.977. At the same time, the scale efficiency was 0.9 for the minimum-oriented model, and 0.91 for the maximum-oriented model. This means that on average, the regions of Kazakhstan have realized their innovative potential by no more than 90% and 91%, respectively.

When comparing the results of both models, it can be noted that the locally inefficient regions in both models are the same in the Akmola and Aktobe regions equally poor quality of the resources involved in innovation activity (expensive and / or low productive resources) and poor quality of business process management. In this situation, it is necessary to recommend reviewing the current structure and infrastructure of the regional innovation system, to consider the principles and management technologies in the reference regions.

According to the authors of the study, when developing recommendations for regional economic policy, it is necessary to rely on the results of the exit-oriented model. This choice is due to the fact that out of the four inputs (resources) considered, only one represents expenses in monetary form (R & D costs), the other three resources are already existing objects (infrastructure facilities, research organizations, research teams), whose reduction only will increase social tensions in the regions. In this situation, it makes sense to set the task not to reduce resources, but to increase the efficiency and effectiveness of their functioning. When choosing between the models of CRS and VRS, one should prefer the variable of the model of VRS, since the relationship among numbers of researchers and the quality and volume of their work will be non-linear.

Based on these assumptions, we consider the recommended target values for two regions - Akmola and Aktobe regions (Tables 4 and 5).

Table 4. Recommended target values for Akmola region according to VRS model with exit orientation

Variable	Original value	Radial movement	Slack movement	Projected value
output 1	88.0	38.782	0.0	126.782
output 2	38.0	16.747	4.270	59.017
output 3	147.0	64.784	0.000	211.784
output 4	15721.9	6928.779	19863.457	42514.136
input 1	678.0	0.0	-125.970	552.030
input 2	38074.0	0.0	-17304.211	20769.789
input 3	11.0	0.0	0.0	11.0
input 4	3.0	0.0	0.0	3.0

Source: compiled by the authors based on the results of DEA analysis

Despite the fact that we use a model with a focus on output, i.e. the goal is to obtain recommendations for increasing output indicators, in some cases to issue recommendations for reducing the values of input indicators. This is the case for inputs 1 (number of R & D workers) and 2 (R & D and innovation costs).

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The standards for this region will be the North Kazakhstan (0.068), Kostanay (0.402) and Almaty (0.265) regions. In parentheses are the weights of the influence of the reference region to achieve the effectiveness of the region in question.

Table 5. Recommended target values for the Aktobe region according to the VRS model with exit orientation

Variable	Original value	Radial movement	Slack movement	Projected value
output 1	102.0	6.466	0.0	108.466
output 2	60.0	3.804	0.0	63.804
output 3	130.0	8.241	304.597	442.838
output 4	39442.0	2500.349	10231.853	52174.202
input 1	362.0	0.0	0.0	362.0
input 2	57900.3	0.0	-28373.964	29526.336
input 3	16.0	0.0	0.0	16.0
input 4	5.0	0.0	-1.334	3.666

Source: compiled by the authors based on the results of DEA analysis

For the Aktobe region, as a result of the model calculation, recommendations were given not only to increase outputs, but also to reduce inputs 2 (R & D and innovation costs) and 4 (innovation infrastructure facilities).
The standards for this region will be the North Kazakhstan (0.484), Karaganda (0.0288) regions and Almaty (0.0001). In parentheses are the weights of the influence of the reference region to achieve the effectiveness of the region under consideration.

Using the obtained target values of inputs and outputs, as well as having studied the experience of the reference regions, the regional administration and the local business community can develop a set of measures to enhance and increase the efficiency of innovation activities, which will not only increase the competitiveness of regions, but also as a result improve the quality of life of the population.

Conclusions

Currently, the economy of Kazakhstan has a predominantly commodity profile and the main task is to diversify the economy, transfer it to an innovative industrial profile. One of the ways is to increase the efficiency of regional innovation activities. Analysis of the efficiency of resource use and the effectiveness of innovation processes will help identify problem areas and formulate economic policy measures to increase the level of innovative development of the regions of Kazakhstan.

References

Farrell, M. J. 1957. The measurement of Productive efficiency. *Journal of the Royal Statistical Society*, Series A (General), 120(3): 253-290. https://doi.org/10.2307/2343100

Charnes, A., Cooper, W. W., Rhodes, E. 1978. Measuring the efficiency of Decision Making Units, *European Journal Of Operational Research*, 2: 429–444. https://doi.org/10.1016/0377-2217(78)90138-8

Cooper, W., Seiford, L., Tone, K. 2007. *Data Envelopment Analysis. A Comprehensive Text with Models, Applications, References and DEA-Solver Software. 2nd Edition* Published by Springer US. https://doi.org/10.1007/978-0-387-45283-8 ISBN 978-0-387-45281-4

Karimzadeh, M. 2012. Efficiency Analysis by Using Data Envelop Analysis Model: Evidence from Indian Banks. Int. *Journal Latest Trends Fin. Econ*, 2(3): 228-237.

Bian, Y., He, P., Xu, H. 2013. Estimation of potential energy saving and carbon dioxide emission reduction in China based on an ex-tended non-radial DEA approach. *Energy Policy*, 63: 962–971 https://doi.org/10.1016/j.enpol.2013.08.051

Carrillo, M., Jorge, J.M. 2016. A multiobjective DEA approach to ranking alternatives. *Expert Systems with Applications*, 50: 130–139. https://doi.org/10.1016/j.eswa.2015.12.022

Charnes, A., Cooper, W., Rhodes, E. 1981. Evaluating program and managerial efficiency: An application of data envelopment analysis to program follow through. *Management Science*, 27: 607–730. https://doi.org/10.1287/mnsc.27.6.668

Charnes, A., Cooper, W. W., Rhodes, E. 1978. Measuring the efficiency of Decision Making Units. *European journal of operational research*, 2: 429–444

Charnes, A., Clarke, C., Cooper, W., Golany B. 1984. A development study of DEA in measuring the effect of maintenance units in the U.S. Air Force. *Annals of Operation Research*, 2(1): 95–112. https://doi.org/10.1007/BF01874734

Chung, Y.H., Färe, R., Grosskopf, S. 1997. Productivity and undesirable outputs: A directional distance function approach. *Journal of Environmental Management*, 51(3): 229–240. https://doi.org/10.1006/jema.1997.0146

Cooper, W.W., Seiford, L.M., Tone, K. 2006. *Introduction to Data Envelopment Analysis and its Uses*, Published by Springer US. https://doi.org/10.1007/0-387-29122-9 ISBN 978-0-387-28580-1

DEAP program http://www.uq.edu.au/economics/cepa/deap.php

Färe, R., Grosskopf, S. Lovell C.A.K. 1994. *Production Frontiers*. – Published by Cambridge University Press. ISBN 978-0521072069, 382p.

Färe, R., Grosskopf, S. 2004. Modelling undesirable factors in efficiency evaluation: comment. *European Journal of Operational Research*, 157: 242–245. https://doi.org/10.1016/S0377-2217(03)00191-7

Korhonen, P.J., Luptacik, M. 2004. Eco-efficiency analysis of power plants: An extension of data envelopment analysis. *European Journal of Operational Research*, 15: 437–446. https://doi.org/10.1016/S0377-2217(03)00180-2

Malmquist, S. 1953. Index numbers and indifference surfaces. *Trabajos de Estatistica*, 4(2): 209–242. https://doi.org/10.1007/BF03006863

Sueyoshi, T. 1992. Comparison and analyses of managerial efficiency and returns to scale of telecommunication enterprises by using DEA/WINDOW, *Communications of the Operations Research Society of Japan*, 37: 210–219.

Wang, K., Shiwei, Yu., Zhang, W. 2013. China's regional energy and environmental efficiency: A DEA window analysis based dynamic evaluation. *Mathematical and Computer Modelling*, 58(5–6): 1117–1127. https://doi.org/10.1016/j.mcm.2011.11.067

Wu, H., Shi, Y., Zhu, W. 2014. Effectiveness of the policy of circular economy in China: A DEA-based analysis for the period of 11th five-year-plan, *Resources. Conservation and Recycling*, 83: 163–175. https://doi.org/10.1016/j.resconrec.2013.10.003

Arshinova T. 2011. Construction of Equity Portfolio on the Basis of Data Envelopment Analysis Approach. *Scientific Journal of Riga Technical University*, 45. https://doi.org/10.2478/v10143-011-0050-1

Teplova, T.V., Sokolova, T.V. 2017. Nonparametric method of shell analysis for portfolio construction in the Russian bond market. *Economics and mathematical methods*, 53(3): 110-128. https://publications.hse.ru/articles/208456687

Serova, E.V., Grazhdaninova, M.P., Karlova, N.A. and others. 2003. Market purchased resources in Russian agriculture. *IET Scientific Works* No. 63R: 195 http://ecsocman.hse.ru/text/19190279/

Tillak, P., Epstein, D. 2003.Technical Efficiency of Agricultural Enterprises of the Leningrad Region. *International Agricultural Journal*, 4: 33-46; https://elibrary.ru/item.asp?id=21334493

Sazonov, S., Sazonova, D. 2005. Development of Peasant Farms in Central Russia. *Comparative Economic Studies*, 47(1): 101–114. https://doi.org/10.1057/palgrave.ces.8100079

Ratner S.V., Ratner M.D. 2017. Evaluation of the effectiveness of regional environmental management systems. *Izvestia Volgograd State Technical University*, 7 (202): 8-16. https://elibrary.ru/item.asp?id=30006922

Ratner, S.V., Iosifov, V.V. 2018. Assessment of the degree of compliance of the regional economic growth model with the principles of sustainable development using non-parametric optimization. *Regional economy: theory and practice*, 16(9-456): 1749-1765. https://doi.org/10.24891/re.16.9.1749

Piskunov, A.A., Ivanyuk, I.I., Danilina, E.P., Lychev, A.V., Krivonozhko, V.E. 2008. System rating regions using the methodology of the ASF. *Bulletin AKSOR*, 4: 24–30.

Krivonozhko, V.Ye., Lychev, A. V. 2010. *Analysis of the activities of complex socio-economic systems*. Moscow: Published by Publishing department of the faculty of the Moscow State University and Moscow State University. MAX Pres., 393p.

Krivonozhko, V.Ye., Propoi, A.I., Senkov, R.V., Rodchenkov, I.V., Anokhin P.M. 1999. Analysis of the performance of complex systems. *Design automation*, 1: 2–7.

Morgunov, E. 2007. Decision support system in the study of the effectiveness of complex systems: design principles, requirements and architecture. *Bulletin of the Siberian State Aerospace University*, 3(16): 59–63. https://cyberleninka.ru/article/v/sistema-podderzhki-prinyatiya-resheniy-pri-issledovanii-effektivnosti-slozhnyh-sistem-printsipy-razrabotki-trebovaniya-i-arhitektura

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INSTITUTIONAL DETERMINANTS OF ENVIRONMENTAL POLLUTION IN RUSSIA: A NON-LINEAR ARDL APPROACH

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Abstract. This paper aims to examine how institutional factors affect carbon dioxide emission in case of Russia with an emphasis on the asymmetrical effects of corruption. Institutional factors include corruption perception in the sampled economy and income inequality. The study deploys a non-linear autoregressive distributed-lagged approach to the hypothesis testing. Using the data for the period 1996-2018 of the sampled factors, affecting carbon dioxide emission in Russia, we aim to find the existence of the cointegration between the variables and determine the existence of the asymmetrical effects. In the results of the empirical investigation it was found that carbon dioxide emissions, corruption and income inequality in Russia are cointegrated. In both the long and short run, positive shocks in corruption increase environmental degradation in Russia. A 1% increase in corruption leads to a 0.13% and 0.17% rise in CO2 emission in the short and long run respectively under 5% significance level. Income inequality is found to be a statistically insignificant determinant of carbon dioxide emission in Russia.

Keywords: carbon dioxide emissions, corruption, income inequality, cointegration, asymmetrical effect

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JEL Classifications: D31, D73, Q43, Q56

1. Introduction

Environmental pollution is one of the main areas of research in the field of the environmental economics. The problems of climate changes, global warming and worsening quality of environment, brought to life by an increased industrial output, are related to an increased greenhouse gases emission, which include carbon dioxide,

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methane and nitrous oxide as well. Thus, environmental degradation sufficiently reduces the potential of sustainable development.

Concerning the studied country, one should notice, that Russia takes the 4th place among other countries, contributing in the world carbon dioxide emissions, after China, the United States of America and India in total kilotons (kt). Yet, in terms of kilogram (kg) of carbon dioxide emission per GDP, measured in 2010 US dollars, in 2014, according to the World Bank data (2018), Russia with 0.999 kg outplaced the US with 0.324 kg. According to the world tendency among developed countries, carbon dioxide steadily declines. However, in Russia carbon dioxide emissions continue to rise. Since 1998 minimum, the level of carbon dioxide emissions has increased on 14% up to 2014. If the GDP is taken into account, the picture changes: carbon dioxide emissions, measured as kg per 2010 US dollars of GDP, decline from 1.839 in 1998 to 0.999 in 2014. This tendency is the result of using more friendly-environmental technologies in some sectors of the national economy.

Even taking into account the active use of technologies that contribute to the preservation of the environment, the question of pollution still stands rather sharp in Russia. One of the most striking answers to the question of environmental pollution is the formation and development of models of sustainable green growth, based on renewable energy sources. In other words, global green growth and sustainable development of the national economy are closely linked. Measuring the growth of the national income is, in most cases, framed by the gross domestic product concept. However, employing the GDP concept is thought to be narrow and incomplete, that is, it does not take into account the impact of the economy on the environment. In this regard, employing GDP for estimating national development is seen as insufficient to assess the sustainability and quality of such development. The industrial model of economic development implies extensive or intensive expansion of production and sales of goods and services on the basis of existing technologies. In most cases, non-renewable energy sources are the basis for economic development. The last decade has shown the deterioration of the environment and has led to the need to strengthen the role of renewable energy in the production of GDP. Thus, energy consumption is an important part of economic growth. On the one hand, energy consumption growth is associated with GDP growth. On the other hand, growth in energy consumption, ceteris paribus, is associated with increased CO2 emissions. Active use of renewable energy could reduce CO2 emissions and improve the environment, while at the same time ensuring sustainable development and green growth.

The case of Russia seems very significant, since on the one hand Russia really takes the 4th place in terms of CO2 emissions, and on the other hand continues to actively increase energy consumption. For example, for 1998, the level of energy consumption in the Russian economy was 3, 981.502 kg. of oil equivalent per capita. This value is a local minimum, as throughout the subsequent time a steady increase in energy consumption in the national economy is observed with a maximum value of 5,167.012 kg. of oil equivalent per capita in 2012. It is logical to assume that the energy consumption growth is associated on the one hand with the growth of the GDP, and on the other hand with the ongoing processes of urbanization, internal labor migration, with growth of marginal propensity to consume and other important factors. It is important to note that Russia is a net exporter of conventional types of energy resources. In this regard, the structure of energy consumption is quite stable and has not changed significantly for almost 20 years. In other words, abundancy of energy resources eliminates incentives for the use of renewable energy, thereby mitigating the stimuli for improving the environmental quality and ensuring sustainable green growth.

Confirmation of this thesis can be found if we refer to data on the consumption of renewable energy sources in the total amount of energy consumed. Data of the World Bank on renewable energy consumption in Russia shows a downward trend. As of 1990, renewable energy consumption as a percentage share of the total final energy consumption, was only 3.75%. Over the next 3 years, the share of renewable energy consumption increased up to 4%. Since 1995, the share of renewable energy consumption has been declining steadily. As of 2000, the share of

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renewable energy consumption had fallen to 3.5 per cent again. At the time of Russia's entry into the Great Recession of 2007-2009, the share of renewable energy consumption fell to 3.3% and remains at this level.
The use of renewable energy sources is one of the key elements to ensure green growth and sustainable development in the national economy. From this point of view, the state of the renewable energy market in Russia is deplorable. On the one hand, the national policy encourages the use of renewable energy to preserve the environment and the implementation of plans to reduce CO2 emissions within the framework of international agreements. On the other hand, the scale of investments in green energy, respectively, in green economic growth is insufficient given the surplus of non-renewable energy resources, including oil and gas.

In addition to environmental and technological factors, the institutional environment is another important factor. For example, the level of corruption and income inequality could significantly impact the structure of energy consumption on the one hand and the level of environmental degradation on the other. For example, a high level of monopolization or cartelization of energy infrastructure and housing and communal services could lead to an inflated level of energy prices for both households and business entities. In order to reduce costs, the use of renewable energy for both personal and production purposes can be a good example of green growth of the markets, usually driven by small and medium-sized businesses.

Thus, it is logical to assume that a high level of corruption in the national economy can serve as a barrier to sustainable development and green growth based on the use of renewable energy sources, thereby supporting an increase in CO2 emissions.

Another important institutional factor is income inequality. It's assumed that income inequality is closely linked to the level of corruption of the national economy. It is believed that an increase in the level of corruption leads to increasing gaps between incomes of the rich and the poor. It is also known that high levels of corruption are associated with high CO2 emissions. In other words, increasing income inequality can reduce the capacity of households to use renewable energy to mitigate the assumption of the budget constraint. Thus, we assume that the high level of income inequality of the population can contribute to the environmental degradation.

2. Literature review

The existing literature on the green growth and sustainable development is associated with the search for indicators that characterize the sustainable progressive development of the national economy, taking into account the environmental issues. In this regard, international research on this issue adheres to a number of directions.

The first one is focused on the relationship between CO2 emissions, energy consumption and economic growth. E.g., Acaravci and Ozturk (2010) investigated the causal relationship between carbon dioxide emissions, energy consumption, and economic growth by using autoregressive distributed lag (ARDL) bounds testing approach of cointegration for nineteen European countries. They found evidence of a long-run relationship between carbon emissions per capita, energy consumption per capita, real gross domestic product (GDP) per capita and the square of per capita real GDP. Acheampong (2018), applying panel vector autoregression along with a system-generalized method of moment, examined the dynamic causal relationship between economic growth, carbon emissions and energy consumption for 116 countries over the period 1990–2014. The study found that energy consumption uni-directionally causes economic growth and carbon emission. Also a bi-directional causality between carbon emissions and economic growth was detected. Sekrafi and Sghaier (2018) investigated whether energy consumption, corruption, environmental quality, and political instability affect economic growth in 13 Middle East and North African (MENA) countries over the period 1984–2012. The results in the „growth-CO2 emissions" nexus showed that economic growth affected CO2 emissions and energy consumption, while CO2 emissions affected economic growth. Pao and Tsai (2010) investigated the nexus on the panel of BRIC countries.

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They found that energy consumption has a positive and statistically significant impact on emissions. Nejat et al. (2015) investigated energy consumption, CO2 emissions and energy policies in the residential sector in China, the US, India, Russia, Japan, Germany, South Korea, Canada, Iran, and the UK. In some countries energy consumption led to significant GHG emissions. Islam et al. (2017) investigated the impact of energy consumption, economic growth, population, poverty, and forest area on carbon dioxide emissions by using the econometrics approaches for Malaysia, Indonesia and Thailand. The results showed that energy consumption and economic growth had positive relationship with CO2 emission. Bass (2019) investigated the relationship between electricity consumption and economic growth in Russia. Results showed that the sampled variables are cointegrated and there exists a long-run relationship between them. Yang et al. (2017) estimated the economy-related GHG emissions in Russia over the period of 1998–2013 in terms of energy consumption emissions, industrial process emissions, animal husbandry emissions, and fugitive emissions. The results supported the Environmental Kuznets Curve hypothesis with Russia reaching the threshold in ten years. Tan and Tan (2018) investigated the causal relationship between real income, energy consumption and carbon dioxide emission in Malaysian industrial sector during the period of 1980-2014, by applying the time-series econometric techniques. The results show that a long-run relationship exists between the variables and unidirectional causality relationship from energy consumption and CO2 emissions to real income in both short and long-run. Ozturk and Acaravci (2010) examined the long run and causal relationship issues between economic growth, carbon emissions, energy consumption and employment ratio in Turkey by using autoregressive distributed lag bounds testing approach of cointegration. They found a long-run relationship between the variables at 5% significance level in Turkey. Results for the existence and direction of Granger causality show that neither carbon emissions per capita nor energy consumption per capita cause real GDP per capita. Similar results for the Turkish case were obtained by Bozkurt and Akan (2014). They investigated economic growth, CO2 emissions and energy consumption relationship in Turkey by using cointegration test. The results showed that energy consumption positively affects economic growth, while CO2 emissions negatively affect it. The results of the EKC hypothesis testing for Turkish case, presented by Shahbaz et al. (2013), showed that energy intensity and economic growth increase CO2 emissions. Albiman et al. (2015) investigated the nexus in the Tanzania by applying Toda and Yamamoto non-Causality test. They found that economic growth rate and energy consumption per capita, both being unidirectional, cause environmental pollution through carbon emission in Tanzania. Moreover, they found that a significant and positive economic growth due to shocks from electricity per capita (energy consumption) and carbon emission with time, which is similar to Bass (2019) for the Russian case. Shahbaz et al. (2015) tested the EKC hypothesis for Portugal by applying autoregressive distributed lag bounds testing approach from 1971 to 2008. They augmented the traditional income-emissions model with variables such as energy consumption, urbanization, and trade openness in time series framework. Empirical results confirmed the evidence of EKC hypothesis in both the short-run and long-run. Shahzadd et al. (2017) examined the cointegrating relationship between carbon emissions, energy consumption, trade openness and financial development in Pakistan using ARDL bounds test. The results shower an inverted U-shaped relationship between carbon emission and energy consumption with economy beind below the threshold, stating that energy consumption induced CO2 emissions. Al-mulali and Sab (2018) investigated the impact of energy consumption and CO2 emissions on the United Arab Emirates's economic and financial development. The results showed that energy consumption and CO2 emissions had a long-run relationship with the economic and financial development indicators in the UAE. Also a causality from energy consumption to CO2 emissions was detected.

Yet, some studies state that the „energy consumption-economic growth-CO2 emissions" nexus depends on the degree of the carbonisation of the national economy, dependent on the structure of the economy. Chang (2015), analyzing energy efficiency and environmental Kuznets curves in G7 group and BRICS countries, found that the G7 group has greater room for improvement in its carbonization value than the BRICS group before 2005; however, the latter has greater room for improvement in carbonization value than the former after 2005.

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Another important area of research for our study deals with the „corruption-emissions" nexus. E.g., Sekrafi and Sghaier (2018) found that corruption has an indirect effect on economic growth through energy consumption and environmental quality, an indirect effect on environmental quality through economic growth and an indirect effect on energy consumption through CO2 emissions and GDP. Cole (2007), employing data for 94 countries covering the period 1987–2000, estimated both direct and indirect impacts of corruption on air pollution emissions. For both sulfur dioxide and carbon dioxide, corruption is estimated to have a positive direct impact on per capita emissions. Indirect effects are found to be negative and larger in absolute value than direct effects for the majority of the sample income range. As a result, the total effect of corruption on emissions is negative for all but the highest income countries in the sample. Bass (2019) investigated the impact of institutional quality and world oil prices on performance of Russian manufacturing sector. The results of the study showed that oil prices, institutional quality and economic growth in Russia are cointegrated in the long-run. Yet short-run effects are statistically insignificant. Results of Granger causality test show unidirectional causality running from oil prices and institutional quality to economic growth. Farooq et al. (2013) found that corruption impedes economic growth, while financial development adds in economic growth, which is similar to the Russian case. (Bass, 2019) Fredriksson et al. (2004) investigated the effect of corruption on energy policy outcomes in case of 12 OECD countries. The results show that greater corruptibility of policy makers reduces energy policy stringency. Sekrafi and Sghaier (2018) evaluated the impact of corruption on the environmental quality in Tunisia. The results showed a positive and significant relationship between control of corruption and economic growth, a negative and significant relationship between control of corruption and environmental quality and a negative and significant relationship between control of corruption and energy consumption. Arminen and Menegaki (2019) examines the causal relationships between economic growth, energy consumption and carbon dioxide emissions in 67 high-income and upper-middle-income countries. They found a bidirectional causal relationship between GDP and energy consumption. Also climate and weather variations are found to be more important determinants of energy consumption and CO2 emissions than corruption, which suggest that changes in institutional quality are likely to have only a limited impact on energy and environmental policies. Chen et al. (2018) examined an impact of environmental regulation, shadow economy and corruption on the environment in China. The results showed that levels of environmental regulation and shadow economy are positively related with pollution, although environmental regulation is effective only when shadow economy and corruption are controlled. Lopez and Mitra (2000) examined the implications of corruption and rent-seeking behavior by the government for the relationship between pollution and growth. The results indicated that corruption is not likely to preclude the existence of an inverted-U-shaped-Kuznets environmental curve. Jabeur and Sghaier (2018) investigated the relationship between corruption, energy consumption, economic growth and CO2 emissions in the MENA region. Results showed that economic growth caused CO2 emissions, energy consumption is positively and significantly related to economic growth and also may increase CO2 emissions. However, corruption moderates economic growth and worsens the environmental quality in the MENA region. Zhang et al. (2016) investigated the relationship between corruption and CO2 emissions for APEC countries. The results show that the effect of corruption on CO2 emissions is heterogeneous among APEC countries. There exist a significant negative effect in lower emission countries and an insignificant in higher emission countries. They also found that corruption may have not only a negative direct effect on CO2 emissions, but also a positive indirect effect through its effect on per capita GDP. Wang et al. (2018) investigated the interaction between, economic growth and CO2 emissions.The results showed that the moderating role of corruption is crucial in the relationship between economic growth and carbon dioxide emissions. They found that control of corruption reduce CO2 emissions. Furthermore, a significant moderating effect of corruption was observed by Wang et al. (2018) on the relationship between urbanisation and carbon dioxide emissions in the case of BRICS countries, which signifies poor environmental performance therein.

The third area of research deals with "inequality-energy consumption-emissions" nexus. E.g., Khan and Heinecker (2018) investigate the impact of incomes distribution on the energy efficiency. They show that rising disparity for distributions of population density in census blocks in metropolitan statistical areas affects energy consumption efficiency in a diametrically different manner in cities and nation states leading to a higher urban

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carbon footprint while increasing energy efficiency nationally. Dong and Hao (2018) estimated the impact of urban-rural income inequality on electricity consumption in China. The results showed that urban-rural income inequality was negatively related with electricity consumption. Hao et al. (2016) investigated the impacts of income inequality on carbon emissions per capita in China. The results indicated that carbon emissions per capita increase as the income gap expands for nationwide and in the eastern and non-eastern regions of China. Baek and Gweisah (2013) examined the growth-inequality-environment nexus in the U.S. They found that income equality had a beneficial effect on the environment, economic growth was found to enhance environmental quality, although energy consumption had a detrimental effect on the environment. The opposite results are obtained by Kasuga and Takaya (2017) for Japan. The authors found that inequality negatively affects air quality in the 1990s. Evidence for a causal effect of inequality on pollution was also provided in the study. The heterogeneity of the above describe results is supported by Grunewald et al. (2017). They investigated the link between income inequality and per capita carbon dioxide emissions. The results showed that the relationship between income inequality and per capita emissions depends on the level of income: for low and middle-income economies, higher income inequality is associated with lower carbon emissions while in upper middle-income and high-income economies, higher income inequality increases per capita emissions.

Given the literature review above, we aim to fill the gap on the determinants of sustainable development and green growth. The paper states that maintaining environmental quality is one of the necessary elements of achieving green growth. Thereby investigating factors, affecting the level of carbon dioxide emission (CO2) seems rather actual and important in order to achieve environmentally sustainable economic development. Unfortunately, most studies investigate various factors, affecting CO2 emissions, meanwhile the possible asymmetrical effects of corruption on environmental degradation as well as the impact of income inequality on CO2 emissions fall out of sight. That is why we aim to fill this gap on the example of Russian case.

3. Materials and methods

Given the heterogeneity of the obtained results, discussed in the previous section, we aim to fill the gap by enquiring into the nature of the relationship between CO2 emissions, corruption and income inequality for the Russian case. Then the basic equation can be presented as follows:

$$CO2_t = \beta_0 + \beta_1 GINI_t + \beta_2 CPI_t + \varepsilon_t \quad (1)$$

where CO2 represents emission per capita in the sampled country; $GINI_t$ is income inequality measured by Gini coefficient for the sampled country; CPI_t is the corruption level, measured by Corruption perception index.

Then we transform linear specification of the model into log-linear specification. The log-linear specification provides more appropriate and efficient results compared to simple linear functional form of the model (Cameron, 1994). Moreover, logarithmic form of variables gives direct elasticities for interpretations. Therefore, we specify the estimated equation in log-linear form:

$$LCO2_t = \beta_1 + \beta_{GINI_t} LGINI_t + \beta_{CPI_t} LCPI_t + \mu_t \quad (2)$$

Also we aim to test the possible asymmetrical effects in renewable energy consumption reaction to positive and negative shocks in total energy consumption in Russia in order to estimate the potential reaction of CO2 emissions to various stimuli. For this purpose, we are using the methodology, developed by Shin et al. (2014) and decompose the energy use variable:

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$$LCPI_t^+ = \sum_{t=1}^{t} \Delta LCPI_t^+ = \sum_{t=1}^{t} \max(\Delta LCPI_t, 0) \quad (3)$$

$$LCPI_t^- = \sum_{t=1}^{t} \Delta LCPI_t^- = \sum_{t=1}^{t} \min(\Delta LCPI_t, 0) \quad (4)$$

Equations 3 and 4 divide the variable CPI_t into CPI_t^+ and CPI_t^- by taking the positive and negative partial sums of the changes in $LCPI_t$.

In order to estimate Equation 2 after incorporating the asymmetrical effects of CPI_t, we are employing the non-linear ARDL methodology, proposed by Shin et al. (2014). We employ exactly this model due to its advantages in presence of a mix order of integration as this technique follows the lower and upper bound F-values. In which, lower bound values are provided by assuming level stationary variables i.e. I(0) and upper bound values are provided by assuming the first differenced stationary variables i.e. I(1). Yet, if the variables are I(2) integrated, the use of this methodology is unacceptable. Also of great importance is that the NARDL approach allows differences in lags of the sampled variables in the data generating process. Endogenuity problem is absent in the NARDL approach because it also corrects for residual serial correlation. Also the NARDL approach allows to estimate short-run parameters by the means of the error correction model (ECM) adjustments.

That is why the first step of this study is to check the stationarity of the sampled variables and determine whether it is achieved without second differencing procedure. For this we employ four alternative unit root tests: the Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979), the Dickey–Fuller generalized least squares (DF-GLS) test proposed by Elliot et al. (1996), the Phillips and Perron (1988) PP test and the KPSS (Kwiatkowski et al., 1992) test. The null hypothesis of the ADF, DF-GLS and PP tests states that the there exists a unit root, while the alternative hypothesis states that the series are generated by a stationary process. The null hypothesis of the KPSS test is of reverse nature – it states that the series are stationary, while the alternative hypothesis states that the unit root is present.

The first step in the NARDL procedure is the determining the co-integration existence between the sampled variables. The bounds test examines long-run relationships, where the NARDL framework of the model (Equation 2) is expressed in Equation 5:

$$\Delta LCO2_t = \gamma_1 + \sum_{i=1}^{p} \gamma_i \Delta LCO2_{2t-i} + \sum_{j=0}^{q} \gamma_j \Delta LCPI_{t-j}{}^{+} + \sum_{l=0}^{r} \gamma_t \Delta LCPI_{t-j}{}^{-} + \sum_{s=0}^{n} \gamma_l \Delta LGINI_{t-s} + \\ + \gamma_{LCO2_{t-1}} LCO2_{t-1} + \gamma_{LCPI_{t-1}} LCPI_{t-1}^{+} + \gamma_{LCPI_{t-1}} LCPI_{t-1}^{-} + + \gamma_{GINI_{t-1}} LGINI_{t-1} + \mu_t$$

where, $\gamma_{LCO2_{t-1}}$, $\gamma_{LGINI_{t-1}}$, $\gamma_{LCPI_{t-1}}$represent short-term coefficients of the sampled variables in the logarithmic forms and γ_i, γ_j, γ_t, γ_l, represent the long-term coefficients of the sampled variables in the logarithmic forms; *q, r, m, n* are optimal lag lengths selected by Akaike Information Criterion (AIC) after imposition of maximum of 2 lags for each variable. We avoid more than 2 lags to save the degree of freedom. Moreover, Perron (1989) suggested to include maximum 4 lags for high frequency data like quarterly data and maximum 2 lags for low frequency data like annual data in our case.

After detecting the optimal lag length, Equation 5 may be tested for cointegration. Presence or absence of the relationship is tested by employing the joint F or statistics of the Wald test. The null hypothesis of no cointegration in the model is $\gamma_{LCO2_{t-1}} = \gamma_{LCPI+_{t-1}} = \gamma_{LCPI-_{t-1}} = \gamma_{LGINI_{t-1}} = 0$. The alternative hypothesis of cointegration between the variables is $\gamma_{LCO2_{t-1}} \neq \gamma_{LCPI+_{t-1}} \neq \gamma_{LCPI-_{t-1}} \neq \gamma_{LGINI_{t-1}} \neq 0$.

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To test the significance of the obtained results, the critical values for the bound test, reported in Pesaran et al. (2001) are used. The critical bounds are set as if the variables are of I(0) and are of I(1). If the F-statistics is above the upper bound of the critical values, the null hypothesis is rejected. If the F-statistics is below the lower critical bound, the null hypothesis is accepted. If the F-statistics is between the bounds, the results of the test are inconclusive.

The goodness of fit for NARDL model is checked through stability tests such as cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ).

The study aims to test the short and long-run relationships between CO2 emission, corruption and income inequality. The variables include carbon emission per capita in the sampled country, income inequality is measured by Gini coefficient for the sampled country and corruption level, measured by Corruption perception index by Transparency International. The data are collected from the World Bank's World Development Indicators database, Transparency International reports on Corruption Perception Index and Russian statistical database when and where needed.

4. Results and discussion

The study is based on Russian data for the sampled variables for the period 1996-2018 and is aimed test the short and long-run relationships between CO2 emission, corruption and income inequality as well as to investigate the possible asymmetrical effects of corruption on CO2 emissions. For the purposes of the study the bounds test approach is employed, that assumes the use of the variables with different order of integration, except integration of order above I(1). The first goal, then, should be the investigation of the order of sampled variables integration, achieving which supposes testing the variables for stationarity in order to determine if the ARDL approach suits the study. We employ four different unit root tests, including the ADF, the DF-GLS, the PP and the KPSS tests. The results of the tests for stationarity show that all the sampled variables of the study are generated by a stationary process. Given the results of the different unit root tests, we can assume that the variables in the study are integrated of the order 0 or 1 and none is integrated of the order above 1.

Given that the variables of the study are not integrated of the order 2 we can proceed with the cointegration test. The first step in the NARDL co-integration analysis requires identification of the optimal lag length under the unrestricted vector autoregression. For these purposes we use the Schwarz Criterion (SC), the Akaike Information Criterion (AIC) and the Hannan-Quinn Information criterion (HQ). All the information criteria stand for the lag length of 1 year (Table 1).

Table 1. Results of optimal lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	126.8624	NA	5.43e-11	-12.28624	-12.08709	-12.24736
1	202.5397	113.5160*	1.45e-13*	-18.25397*	-17.25824*	-18.05959*
2	213.3072	11.84423	3.09e-13	-17.73072	-15.93840	-17.38084

Note: * indicates lag order selected by the criterion AIC - Akaike information criterion, SC - Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Source: own calculations

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Then we can proceed to determining the long-run relationships between the variables of the study. To check the variables on the existence of the long-run relationship we employ the bound F-test for Equation 5. The results of the bounds test for the estimated equation are presented in Table 2.

Table 2. Cointegration F-test results

F-statistics	90% LB	90% UB	95% LB	95% UB	99% LB	99% UB
4.42	2.72*	3.77*	3.23*	4.35*	4.29	5.61

Note: Null hypothesis of the ARDL bounds test is: No long-run relationship exists. LB — low bound, UB — upper bound. If the F test statistic falls between lower and upper bounds the result is inconclusive. If it is below lower bound, the null hypothesis cannot be rejected. If the test statistics is above upper bound , the null hypothesis of no co-integration is rejected (*).

Source: own calculations

The results of the cointegration F-test show that the resulting F-statistics are above the upper bound and statistically significant at 10% and 5% significance level. The results show that the sampled variables are cointegrated and the long-run relationship between the variables exists in the Russian case.

Given that the sampled variables are cointegrated in the long-run, we can proceed to the next stage, that requires estimation of the long and short-run coefficients. Given that the NARDL model was estimated in the logarithmic form, we can estimate how a shock in 1% of the explanatory variables affect the dependent variable both in the long and short run.

The estimates for the short-run relationships are presented in Table 3.

Table 3. NARDL short-run results.

Regressor	Parameters	S.E.	t-statistics	p-value
Δ *LCPI +*	0.133810	0.070107	1.908651	0.0733**
Δ *LCPI -*	0.000001	0.103028	0.000009	1.0000
Δ *LGINI*	0.524538	0.504683	1.039342	0.3132
ECMt-1	-0.752844	0.202592	-3.716050	0.0017*
Diagnostic test statistics				
R^2	0.8536			
DW-statistic	2.0235			
F-statistic	6.714			
RSS	0.01			

Note: * and ** denote the rejection of the null hypothesis at the 5% and 10% significance levels respectively. β column reports estimated coefficients.

Source: own calculations

As can be seen from the results of the short-run relationship estimation, the error correction term is negative in sign and statistically significant at 1% level. This result confirms the presence of the co-integration. The value of

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the ECM coefficient is 0.752 that allows to assume that in Russia 75% of the disequilibrium in the carbon dioxide emission is rectified in the short-run given the explanatory variables.

Given the results of the short-run estimates, we can conclude that the only determinant among the selected variables that affect CO2 emissions is a positive shock in corruption. In other words, a 1% increase in corruption perception increases CO2 emissions on 0.13% under 10% significance level. Another interesting result is that a 1% decrease in corruption is not statistically significant at all. Yet, we can assume that only an increase in corruption stimulates environmental degradation in Russia, while a decrease in corruption does not affect the structure of the energy sector. The explanation of such result may lie in the lack of stimuli to support green growth through exploitating renewable energy consumption. Also the short run estimates show that income inequality doesn't play a statistically significant role in explaining CO2 emissions in Russia. However, the results may be alternative if one would decompose the GINI coefficient in positive and negative series.

The picture won't change if we look at the long run estimates of the nARDL model in Table 4.

Table 4. NARDL long-run results.

Regressor	**Parameters**	**S.E.**	**t-statistics**	**p-value**
LCPI +	0.177740	0.081592	2.178408	0.0437*
LCPI -	0.000001	0.136852	0.000009	1.0000
LGINI	0.696743	0.667442	1.043899	0.3111
Diagnostic test statistics				
Test type	***t*-statistics**		***p*-value**	
χ^2_{SC}	1.118		0.520	
χ^2_{FF}	1.437		0.988	
χ^2_{N}	1.174		0.555	
χ^2_{H}	1.577		0.356	

Note: * and ** denote the rejection of the null hypothesis at the 5% and 10% significance levels respectively. β column reports estimated coefficients. χ^2_{SC}, χ^2_{FF}, χ^2_{N}, χ^2_{H}present the Breusch–Godfrey serial correlation LM test, the Ramsey RESET test of functional form misspecification, the Jarque–Bera normality test and the Breusch –Pagan-Godfrey heteroscedasticity test, respectively.

Source: own calculations

As the short run estimates, the long run ones also show that a positive shock in corruption is an important determinants of environmental degradation in Russia. A 1% increase in corruption leads to an almost 0.17% rise in carbon dioxide emission, stressing the importance of institutional quality for sustainable economic growth. The other parameters seem to be of no importance, given their statistical insignificance. The decrease in corruption is found to be statistically insignificant for the purpose of environment preservation. This results show that the main problem of environmental degradation in Russia lies more in technological factors, such as the structure of energy resources, where almost 60% go for coal, gas and oil, rather than in institutional ones.

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The last step in the nARDL approach is estimating the stability of the model. For this purpose, we employ the cumulative (CUSUM) and the cumulative sum of squares (CUSUMSQ) stability tests, proposed by Brown et al. (1975). The results of the CUSUM and CUSUMSQ tests are presented in Figures 1 and 2.

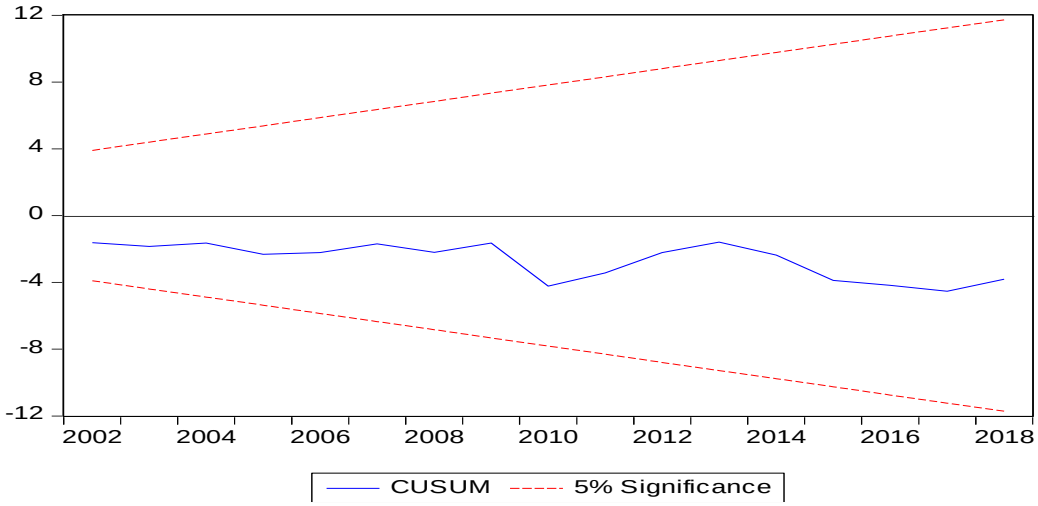

Fig.1. Results of CUSUM test
Source: own calculations

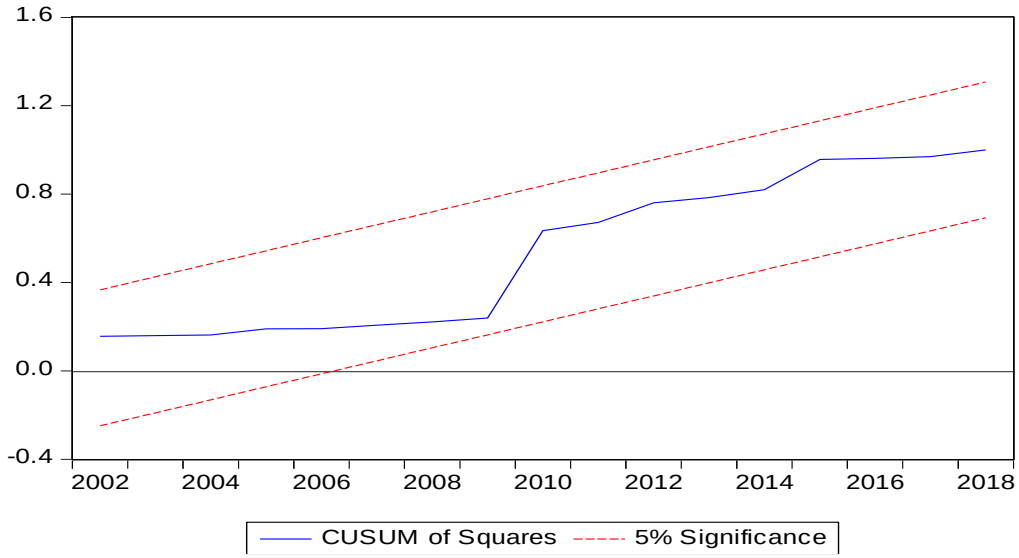

Fig.2. Results of CUSUMSQ test
Source: own calculations

As can be seen from Figures 1 and 2, the plots of the CUSUM and the CUSUMSQ statistics are located within the 5% significance critical bounds, which proves the stability of the developed model.

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5. Conclusion

This paper investigates the impact of income inequality and corruption on carbon dioxide emissions in Russia. Also the paper aims to explore the potential impact of positive and negative shocks in corruptio on carbon dioxide emissions in Russia for the period 1996-2018. The study employs non-linear autoregressive distributed lag approach.

The results show that all the variables are cointegrated in the long run. The results of the long run estimates show that a 1% increase in corruption leads to a 0.13% rise in CO2 emissions in Russia in the short-run, while a 1% increase in corruption in the long run leads to a 0.18% rise in carbon dioxide emissions under 5% significance level. The decrease in corruption is found to be statistically insignificant for the purpose of environment preservation. This results show that the main problem of environmental degradation in Russia lies more in technological factors, such as the structure of energy resources, where almost 60% go for coal, gas and oil, rather than in institutional ones. However, rising corruption negatively affects environmental quality because of high rate of return of non-renewable energy sector. The income inequality is found to be statistically insignificant. However, decomposition of the GINI coefficient for positive and negative shocks may give another results.

The results also reveal the presence of asymmetrical effects of corruption on carbon dioxide emissions and confirm its significance as important determinant of environmental pollution in Russia.

References

Acaravci, A., Ozturk, I. 2010. On the relationship between energy consumption, CO2 emissions and economic growth in Europe. *Energy*, 35(12): 5412-5420. https://doi.org/10.1016/j.energy.2010.07.009

Albiman, M.M., Suleiman, N. &Hamad Omar Baka. 2015. The relationship between energy consumption, CO2 emissions and economic growth in Tanzania. *International Journal of Energy Sector Management*, 9(3): .361-375, https://doi.org/10.1108/IJESM-05-2014-0006

Acheampong, A. 2018. Economic growth, CO2 emissions and energy consumption: What causes what and where?", *Energy Economics*, 74: 677-692. https://doi.org/10.1016/j.eneco.2018.07.022

Al-mulali, U. and Che Normee Binti Che Sab, 2018. Energy consumption, CO2 emissions, and development in the UAE. *Energy Sources*, Part B: Economics, Planning, and Policy, 13(4): 231-236, https://doi.org/10.1080/15567249.2012.689796

Arminen, H. and Angeliki N. Menegaki, 2019. Corruption, climate and the energy-environment-growth nexus. *Energy Economics*, 80: 621-634. https://doi.org/10.1016/j.eneco.2019.02.009

Baek, J. and Gweisah, G. 2013. Does income inequality harm the environment?: Empirical evidence from the United States. *Energy Policy*, 62: 1434-1437. https://doi.org/10.1016/j.enpol.2013.07.097

Bass, A. 2019. Does Electricity Supply Matter for Economic Growth in Russia: A Vector Error Correction Approach? *International Journal of Energy Economics and Policy*, 8(5): 313-318.

Bass, A. 2019. Do institutional quality and oil prices matter for economic growth in Russia: An empirical study. *International Journal of Energy Economics and Policy*, 9(1): 76-83. https://doi.org/10.32479/ijeep.7091

Bozkurt, C. and Y.Akan, 2014. Economic growth, CO2 emissions and energy consumption: the Turkish case. *International Journal of Energy Economics and Policy*, 4(3): 484-494.

Brown, R. L., Durbin, J., Evans, J. M. 1975. Techniques for testing the constancy of regression relations over time. *Journal of the Royal Statistical Society. Series B. Methodological*, 37: 149–163.

Cameron, S. 1994. A review of the econometric evidence on the effects of capital punishment. *Journal of Socio-Economics*, 23: 197-214.

Chang, M.-C. 2015. Room for improvement in low carbon economies of G7 and BRICS countries based on the analysis of energy efficiency and environmental Kuznets curves. *Journal of Cleaner Production*, 99: 140–151. https://doi.org/10.1016/j.jclepro.2015.03.002

Chen, H., Hao, Y. Li, J. and Xiaojie Song, 2018. The impact of environmental regulation, shadow economy, and corruption on environmental quality: Theory and empirical evidence from China, *Journal of Cleaner Production*, 195: 200-214. https://doi.org/10.1016/j.jclepro.2018.05.206

Cole, M.A. 2007. Corruption, income and the environment: an empirical analysis". *Ecological Economics*, 62(3-4): 637-647 https://doi.org/10.1016/j.jclepro.2015.03.002

Tan, C.-C. & Tan, C. 2018. Energy consumption, CO2 emissions and economic growth: a causality analysis for Malaysian industrial sector. *International Journal of Energy Economics and Policy*, 8(4): 254-258.

Dickey, D. A., Fuller, W. A. 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366a): 427–431. https://doi.org/10.1080/01621459.1979.10482531

Dong, X.-Y. & Yu Hao, 2018. Would income inequality affect electricity consumption? Evidence from China. *Energy*, 142: 215-227. https://doi.org/10.1016/j.energy.2017.10.027

Elliot, G., Rothenberg, T., Stock, J. 1996. Efficient tests for an autoregressive unit root. *Econometrica*, 17:143-178.

Farooq, A., Shahbaz, M., Arouri, M., Teulon, F., 2013. Does corruption impede economic growth in Pakistan?. *Economic Modelling*, 35, 622-633.64(4): 813–836. https://doi.org/10.2307/2171846

Fredriksson, P.G., Vollebergh, H. and Dijkgraaf, E. 2004. Corruption and energy efficiency in OECD countries: theory and evidence. *Journal of Environmental Economics and Management*, 47(2): 207-231. https://doi.org/10.1016/j.jeem.2003.08.001

Grunewald, N., Klasen, S., Martinez-Zarzoso, I. and Chris Muris, 2017. The Trade-off Between Income Inequality and Carbon Dioxide Emissions. *Ecological Economics*, 142: 249-256. https://doi.org/10.1016/j.ecolecon.2017.06.034

Hao, Y. Chen, H. and Qianxue Zhang, 2016. Will income inequality affect environmental quality? Analysis based on China's provincial panel data. *Ecological indicators*, 67: 533-542. https://doi.org/10.1016/j.ecolind.2016.03.025

Islam, R., Ahmad Bashawir Abdul Ghani and Emil Mahyudin, 2017. Carbon dioxide emission, energy consumption, economic growth, population, poverty and forest area: evidence from panel data analysis. *International Journal of Energy Economics and Policy*, 7(4): 99-106.

Jabeur, S. & Sghaier, A. 2018. The relationship between energy, pollution, economic growth and corruption: A Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. *Economics Bulletin*, AccessEcon, 38(4): 1927-1946

Kasuga, H. and Masaki Takaya, 2017. Does inequality affect environmental quality? Evidence from major Japanese cities. *Journal of Cleaner Production*, 142(4): 3689-3701. https://doi.org/10.1016/j.jclepro.2016.10.099

Khan, F. and Paul Heinecker, 2018. Inequality and energy: Revisiting the relationship between disparity of income distribution and energy use from a complex systems perspective", *Energy Research and Social Science*, 42: 184-192. https://doi.org/10.1016/j.erss.2018.03.026

Kwiatkowski, D., Phillips, P., Schmidt, P., Shin, Y. 1992. Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics*, 54(1992): 159-178. https://doi.org/10.1016/0304-4076(92)90104-Y

Nejat, P., Fatemeh Jomehzadeh, Mohammad Mahdi Taheri, Mohammad Gohari and Muhd Zaimi Abd. Majid, 2015. A global review of energy consumption, CO2 emissions and policy in the residential sector (with an overview of the top ten CO2 emitting countries). *Renewable and Sustainable Energy Reviews*, 43: 843-862. https://doi.org/10.1016/j.rser.2014.11.066

Ozturk, I. and Ali Acaravci, 2010. CO2 emissions, energy consumption and economic growth in Turkey. *Renewable and Sustainable Energy Reviews*, 14(9): 3220-3225. https://doi.org/10.1016/j.rser.2010.07.005

Pao, H.T., Tsai, C.M. 2010. Multivariate Granger causality between CO2 emissions, energy consumption, FDI (foreign direct investment) and GDP (gross domestic product): Evidence from a panel of BRIC (Brazil, Russian Federation, India, and China) countries Energy, 36 (1): 685-693. https://doi.org/10.1016/j.energy.2010.09.041

Perron P. 1989. The great crash, the oil price shock, and the unit root hypothesis. Econometrica, 57(6): 1361–1401.

Pesaran, M.H., Shin, Y. 1999. An autoregressive distributed lag modeling approach to cointegration analysis. In: Strom S. (ed.): Econometrics and Economic Theory in the 20th Century. Cambridge University Press, Cambridge: 371–413

Pesaran, M.H., Shin, Y., Smith, R. 2001. Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16: 289–326. https://doi.org/10.1002/jae.616

Phillips, P. C., & Perron, P. 1988. Testing for a unit root in time series regression. *Biometrika*, 75(2): 335–346 https://doi.org/10.1093/biomet/75.2.335

Sekrafi, H. & Sghaier, A. 2018. The effect of corruption on carbon dioxide emissions and energy consumption in Tunisia. *PSU Research Review*, 2(1): .81-95, https://doi.org/10.1108/PRR-11-2016-0008

Sekrafi, H. & A. Sghaier, 2018. Examining the relationship between corruption, economic growth, environmental degradation, and energy Consumption: a panel analysis in MENA Region. *Journal of the Knowledge Economy*, 9(3): 963-979. https://doi.org/10.1007/s13132-016-0384-6

Shahbaz, M., Dube, S., Ozturk, I., Jalil, A. 2015. Testing the Environmental Kuznets Curve Hypothesis in Portugal. *International Journal of Energy Economics and Policy*, 5(2): 475-481.

Shahbaz, M., Ozturk, I., Ali, A. 2013. Revisiting the Environmental Kuznets Curve in a global economy. *Renewable and Sustainable Energy Reviews*, 25: 494–502. https://doi.org/10.1016/j.rser.2013.05.021

Shahzad, S.J., Kumar, R., Zakaria, M. & Maryam Hurr, 2017. Carbon emission, energy consumption, trade openness and financial development in Pakistan: A revisit. *Reviews*, 70: 185-192. https://doi.org/10.1016/j.rser.2016.11.042

Shin Y, Yu B, Greenwood-Nimmo M. 2014. Modelling asymmetric cointegration and dynamic multiplier in an ARDL framework. In Festschrift in honor of Peter Schmidt: Econometric Methods and Applications, Eds. Horrace WC, Sickles RC. Springer Science and Business Media, New York, 281–314; ISBN: 1489980075.

World Bank (2019): World Development Indicators. Available at http://databank.worldbank.org/data/views/reports/tableview.aspx?isshared=true

Wang, Z., Danish, Bin Zhang and Bo Wang 2018. The moderating role of corruption between economic growth and CO2 emissions: Evidence from BRICS economies. *Energy*, 148: 506-513 https://doi.org/10.1016/j.energy.2018.01.167

Yang, X., Lou, F., Sun, M., Wang, M., Wang, Y. 2017. Study of the relationship between greenhouse gas emissions and the economic growth of Russia based on the environmental Kuznets curve. *Applied Energy*, 193: 162–173. https://doi.org/10.1016/j.apenergy.2017.02.034

Zhang, Y. Yan-Lin Jin, Julien Chevallier and Bo Shen, 2016. The effect of corruption on carbon dioxide emissions in APEC countries: A panel quantile regression analysis. *Technological Forecasting and Social Change*, 112; 220-227. https://doi.org/10.1016/j.techfore.2016.05.027

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THE ROLE OF BANKS' INNOVATIVENESS IN BUILDING SUSTAINABLE EFFICIENCY: THE CASE OF POLAND*

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Abstract. New technology has already influenced almost all aspect of human life. Innovativeness is considered as one of the most important requirements for both companies and employees. Even such traditional entities like banks should develop their propensity and ability to incorporate changes in business practices through the creation and adoption of new ideas, solutions, and technology. Today, as a result of significant changes on banking markets, the innovativeness becomes one of the condition for banks' sustainability. Strong competition increased by a necessity to compete with new market players requires developing new managers and employees' skills as creativity and intrapreneurship. The purpose of the paper is to investigate to what extent bank's innovativeness impacts a bank's efficiency that lead to sustainable market position. It presents banks' innovativeness among other competitive advantage factors, their assessment from the perspective of their potential in the process of building bank's competitive advantage and a correlation between the level of bank's innovativeness and market efficiency. The majority of the innovativeness research concentrate on developed countries and very little is known about developing, transition countries. Moreover, the few of them explore banks as a specific entity. On the banking market, they focus rather on distribution channels or product innovations. To the best authors' knowledge, this is the first attempt to empirically examine the relationship between a bank's innovativeness and market efficiency in a transition banking market in Europe. The paper uses data retrieved from the research survey. The survey's target group consisted of all retail banks operating in Poland defined as banks that offer a broad range of financial services to different segments of individual customers. The research was conducted under the auspices of the Polish Banks Association. The data was collected by two methods – PAPI (personal and pencil interviews) and CAWI (computer assisted web interviews). The questionnaire was applied to executive managers of retail banks operating on Polish banking market and banks' customers. The data used for assessing banks' efficiency were derived from banks' annual reports. The results provide direction for banks' decision makers concerning innovativeness' factors that should be taken into account in the process of building competitive advantage and sustainable market performance.

Keywords: banks' innovativeness; competitive advantage; knowledge-based intangibles; financial technology; banks' efficiency, market performance

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1. Introduction

Financial technology is thought to be one of the most disruptive factors influencing the banking market all over the world. It is an exciting area of change and development with an unclear impact on banking products, service delivery, and banks' sustainable position on banking market at this time (Walker, 2018). Undoubtedly, today the development of bank's sustainable market position, competitiveness and effectiveness is strictly connected with innovativeness (Aghion, Reenen, & Zingales, 2013, Chava, Oettl, Subramanian & Subramanian, 2013, He & Tian, 2013, Bernstein, 2015, Cornaggia, Mao, Tian & Brian, 2015, Siekelova et al. 2017; Belas et al., 2018). Banks have to be able to create systems that implement new technologies and applications, optimise processes of providing banking products and services, develop financial infrastructure and allow them to exchange information about customers and their behaviour in all distribution channels. It brings new challenges for all banks' employees who should develop new skills such as creativity and intrapreneurship. The traditional attitude to bank's management focused on fulfilling safety regulations might not be enough to face new market challenges (Sullivan, 2009). Lowering the entry barriers and the threats of a necessity to compete with technology-oriented market players (FinTech companies) combined with changes in customers' expectations will require basing banks' market strategy and business models on appropriate factors (First Data Corporation, 2010, Williams & Page, 2011, BMO Wealth Institute, 2014). It is especially important as banks play a special role in society (Xu, Naiwen & Ahmad, 2018). They are crucial in financing the economy, settling payments and providing products that allow other entities to develop their financial and market sustainability. The banking market sustainability influences the financial system stability, the sustainable economic growth, as well as the economy as a whole. Thus banks' position in domestic and worldwide economy make building bank's innovativeness enormously important.

The majority of the innovativeness research concentrate on developed countries and very little is known about transition countries. Moreover, the few of them explore banks as a specific entity. On the banking market, they instead focus on distribution channels or product innovations and their adoption (Akhisar, Tunay & Tunay., 2015, Nekrep, 2013, Norden, Buston & Wagner, 2014, Mullan, Bradley & Loane, 2017, Salampasis & Mention, 2018, Priya, Gandhi & Shaikh, 2018). To the best author's knowledge, this is the first attempt to empirically examine the relationship between a bank's innovativeness and market efficiency in a transition banking market in Europe.

The purpose of the paper is to investigate the contribution of the bank's innovativeness to bank's efficiency that is the foundation for sustainable market position and performance. Achieving the purpose of the paper requires answering the following research questions:

RQ1: What is the importance of a particular bank's competitive advantage factors from the perspective of building sustainable market position?
RQ2: Does a bank's innovativeness influence its sustainable efficiency?

The paper uses a two-fold methodology. The range of assets influencing a bank's competitive advantage and market performance was prepared as a result of a literature review. Then they were verified by empirical research. The strategic assets' structure was verified using a principal axis factor analysis. Afterwards, the impact of verified assets' groups on banks' efficiency was examined.

The remainder of this paper is structured as follows: the first section presents the literature review concerning innovativeness among other bank's competitive advantage factor and their role in bank's sustainable development, the second section considers the competition on the Polish banking market, the third section shows

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the empirical results concerning banks' innovativeness and efficiency. The paper concludes with the summary evidence of the study and its limitations.

2. Bank's innovativeness as competitive advantage factor

Today as never before banks market environment has a crucial impact on banks' business decisions. Many factors make gaining competitive advantage more and more difficult. Among them, the most important is new technology. Its continuously increasing complexity and the development of information and communication's techniques has resulted in a social revolution that has changed customer behaviour and expectations concerning banking services. The technology development has a profound effect on retail banking services all over the world. The primary motivation for using modern technology has been to reduce costs (Delafrooz, Taleghani & Taghineghad, 2013, Persson 2013), increase efficiency, speed, and control of customer-bank interactions (Honebein & Cammarono, 2006). The contemporary motivation is to add value to the overall customer experience (Blount, 2010). In recent years, the technological landscape has been additionally enriched by social media development that has influenced markets, companies, institutions and customers' behaviour and expectations (Kaplan & Heinlein, 2010, Hanna, Rohm & Crittenden, 2011, Papagiannidis & Bourlakis, 2015, Durkin, Mulholland & McCartan, 2015).

Obtaining a sustainable competitive advantage requires developing the bank's innovativeness. The banks' innovativeness is an organisation's propensity and capability to rapidly incorporate change in business practices through creation and/or adoption of new ideas, that decrease costs, reduce risks, and improve product what results in adding value in the form of increased competitiveness and sustainability (Frame & White, 2002, Guimaraes, Brandon & Guimaraes, 2009). It is an aspect of organisational culture that reflects the internal receptivity to new ideas and innovations (Hult, Hurley & Knight, 2004, Menguc & Auh, 2006, Tsai & Yang, 2013). A firm oriented toward innovation makes individuals, teams and management more open to ideas generation, creative, risk-taking and entrepreneurial (Zhou & Wu, 2010; Laužikas & Mokšeckienė, 2013). Following resource-based view (RBV) bank's innovativeness is one of internal resources and capabilities that, if matched appropriately with to environmental opportunities, help organisations to gain sustainable competitive advantage. The basic assumption of RBV is that resources and capabilities are heterogeneous across firms, and the firms that have superior resources gain sustainable competitive advantage (Hamel & Prahalad, 1990, Barney, 1991, Peteraf, 1993, Acur & Bitici, 2004, Cheng, Lin, Hsiao & Lin., 2010, Zubac, Hubbard & Johnson, 2010). Innovation capability includes strategic capability, product development capability, and technological capability (Vicente, Abrantes & Teixeira, 2015). It requires adequate leadership style, efficient customer knowledge management, and proper investment in technology implementation. Thus such a capability results from the efficient management of a bank's strategic resources and concurrently influences the strategic resources (Figure 1).

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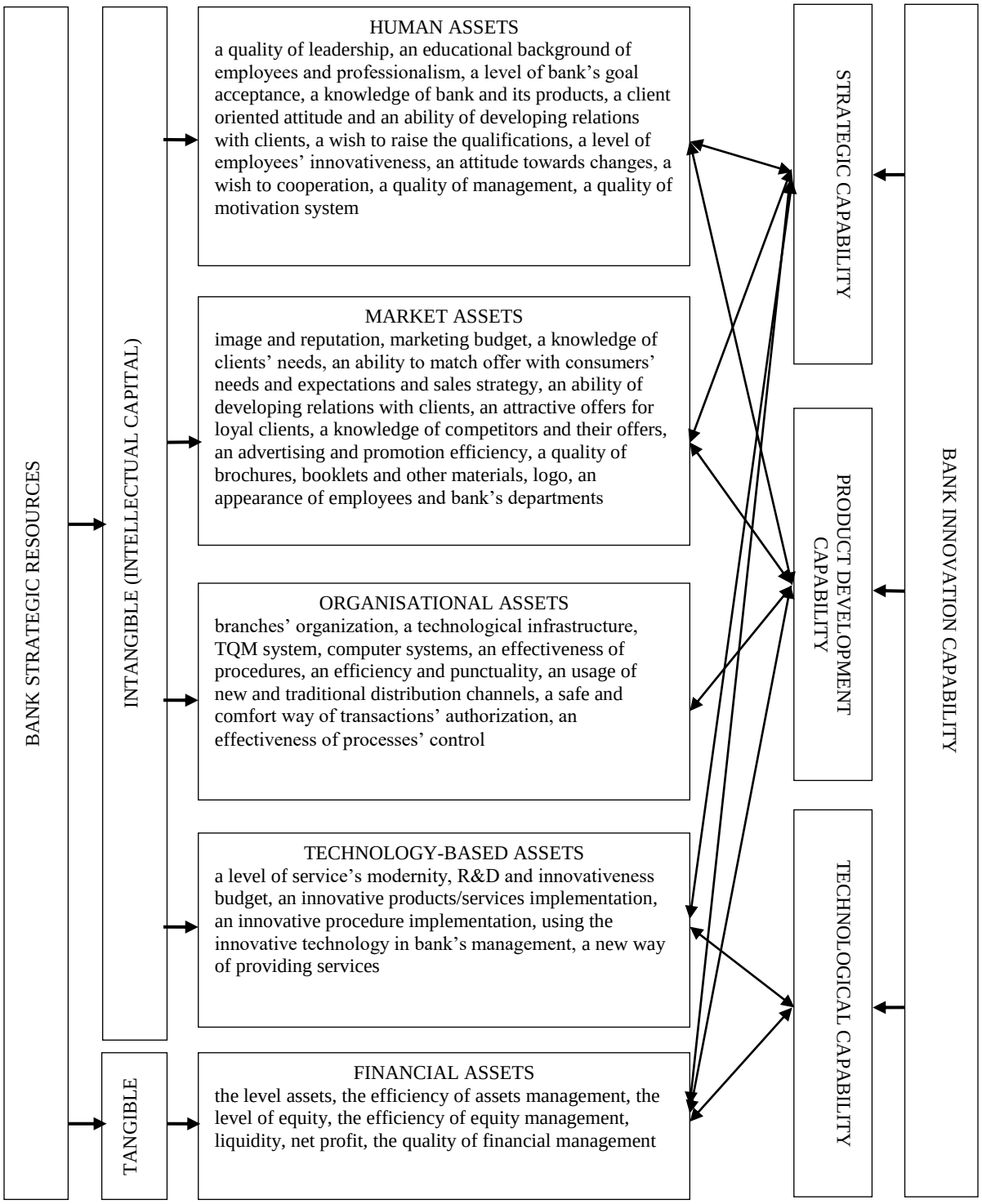

Fig. 1. The relations between bank's strategic resources and innovation capability.
Source: Author's work.

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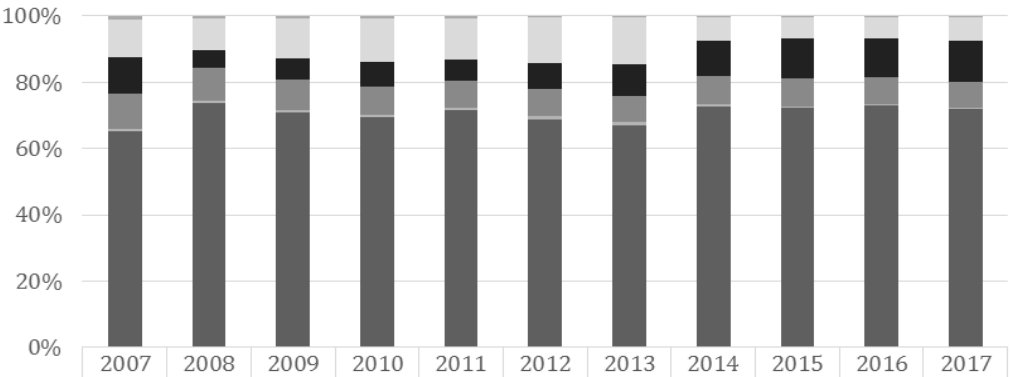
The basic nature of the banking business is knowledge intensive (Mavridis, 2005). The market success to a large extent depends on employees qualifications, engagement, motivation, innovativeness and intrapreneurship. From that perspective, the most important asset category is human capital. Human capital also influences the efficiency of market capital's usage, especially the reputation, long-term relationship with customers and their trust. Concurrently, meeting customers' expectations regarding speed, flexibility, access to banking services and usage convenience, is impossible today without organisational capital. Additionally, during the last few decades, as a result of fast technology development, many financial innovations have been implemented and have become a source of competitive advantage.

Nowadays, banks are allowed to underwrite insurance, while other financial entities are given a possibility to offer some financial products that have been traditionally provided by retail banks (Nejad & Estelami, 2012). The emerge of crowd-funding business models, and the introduction of payment services by companies originating from other sectors have contributed to the alteration of the landscape of the banking industry.

All these developments make banks to rethink their market strategy and business models basing them on the resources which are of strategic importance from the perspective of their ability to create bank's competitiveness and sustainable market performance.

3. The competition on Polish banking market

The banking market plays a significant role in the Polish financial sector. Although the assets of the non-bank financial institution have been systematically growing, the dominant share of the banking sector's assets in the assets of all financial entities remain stable. During the last decade, it has been ranging between 65.3 and 73.0 per cent (Figure 2).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Brokerage Houses	1,0	0,6	0,7	0,6	0,6	0,5	0,4	0,4	0,3	0,3	0,3
Open Pension Funds	11,5	9,8	12,0	13,3	12,4	13,8	14,3	7,1	6,4	6,6	7,3
Invest Funds	11,1	5,4	6,4	7,3	6,5	7,7	9,3	10,5	12,3	11,7	12,2
Insurance Companies	10,5	9,8	9,3	8,7	8,1	8,3	8,0	8,5	8,2	7,9	8,0
Credit Unions	0,6	0,7	0,8	0,8	0,9	0,9	0,9	0,7	0,6	0,5	0,4
Banks	65,3	73,7	70,9	69,4	71,6	68,9	67,1	72,9	72,2	73,0	72,2

Fig. 2. The structure of Polish financial sector's assets.
Source: NBP, 2007-2017.

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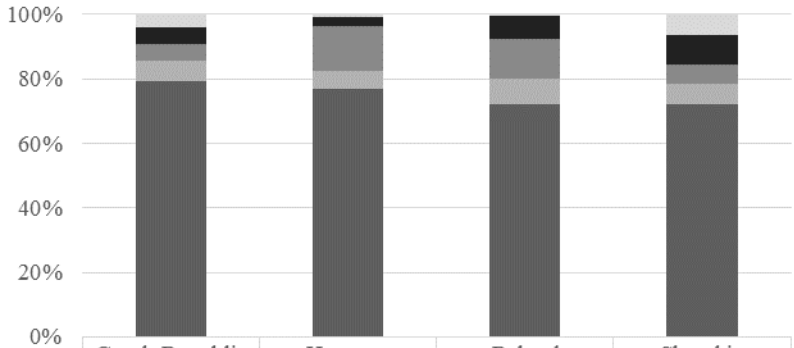
Taking into account the assets' structure, the Polish market is representative for the Middle-East European financial sector (Figure 3) and for most countries in European Union where banking market is the crucial segment of the financial market and banks as financial intermediaries have key functions in the domestic economy.



	Czech Republic	Hungary	Poland	Slovakia
Other	4,0	0,7	0,3	6,5
Pension Funds	5,0	2,9	7,3	8,9
Invest Funds	5,5	13,9	12,2	6,1
Insurance Companies	6,1	5,8	8,0	6,4
Banks and Credit Unions	79,4	76,7	72,2	72,1

Fig. 3. The structure of Middle-East financial sectors' assets.
Source: NBP, 2017.

The Polish banking market consists of commercial banks, credit institutions and co-operative banks. The competition in all segments has appeared in the 90. last century, but the history of the banking sector is dated on the 15th century when the first banking houses were established. Despite the turbulent history and the loss of independence the first issuing bank, called the Polish Bank, stated the activity in 1828. Some banks established at that time are still operating on the Polish banking market. Bank Handlowy, the first commercial bank in Poland, has been operating for a continuous period till now. The other banks, as PKO Bank Polski and PeKaO SA, stopped their activity during the Nazi German occupation and re-established market activity after the Second World War. A centrally planned economy was not conducive to the development of competition and did not require customer-oriented strategy. The bank's market behaviour started to change in 1989 after introducing the new Act of Banking that enabled the establishment of non-state banks in Poland. The market response was immediate. By the end of 1992, there were 54 domestic banks. Since then the process of mergers and acquisitions has become the essential methods for gaining a more significant market share, as well as restructuring some of them. Poland`s entrance to the European Union also resulted in cross-border consolidation (Klimontowicz, 2016). Mergers and acquisitions influence not only the number of banks and the sector's ownership structure but also impact the level of market concentration.

The most frequently used measures of banking market concentration are Herfindahl-Hirschman index (HHI) and concentration ratio (CR5). They are also considered to be an indicator of the level of market competition. Table 1 presents the selected Polish banking market data.

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Table 1. The structural characteristic of Polish banking market

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of banks											
commercial banks	47	49	49	49	47	45	41	38	38	37	35
co-operative banks	581	579	576	576	574	572	571	565	561	560	555
credit institutions	14	18	18	21	21	25	28	28	27	26	28
Banking distribution network											
branches	4 073	4 511	6 507	6 933	7 092	7 534	7 336	7 352	7 230	7 137	6 642
subsidiaries and agencies	5 217	5 789	7 290	7 246	6 802	4 876	5 019	4 872	4 660	4 135	3 815
Number of employees (in thousands)											
	167,2	181,3	175,2	176,9	176,7	175,1	174,3	172,7	170,9	169,3	164,4
Market concentration											
HHI	0,640	0,562	0,574	0,559	0,563	0,568	0,586	0,656	0,670	0,659	0,648
CR5	46,6	44,2	44,2	43,9	44,3	45,0	46,01	48,5	48,8	48,5	47,9

Source: NBP, UKNF 2007-2017

The level of HHI and CR5 ratios shows that the concentration of Polish banking market is relatively low. It is one of the lowest in Europe (Poland is 22nd in Europe) and significantly lower of European Union and Eurozone average (NBP, 2018). The low HHI index and the relatively low market share of big banks enhance the market competition.

Many factors have influenced the intense competition in the Polish banking market. Today, in post-crisis reality it is quite difficult to point out the most important of them (Pawłowska, 2010). The level of competition influence both banks' innovativeness and sustainable market performance (Anning-Dorson, Nyamekye & Odoom, 2017). Banks have already noticed new market players. Most of them do not treat them as crucial rivals, whereas in many worlds markets they are thought to be the biggest threat that may change banks' sustainable market position and the banking market structure (Worthington, 2011).

4. Bank's innovativeness and sustainable market performance

4.1. Research methodology

Bank's innovativeness is strictly connected with its strategic assets. As a category, it results from strategic capacity, product development capacity and technological capacity. The broad range of possible assets that might be the foundation for creating those capacities in the context of gaining competitive advantage and sustainable market performance led to the question what strategic assets have the crucial importance on contemporary banking market in Poland.

The list of potential factors (strategic resources) that influence banks' sustainable competitive advantage and market position was prepared on the basis of a literature review. Then they were verified by empirical research. The research was conducted under the auspices of the Polish Banks Association. The survey's target group consisted of all retail banks operating in Poland defined as banks that offer a broad range of financial services to different segments of individual customers and fulfil all their financial needs and expectation. The questionnaire

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was applied to executive managers of retail banks operating on the Polish banking market. 57 statements in the questionnaire were chosen to examine the significance of particular factors. A seven-point Likert scale from 1 to 7 was used in the research. The importance was graded from 1 which meant that the item is not essential at all to 7 which meant the enormous influence. Reliability analysis for competitive advantage components, measured with Cronbach's alpha, ranged between 0,81 and 0,90 for each construct what confirmed adequate reliability levels for all of the scores. The assets of banks which responded to the questionnaire correspond to 79.5 per cent assets of all retail banks operating in Poland. Two methods collected the data – PAPI (personal and pencil interviews) and CAWI (computer assisted web interviews).

The list of factors was verified using a principal axis factor analysis with varimax rotation. The Principal Axis Factor Analysis (PAF) implemented in HDMD package in R environment was applied (McFerrin, 2015) that is similar to principal components and may be done with a reduced matrix where the diagonals are the commonalities (Revelle, 2015). The principal axis method of factor analysis allows estimating commonalities by iteratively updating the diagonal of the correlation matrix and solving the eigenvector decomposition (McFerrin, 2015).

Due to a particular role in the economy banks' market activity is influenced by many factors of a political, legal, economic, sociological, and technological nature. To examine the relationships between competitive advantage factors and banks' efficiency a multivariate regression analysis was conducted. The efficiency was measured by return on assets (ROA) and return on equity (ROE) indexes. Those indexes are commonly used in industry (Subramanian & Nilakanta, 1996) and service research (Akhisar, Tunay & Tunay., 2015; Xu, Naiwen & Ahmad, 2018). The data were derived from banks' annual reports dated from 2012 till 2016. The relationship between factors which constitute banks' innovation capability and their efficiency were analysed using a regression model.

4.2. Results

The theoretical construct combining banks' strategic resources and innovation capability was the foundation for the list of strategic factors that potentially influence banks' sustainable competitive advantage and market position. The list consisted of 57 statements referring to human, market, organisational, technology-based and financial aspect of banking activity and its innovation capability. The factor analysis resulted in the identification of four dimensions of factors that correspond to strategic assets and banks' innovation capability.

The first dimension has loadings from all factors related to the bank's product development and technological capacity and includes items allowing a bank to serve the right products in the right place and at the right time. It incorporates the factors influencing both the product (service) and the process innovations.

The second dimension represents the strategic capability factors. It is worth to stress that the most significant factors are connected with the quality of leadership and management. These and other factors influence the organisational culture and employees' work conditions.

All the analysed factors representing financial aspects of banks' market activity had noticeably high loadings on the third dimension. From the perspective of the bank's innovativeness and sustainability, they are the source of financing the process of implementing the innovations and the foundation for sustainability.

The analysis of the last dimension's factors leads to the conclusion that banks' competitive advantage and sustainable market position is strictly connected with employees' knowledge, experience, progressive attitude and their intrapreneurship.

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The pattern matrix of the empirical strategic resources' item is shown in Table 2. Only items with a factor loading at least 0.60 were considered. Factor loadings of less than 0.6 have been deleted. Four factors of presented items account for 79% of the variance, with factor 1 which explains 24% of the total variance. The verified structure of banks' strategic resources includes 38 items. Reliability test on the factor groupings confirms good results achieved.

Table 2. The pattern matrix for banks' innovation capability

Factors	Product development & technological capability (PD&TC)	Strategic capability (SC)	Financial capability (FC)	Human resources capability (HRC)
The level and efficiency of assets.			0.77	
The level and efficiency of equity.			0.89	
The sources of funding.			0.94	
Net profit.			0.87	
Liquidity/			0.82	
The quality of financial management.			0.80	
The level of service modernity.	0.89			
The implementation of innovative products.	0.78			
The implementation of innovative procedures.	0.80			
Using technology in bank's management.	0.79			
The quality of leadership.		0.88		
The number of employees.	0.66			
Educational level of employees.				0.63
Professionalism.				
The employees' identification with bank's objectives.				0.88
The level of knowledge regarding a bank and its offer.				
Customer-oriented attitude.				0.78
The ability to develop long-term relations with clients.				0.77
The willingness to self-development.				0.75
The level of employees' innovativeness.				0.68
The will to cooperation and knowledge sharing.		0.76		
The quality of executive management.		0.94		
The quality of mid-level management.		0.97		
The level of managers' acceptance.		0.95		
The quality of motivation system.		0.84		
The number of branches.	0.60			
The number of ATMs.	0.77			
The branches' organisation and working hours.				0.88
Employees' equipment.		0.73		
Internal IT systems and procedures.				
The level of quality management.				
The effectiveness of procedures.		0.69		
User-friendly procedures.		0.68		
Efficiency and timeliness of services	0.78			
The usage of traditional distribution channels.	0.93			
The usage of modern distribution channels.	0.91			
The safe and comfortable way of transactions' authorisation.	0.89			
The effectiveness of internal control.				
The knowledge of clients' needs.		0.74		
Matching products to clients' needs.				

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The ability to develop long-term relations with customers.				0.65
Interesting proposals for customers.				
The understanding of competitors.			0.78	
Brand value			0.73	
Branches' appearance.				0.68
% of explained variance	24	22	18	16
Cumulative % of explained variance	24	46	63	79

Source: Author's work.

The relationship between factors which constitute banks' innovation capability and their efficiency were analysed using a regression model. The following equations show regression models:

Model 1: $ROE = \beta_0 + \beta_1 (PD\&TC) + \beta_2 (SC) + \beta_3 (FC) + \beta_4 (HRC) + e$

Model 2: $ROA = \beta_0 + \beta_1 (PD\&TC) + \beta_2 (SC) + \beta_3 (FC) + \beta_4 (HRC) + e$

Models were estimated for ROE and ROA from 2012 till 2016. Table 3 presents the regression results only for 2013 as any significant positive relation has been observed in the subsequent years.

Table 3. Regression results

	Model 1	**Model 2**
Intercept	10,940*** (10,30580)	1,112 (5,236)
PD&TC	0,493 (0,443)	-0,026 (-0,117)
SC	2,938** (2,639)	0,346 (1,553)
FC	3,684** (3,309)	-0,230 (-1,034)
HRC	1,381 (1,241)	0,329 (1,477)
Adjusted. R^2	0,610	0,143
F-value	4,914	1,420
Significance	0,0421	0,333

Notes: ***, **, and * denote statistical significance at the 1, 5, and 10 per cent levels respectively. The figures in the parentheses are the t-statistics.

Source: Author's work.

The results of the regression analysis show that there was a significant positive correlation between banks' innovation capability based on strategic capability and financial capability and their efficiency measured by ROE. Concurrently, there is no a significant correlation between any innovativeness' dimension and the efficiency of assets' management measured by ROA.

Discussion and conclusions

During the last few decades, the Polish banking market has changed remarkably. Opening the market for foreign investors has increased the number of bank and credit institutions. The assets of the Polish banking market has been systematically growing and has become one of the most competitive markets in Europe. Although the new market player has already entered the banking market, banks remain the most crucial market player with over 70

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per cent of market assets share. Such a situation correspond to other banking markets in Europe. The market condition has made banks to search for factors enabling them gaining competitive advantage.

The factors analysis proved that in contemporary economy banks should base building competitive advantage and sustainability on those strategic resources that are strictly connected with their innovation capability. Among them, the most important are those that allow a bank to improve products, services and processes. The findings are relevant to Shih (2008) who recognised the importance of innovations and IT. The results correspond with some previous research conducted on the banking market and others markets that showed the dominance of human capital and employees incentives (Blazevic & Lievens, 2004, Jong & Hartog, 2007, Curado, 2008, Liao, Chen, Hu, Chung & Liu, 2017, Davydenko et al, 2017; Atkočiūnienė, Praspaliauskytė, 2018; Waheed, Kabiru & Umair, 2018) and the impact of strategic management on the ability to create long-term relationship with customers and value creation (Kianto, Andreeva & Pavlov, 2013). Such an ability is the heart of open and user-driven innovation approaches (Hoffmann & Prause, 2015).

The regression analysis proved the importance of strategic capability for the bank's efficiency of equity management. The second factor that impacts the bank's efficiency includes financial parameters as the level of equity, the level of assets, profits and liquidity. The results gave no evidence for a direct correlation between any of competitive advantage factors and the efficiency of asset management. They correspond to the research conducted by Nekrep (2013) that did not prove the influence of a bank's internal innovation capability on their market performance.

The results provide that building innovation capability is strictly connected with organisational culture and require specific leadership encouraging employees to be creative, entrepreneurial and motivated to create long-term relations with customers. Concurrently, the findings indirectly proved the complex character of factors influencing banks' market performance and show that it is difficult to extract particular factors influencing banks' sustainable market efficiency. It may be an inspiration for further research aimed to build a model taking into account both external and internal factors influencing banks' sustainable market efficiency and performance.

The practical implication of the finding is the recommendation for banks' decision makers to base their market strategies only on factors that help to gain a long-term sustainable competitive advantage, market performance and efficiency. As those factors are related to fulfilling customers' needs and expectations, such a market attitude will also be beneficial for society and economy.

As many factors influence the bank market performance, the scope of the research might be its limitation. Although the Polish banking market is one of the most competitive and stable banking markets in Europe, the results cannot be directly extrapolated to other banking markets.

References

Acur, N. & Bitici, U. 2004. A Balanced Approach to Strategy Process. *International Journal of Operations & Production Management*, 24 (4): 388-408.

Aghion, P., Reenen, J., & Zingales, L. 2013. Innovation and institutional ownership. *American Economics Review*, 103: 277–304.

Akhisar, I., Tunay, K. B., & Tunay, N. 2015. The Effects of Innovations on Bank Performance: The Case of Electronic Banking Services. *Procedia - Social and Behavioral Sciences* 195: 369 – 375.

Anning-Dorson T., Nyamekye M. B. & Odoom R. 2017. Effects of regulations and competition on the innovativeness-performance relationship: Evidence from the financial services industry. *International Journal of Bank Marketing*, 35 (6): 925-943, https://doi.org/10.1108/IJBM-06-2016-0079

Atkočiūnienė, Z., Praspaliauskytė G. 2018. The influence of intellectual capital and knowledge management on organizational performance in Lithuanian software companies. Online ISSN 2424-6166. Ekonomika, 98(2): 1-15. https://doi.org/10.15388/Ekon.2018.2

Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120.

Belas, J., Gavurova, B., Kocisova, K., Delibasic, M. 2018. The Relationship between Asset Diversification and The Efficiency of Banking Sectors in EU Countries, *Transformations in Business & Economics*, 17, 3C(45C): 479-496

Bernstein, S. 2015. Does going public affect innovation? *The Journal of Finance*, 70: 1365–1403.

Blazevic, V., & Lievens, A. 2004. Learning during the New Financial Service Innovation Process: Antecedents and Performance Effects. *Journal of Business Research*, 57: 374-391. https://doi.org/10.1016/S0148-2963(02)00272-2

Blount Y. 2010. Employee management and service provision: a conceptual framework. *Information Technology and People*, 24(2): 134-157.

BMO Wealth Institute 2014. *Wealth Generation. The Financial Challenges for Generations X & Y*, BMP Wealth Institute Report, Canadian Edition, www.bmo.com/wealthinstitute, 3-7.

Chava, S., Oettl, A., Subramanian, A., & Subramanian, K.V. 2013. Banking deregulation and innovation. *Journal of Financial Economics*, 109(3): 759–774.

Cheng, M.-Y., Lin, J.-Y., Hsiao, T.-Y. & Lin T. W. 2010. Invested resources, competitive intellectual capital and corporate performance. *Journal of Intellectual Capital*, 11(4): 433-450.

Cornaggia, J., Mao, Y., Tian, X., & Brian, W. 2015. Does banking competition affect innovation? *Journal of Financial Economics*, 189–209.

Curado, C. 2008. Perceptions of knowledge management and intellectual capital in the banking industry, *Journal of Knowledge Management*, 12(3): 141 – 155.

Davydenko, V. A., Kaźmierczyk, J., Romashkina, G. F. & Żelichowska, E. 2017. Diversity of employee incentives from the perspective of banks employees in Poland – empirical approach, *Entrepreneurship and Sustainability Issues, Entrepreneurship and Sustainability Issues*, 5(1): 116-126. http://doi.org/10.9770/jesi.2017.5.1(9)

Delafrooz N., Taleghani M. & Taghineghad M. 2013. The impact of service innovation on customer satisfaction. *International Journal of Marketing and Technology*, 3(5): 127-144.

Durkin M., Mulholland G. & McCartan A. 2015. A socio-technical perspective on social media adoption: a case from retail banking, *International Journal of Bank Marketing*, 33 (7): 944 – 962.

First Data Corporation. 2010. *Tapping Into Generation Y: Nine Ways Community Financial Institutions Can Use Technology to Capture Young Customers*, A First Data White Paper, 2-7.

Frame, W. S. & White, L. J. 2002. Empirical Studies of Financial Innovations: Lots of Talk, Little Action?, *Federal Reserve Atlanta Working Paper*

Guimaraes, T., Brandon, B., & Guimaraes, E. R. 2009. Empirically Testing Some Major Factors for Bank Innovation Success. *Journal of Performance Management*, November 2009: 20-34.

Hamel, G. & Prahalad C. K. 1990. The Core Competence of Corporation. *Harvard Business Review*, May-June 1990: 79-91.

Hanna, R., Rohm, A. & Crittenden, V. L. 2011. We're all connected: The power of the social media ecosystem, *Business Horizons*, 54: 265-273.

He, J., & Tian, X. 2013. The dark side of analyst coverage: the case of innovation. *Journal of Financial Economics*, 109(3): 856–878.

Hoffmann, T. & Prause, G. 2015. How to keep open-source based innovation approaches sustainable: a view from the intellectual property perspective, *Entrepreneurship and sustainability* issues, 2(3): 133–141. http://dx.doi.org/10.9770/jesi.2014.2.3(2)

Honebein P. C. & Cammarano R. F. 2006. Customers at work. *Marketing Management*, 15(8): 26-31.

Hult, G. T. M., Hurley, R. F., & Knight, G. A. 2004. Innovativeness: its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5): 429-438.

Jong, J. P. J. & Hartog D. N. D. 2007. How leaders influence employees' innovative behavior. *European Journal of Innovation Management*, 10(1): 41-64.

Kaplan A.M. & Haenlein M. 2010. Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1): 59-68.

Kianto, A., Andreeva, T. & Pavlov, P. 2013. The impact of intellectual capital management on company competitiveness and financial performance, *Knowledge Management Research & Practise*, 11: 11-122.

Klimontowicz, M. 2016. Knowledge as a Foundation of Resilience on Polish Banking Market. *The Electronic Journal of Knowledge Management*, 14(1): 60-74.

Laužikas, M. & Mokšeckienė, R. 2013. The role of creativity in sustainable business, *Journal of Entrepreneurship and Sustainability Issues*, 1(1): 10–22. http://dx.doi.org/10.9770/jesi.2013.1.1(2)

Liao, S.-H., Chen, C.-C., Hu, D.-C., Chung, Y.-C. & Liu, C.-L. 2017. Assessing the influence of leadership style, organizational learning and organizational innovativeness. *Leadership & Organization Development Journal*, 38(5): 590-609.

Mavridis, D. 2005. Intellectual capital performance drivers in the Greek banking sector. *Management Research News*, 28(5): 43-62.

Menguc, B. & Auh, S. 2006. Creating a firm-level dynamic capability through capitalizing on market orientation and innovativeness. *Journal of the Academy of Marketing Science*, 34(1): 63-73.

McFerrin, L. 2013. HDMD: Statistical Analysis Tools for High Dimension Molecular Data (HDMD). R package version 1.2. Available at http://cran.rproject.org/web/packages/HDMD/index.html

Mullan, J., Bradley L. & Loane S. 2017. Bank adoption of mobile banking: stakeholder perspective. *International Journal of Bank Marketing*, 35 (7): 1154-1174 https://doi.org/10.1108/IJBM-09-2015-0145

Nejad, G. M., & Estelami, H. 2012. Pricing Financial Services Innovations. *Journal of Financial Services Marketing*, 17(2): 120-134. Available at SSRN: https://ssrn.com/abstract=2722013

Nekrep, M. 2013. Innovativeness of banks and insurance companies in developing markets: guidelines for success. *Our Economy*, 59(3-3): 39-49.

Norden, L., Buston, C., & Wagner, W. 2014. Financial Innovation and bank behaviour: Evidence from credit markets. *Journal of Economic Dynamics & Control*, 43: 130-145.

Pawłowska M. 2010. *Konkurencja na polskim rynku bankowym na tle zmian strukturalnych i technologicznych – wyniki empiryczne*, [Competition on the Polish banking market against the background of structural and technological changes - empirical results] [in:] *Bank na rynku finansowym*, ed. Miklaszewska E., Oficyna Ekonomiczna Wolters Kluwer Polska Sp. z o.o., Warsaw, 385.

Persson A. 2013. Profitable customer management: reducing costs by influencing customer behavior. *European Journal of Marketing*, 47 (5/6): 857-876.

Peteraf, M. A. 1993. The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal*, 14(3): 179-191.

Priya, R., Gandhi, A. V. & Shaikh A. 2018. Mobile banking adoption in an emerging economy: An empirical analysis of young Indian consumers. *Benchmarking: An International Journal*, 25 (2): 743-762, https://doi.org/10.1108/BIJ-01-2016-0009

Revelle W. 2016. An introduction to psychometric theory with applications in R. Springer Working Draft. Available at http://personality-project.org/r/book.html

Rozwój systemu finansowego w Polsce [Development of the financial system in Poland], NBP 2007-2017 www.nbp.pl

Siekelova, A., Kliestik, T.Svabova, L., Androniceanu, A., Schönfeld, J. 2017. Receivables management: The importance of financial indicators in assessing the creditworthiness. *Polish Journal of Management Studies*, 15(2): 217-228. https://pjms.zim.pcz.pl/resources/html/article/details?id=156525

Salampasis, D.G. & Mention, A-L. 2018. Open innovation in financial institutions: individual and organisational considerations. *Int. J. Transitions and Innovation Systems*, 6(1): 62–87.

Shih, K.H. 2008. Is e-banking a competitive weapon? A causal analysis. *Internal Journal of Electronic Finance*, 2(2): 180-96.

Sullivan, M. B. 2009. Post Crisis, Innovation Will Rule. *ABA Banking Journal*, April 2009, 30-32.

Subramanian A. & Nilakanta S. 1996. Organizational innovativeness: exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance. *Omega*, 24(6): 631-647.

Tsai, K.-H., & Yang, S.-Y. 2013. Firm innovativeness and business performance: the joint moderating effects on market turbulence and competition. *Industrial Marketing Management*, 42(8): 892-902.

Vicente, M., Abrantes, J. L. & Teixeira M. S. 2015. Measuring innovation capability in exporting firms: the INNOVSCALE. *International Marketing Review*, 32(1): 29-51.

Waheed, A. U., Kabiru, M. K. & Umair, A. 2018. Corporate entrepreneurship and business performance: The moderating role of organizational culture in selected banks in Pakistan, *PSU Research Review*, 2(1): 59-80, https://doi.org/10.1108/PRR-12-2016-0011

Walker, A. 2018. Preface, *The FinTech Edition*, 1-2.

Williams, K. C., & Page A. R. 2011. Marketing to Generation, *Journal of Behavioral Studies in Business*, 3, April 2011, http://www.aabri.com/jbsb.html

Worthington, S. 2011. Banking without the Banks. *International Journal of Bank Marketing*, 29(2): 190-201.

Zhou, K. Z. & Wu, F. 2010. Technological capability, strategic flexibility, and product innovation. *Strategic Management Journal*, 31 (5): 547-561.

Xu, J. X., Naiwen, L. & Ahmad, M. I 2018. Banking performance of China and Pakistan, *Entrepreneurship and Sustainability Issues* 5(4): 929-942. http://doi.org/10.9770/jesi.2018.5.4(16)

Zubac, A., Hubbard, G. & Johnson L. W. 2010. The RBV and Value Creation: a Managerial Perspective. *European Business Review*, 22(5): 515-538.

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STUDY OF SECTOR-SPECIFIC INNOVATION EFFORTS: THE CASE FROM RUSSIAN ECONOMY*

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Abstract. Accelerated introduction of digital technology has recently become one of the key areas in development of Russian economy. The paper presents the approach to innovation intensity assessment by sector and economic activity. The method makes it possible to identify the growth intensity for an output of innovative products. This serves as an indicator of introduction of new technologies and a transition to a more high-tech conversion. The narration assumes that innovations in various sectors are unstable and uneven. There is an observation that there was the highest efficiency increase over the period under review in production and distribution of electrical power, gas, and water, and in other low-tech sectors (primarily, food production). There is a highly intensive character of innovations observed in high-tech and medium-tech sectors. There is another observation that the reasons for the unstable and multidirectional dynamics are as follows: high dependence of efficiency and intensity of innovations on external economic shocks, significant impact made by measures of state support on intensity of innovations, concentration of innovating at large-scale Russian and transnational companies. The results obtained led to the conclusion on a need in more stimuli for national demand from the part of Russian businesses for innovations, including digital technology.

Keywords: innovation, industrial economy, investments, competitiveness, levels of technological conversion, structural transformation of economy.

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1. Introduction

The development of digital economy in the past few years has become a priority development area. The next transformation wave in the society as its cause has the implementation of the so-called *end-to-end* digital technologies of the last generation (Vlasov *et al.*, 2018). It is possible to describe artificial intelligence, the Internet of things, robotics, wireless solutions and other technology with such scale and impact potential that, according to some estimates, they might contribute to a growth of 40% (WEF, 2018). Labour productivity and their effective application will determinate global competitiveness of companies and countries.

Despite the fact that the scheduled vector of development in Russian economy and set tasks of a transition to the newest technology of digital economy deserve an unconditional support, digitalization experience in foreign countries shows that accelerated introduction of digital technology is successful despite encounters some issues (Abdrakhmanov *et al.*, 2019). It is usually and only possible to implement the set tasks if a number of fundamental conditions has been met. (A) There are established development strategies in place that assume a fundamental change in ways of organization and operations through intensive introduction of digital technology. (B) In a country, there is a sector of the process-related supply in place able at least to transfer and adjust overseas digital solutions. (C) There is a growing demand for digital technology from production sectors of economy.

In this vein, an analysis of preparedness of Russian economy for digitalization and building of a comprehensive industrial digital environment has become currently central. Therefore, a purpose of this paper is an estimate of intensity that innovations have in various sectors of Russian economy against relevant indicators.

2. Review of literature

Innovating as a priority for development of Russian economy has become relatively recently a central issue. Management of innovations requires knowledge of their regularities, challenges, and specifics by sector. Official statistics for Russia contains an extremely limited number of indicators that describe innovating. Many researchers pay attention to limited data on the technological development in a number of sectors (Spitsin, 2010; Barinova *et al*., 2018, etc.). Methodology-related challenges obstruct a comparative sector-specific analysis due to a lack of a shared approach to measurements of innovation intensity (Starodubova & Misbakhova, 2016; Lavrovsky, 2018; Motova, 2016).

The academic mainstream has consolidated the idea that digital innovations are the most important lever to address current economic challenges. Researchers are exploring digital economy from various perspectives. They consider digital transformation phenomenon in terms of principles, infrastructure support, institutional foundations, etc. (Istomina, 2018). They generally accept that digital technological changes are a main trigger for the today's economic growth that contributes to higher labour productivity. Experts generally agree that it is digital technologies that will determinate a shape of future economy (Blinkin, *et al*., 2019).

An economic effect of digitalization in industry is diverse and spreads over technical processes, production arrangements, applications of tools of labour. Applications of digital technologies in a number of sectors might contribute to a higher number of enterprises owing to a less number of entry barriers to new markets. Such a trend is clear from dynamics of a number of companies in technologically challenging sectors of economy (for details, see Kuzmin, 2018; Kuzmin & Guseva, 2016). At the same time, there might be also a risk of market monopolization and appearance of new barriers to the development of small and medium-sized businesses (Brynjolfsson *et al*., 2008; Litau, 2018a; Litau, 2018b; Tvaronavičienė, 2018). Barinova *et al*. (2018) provided a detailed analysis of significant characteristics of the development of technologically challenging sectors of Russian economy, as well as limitations for their development. Goraeva and Shamina (2014) developed the

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methodology to measure the development of high-tech economic activities based on the application of the sector wide approach.

Lavrovsky (2018) proposed the approach that enables measuring and evaluating of innovation intensity based on an assessment of investment efforts and indicators of labour performance dynamics caused by them. Motova (2016) proposes to evaluate innovations with the cluster approach by a given set of indicators. They include the growth in a number of enterprises showing innovative activity, higher number of their employees, higher costs for R&D in the field of innovations, higher costs and a larger share of costs for design, higher costs and a larger share of costs for investments in machinery and equipment in a structure of costs for technological innovations, higher output of innovative products, higher ratio between the output of innovative products and costs for technological innovations. Cluster distribution of explored objects following the method by Motova is achieved from a deviation of an average value of an indicator in the cluster from an average value across the entire set of objects. That makes it possible to identify leaders.

Starodubova and Misbakhova (2016) propose to do a quantitative measurement of innovations by economic activities using four indicators. They include growth rates of an output of shipped goods, proportion of innovative products against all the shipped goods, proportion of innovation organizations in a total number of organizations; growth rates of costs for technological innovation. At the same time, in accordance with the approach proposed by authors, the innovative activity gets higher as far as: (a) growth rates of the volume of the shipped innovative goods and growth rates of costs for technological innovations approach 150%; (b) share of innovative products of all the shipped goods approaches 40%; and (c) share of organizations that innovate approaches 35% in a total number of organizations.

The reviewed methods for an estimate of the innovation potential in economy have significantly contributed to a study of innovations at a meso-level. However, so far, the issue of evaluation with regard to intensity and efficiency of innovations in certain sectors has been not explored enough. Support to priority areas of economic development requires an accessible and simple tool to select and justify promising innovations, carry out monitoring of innovations in certain sectors.

3. Materials and Methods

The research was based on official data as provided by the research information base of the Federal State Statistics Service of Russia (Rosstat). Evaluation of innovations of enterprises was based on proposed indicators.
To separate types of economic activity within the manufacturing industry by their technological development, we follow the approach by Rosstat (Rosstat Order of January 14, 2014 No. 21) applied until 2018. Currently, there is a new approach (Rosstat Order of December 15, 2017 No. 832) in use, developed by grouping of high-tech and medium-tech levels by Eurostat in NACE Rev.2 (Eurostat), taking into account OECD recommendations (Galindo-Rueda and Verger, 2016) and specifics of national economy.

In compliance with all of the above mentioned approaches, there are 4 groups of industries: high-tech (ratio between costs for R&D and added value cost is at least 8%), medium-tech of the high level (ratio between costs for R&D and added value cost is 2.5%-8%), medium-tech of the low level (ratio between costs for R&D and added value cost is 1.0%-2.5%) and low-tech industries (ratio between costs for R&D and value added cost is 0%-1%).

In Russian practice, a key criterion for grouping of industries by signs of technological development and classification as a high-tech sector of economy is intensity of research in it, due to limited data on other possible indicators of technological development.

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The intensive development in an industry depends on a growth of return on a use of available resources and investments, while the extensive development in the industry is dependent on an increase in costs and volumes of raised resources (Dahdueva, 2011).

Innovation efficiency (E_{IA}) one might find as a ratio between a result from innovations (Q_{IA}), determined by volume of shipped innovative products and costs for technological innovations (C_{IA}):

$$E_{IA} = \frac{Q_{IA}}{C_{IA}}. \quad (1)$$

An increment rate of indicators of innovations' result is a velocity of ongoing changes:

$$R_{Q_{IA}} = \frac{Q_{IAi} - Q_{IA(i-1)}}{Q_{IA(i-1)}}, \quad (2)$$

where $R_{Q_{IA}}$ is an increment rate for a result of innovations, Q_{IAi} is a shipping volume of innovative products by branch, i is a period of time (year).

$$R_{C_{IA}} = \frac{C_{IAi} - C_{IA(i-1)}}{C_{IA(i-1)}}, \quad (3)$$

where $R_{C_{IA}}$ is an increment rate for costs for technological innovations, C_{IAi} is costs for technological innovations.

$$R_{E_{IA}} = \frac{E_{IAi} - E_{IA(i-1)}}{E_{IA(i-1)}}, \quad (4)$$

where $R_{E_{IA}}$ is an increment rate for innovation efficiency, E_{IAi} is innovation efficiency.

The increment rate of efficiency might serve as a measure of innovation intensity. The higher the value of this indicator is, the more the higher output of innovative products exceeds the increase in costs and vice versa. If the indicator of the increment rate of innovation efficiency takes a negative value, this might mean extensification of the innovative product output.

Digital technologies are distinct by their ability to make labour productivity higher in a many-fold manner and, hence, the output, ceteris paribus. Thus, in the sectors of economy, in which digital technologies are being introduced and applied, we should observe higher efficiency of innovations.

Let us introduce the concept of an intensity indicator for innovations (I_{IA}), considered as a ratio between the growth rate of innovation efficiency and growth rate of costs for technological innovations:

$$I_{IA} = \frac{\frac{E_{IA_t}}{E_{IA_{t-1}}}}{\frac{C_{IA_t}}{C_{IA_{t-1}}}}. \quad (5)$$

If the efficiency growth rate exceeds the costs' growth rate, one may conclude of the predominantly intensive growth in an output of innovative products, which is typical for the newest technologies, including digital ones. Otherwise, there is an extensive growth of innovative products, mainly due to increased costs with limited introduction of breakthrough solutions.

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4. Results

The assessment of intensity of innovations in industries and certain types of economic activity was done using indicators of a volume of shipped innovative products and costs for technological innovations (Tab. 1). Note that intensity of costs for R&D in some sectors of Russian economy was significantly lower than the levels defined by OECD. In other words, even the most high-tech industries in Russia are less advanced than the same in the countries that apply the OECD approach. Moreover, in itself, the fact that a company has a particular type of activity does not say anything of its actual innovative activity. For instance, pharmaceutical companies in Russia often only pack products made by other countries instead of the development of new products or their production (Barinova, Zemtsov & Lanshina, 2018).

Table 1. Results and costs of innovations in sectors and industries of Russian economy in 2012-2017

Industries and economic activities	2012	2013	2014	2015	2016	2017
Volume of shipped innovative products, works, and services, billion roubles						
Mineral production	522.89	523.21	648.53	368.40	419.98	489.45
Manufacturing industries, total, including	1,973.54	2,518.62	2,362.39	2,856.25	3,196.99	2,832.80
high-tech and medium-tech of the high level	992.66	1,164.91	1,047.39	1,096.49	1,185.85	1,341.03
medium-tech of the low level	292.93	344.90	408.36	464.42	415.98	1,112.64
low-tech, including	121.30	158.42	222.70	275.80	305.60	379.14
food production	113.18	127.82	180.28	209.29	236.95	316.66
Production and distribution of electric power, gas, and water	13.18	30.70	26.49	33.60	106.72	80.80
Research and development	283.96	344.65	464.19	482.30	517.93	605.65
Agriculture					22.22	28.45
Costs for tech innovations, RUB bln						
Mineral production	87.78	94.53	123.90	125.58	136.70	184.81
Manufacturing industries, total, including	430.46	580.12	565.58	563.49	574.15	610.22
high-tech and medium-tech of the high level	155.08	226.83	214.15	242.91	279.05	224.12
medium-tech of the low level	211.21	271.06	276.83	226.51	188.85	307.74
low-tech, including	31.71	43.84	35.57	27.56	40.64	78.36
production of foods	16.91	29.97	25.86	20.14	26.08	50.71
Production and distribution of electric power, gas, and water	65.43	72.14	73.29	46.69	66.66	53.02
Research and development	226.78	289.46	387.83	383.50	416.73	468.87
Agriculture	-	-	-	-	14.83	15.81

Source: computed by the author from Rosstat (2019)

As calculations have shown, efficiency of innovations in various sectors of economy is extremely unstable and uneven (Fig. 1). In 2012-2015, lower efficiency of innovations in mineral production was followed by a slow growth in 2016, but as early as in 2017, dynamics of efficiency showed a downward trend again. There is also a similar change in trends from downward to upward and again to downward that we observe in the manufacturing industry. However, in high-tech and medium-tech industries of high level, the downward trend was longer (until 2016).

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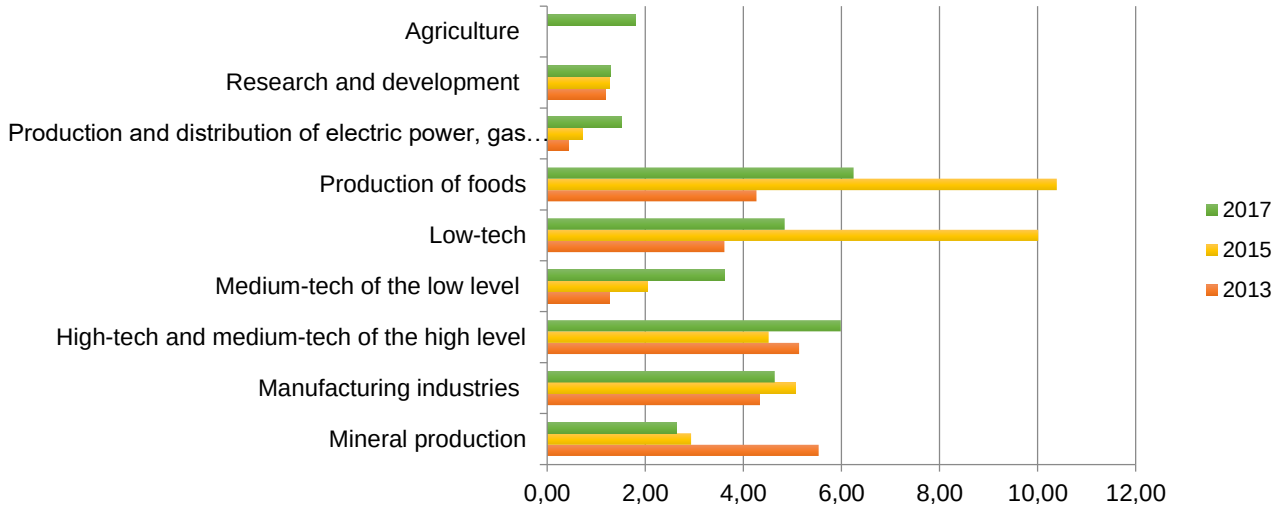

Fig. 1. Industry efficiency dynamics

Source: computed by the author from Rosstat (2019)

The increased efficiency of innovations in high-tech industries was driven by government support measures, including those aimed at promotion of the external demand for products of these industries (Government of the Russian Federation). Thus, in Russia, there is the program of subsidies for interest rates on loans that *Vnesheconombank* and *Roseximbank* provide to foreign customers purchasing Russian high-tech products. The Ministry of Economic Development provides non-financial support to exports of high-tech products in Russia via overseas trade missions of Russia. Such support includes informational, consulting, and organizational assistance. Besides, Russian producers might benefit from subsidies for registration of intellectual property in overseas markets and receive an indemnity for a part of the costs for product certification to enter the global market.

In 2015, the growth of innovations in the food industry was driven by the import substitution policy and the embargo on import of a range of food products introduced in 2014. The food industry in Russia is in a period of its active development. Over the recent 4 years, it has been a driver in the industrial production. Upon introduction of the food embargo in 2014, Russia restructured its imports and started the active development of its agriculture. In agriculture, over 6 years of the program, the output has increased by more than 50%. The largest TNCs (*PepsiCo, Danone, Coca-Cola Hellenic Bottling, Mars,* and *Mondelez International*), included in TOP-10 largest food producers and investors (localization of their production facilities and modernization of existing facilities) have had a significant impact on the growth of innovations in the industry (Kheyfets & Chernova, 2018).

There is a steady increase in efficiency of innovations without a sharp change in directions of dynamics observed in the research and development sector, and there is the same situation in agriculture. There was the highest rate of changes in efficiency in the period under study observed in production and distribution of electric power, gas, and water (Fig. 2), low-tech industries owing to food production, in medium-tech and high-tech industries.

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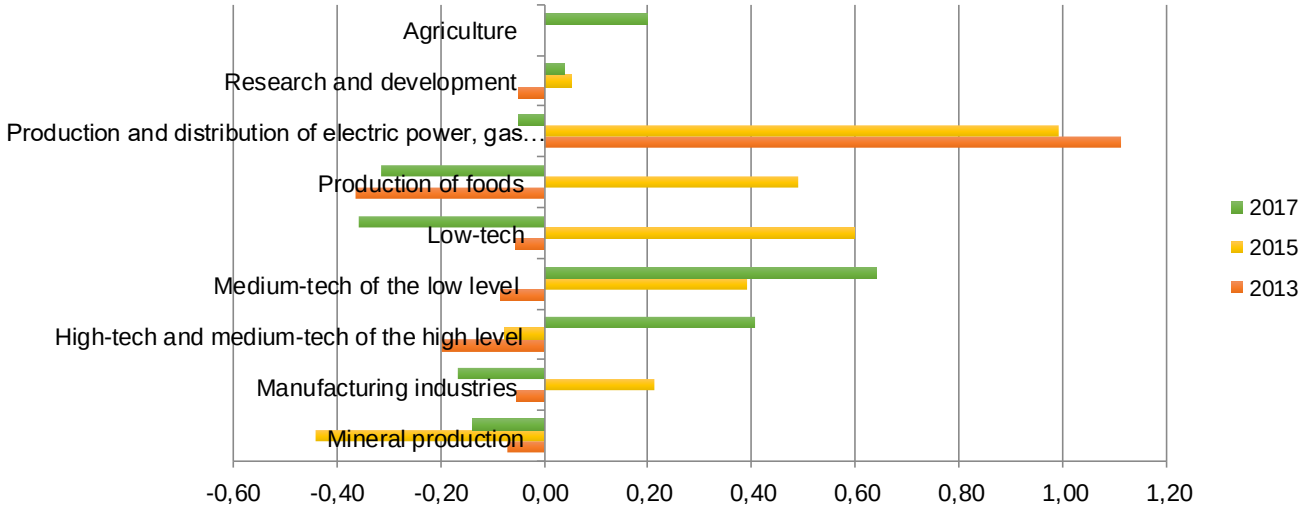

Fig. 2. Increment rate of innovations efficiency

Source: computed by the author from Rosstat (2019)

Dynamics of changes in efficiency of innovations in the sector of production and distribution of electric power, gas, and water is dependent on innovations at separate largest energy-generating enterprises in Russia. In general, a share of R&D costs at Russian energy-generating companies is insignificant. Thus, *Rosseti* annually spends about RUB1.0 billion for an entire R&D program, *RusHydro* - RUB0.4 billion, *Inter RAO* - RUB0.2 billion, and *Gazprom Energoholding* - RUB0.35 billion (Innovations in power sector: from formal R&D to future technology, 2019). R&D costs at the vertically integrated nuclear energy company (4.5% of revenue) (*Rosatom*), unlike other Russian energy-generating companies, are in absolute terms comparable to leaders in foreign energy-generating sector. French *EDF* spends 0.9% of its revenue for research, Spanish *Iberdrola* - 0.8%, Swedish *Vattenfall* - 0.5%, and Canadian *HydroQuebec* - 0.9%.

In many sectors of Russian economy, development and production of innovative products have become only possible because of high-tech imported components used in their structure. Complicated geopolitics and relations between Russia and Western countries have seriously hampered both production of innovative high-tech products, and their sales in export markets, even in terms of the import substitution policy. Moreover, the development of import-substituting facilities requires significant long-term investments. Russia has not only faced such weaknesses of innovation-driven manufacturing facilities in the power sector, but also in a number of other industries (Klochkov, 2017).

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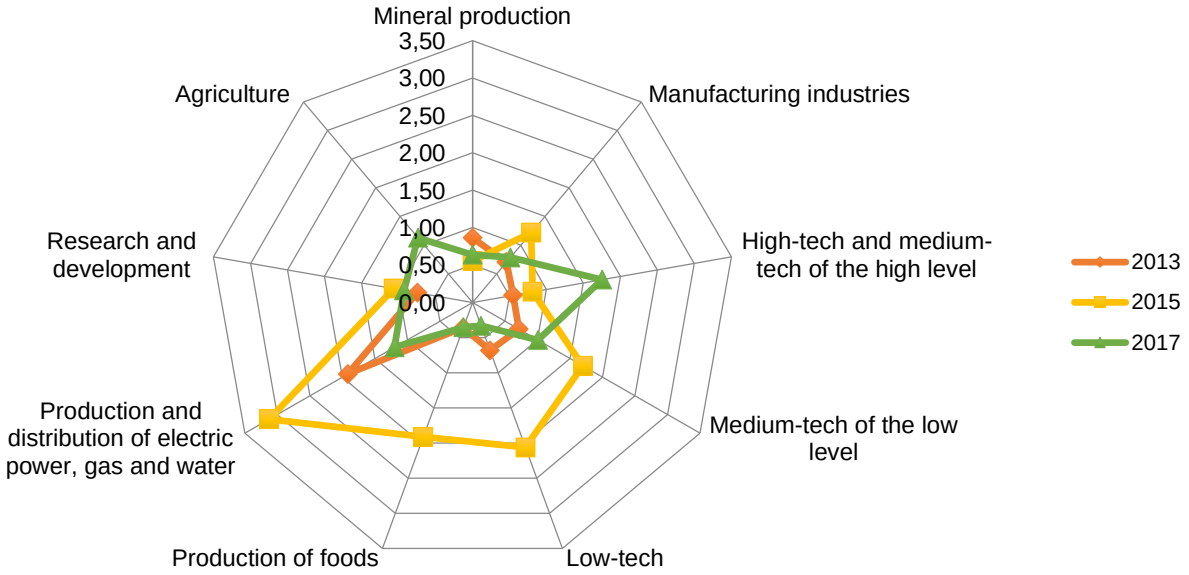

Fig. 3. Innovation intensity indicator

Source: computed by the author from Rosstat (2019)

The intensity of innovations, increased in 2017, in high and medium-tech industries of the medium-tech level (Fig. 3), is associated with an increased output of innovative products in the military-industrial complex (Barinova, Zemtsov and Lanshina, 2018). An indirect proof of this statement might be absolute leadership in proceeds from exported technologies in one of the high-tech industries, production of aircrafts, including spacecrafts (SRI HSE Institute of Statistics and Economy of Knowledge, 2016). In 2015, enterprises of this industry earned $60,137 million from exported technology, while their share of exported products was about 30%, while Russia mainly met its needs in civilian aircrafts and helicopters from imported goods (Bogachev, 2017).

5. Discussion

The completed research has confirmed conclusions by other researchers of unstable efficiency of innovations in Russian economy. Thus, Starodubova and Misbakhova (2016) show that in the petrochemical industry, in 2012-2014, a nature of innovations turned from optimal to unstable, whereas in the chemical industry and production of rubber and plastic products, innovations downgraded from unstable to the low level.

Motova (2016) comes to a similar conclusion based on data on innovations in industries of Russian economy and the cluster approach. The grouping attempt for main types of economic activities depending on intensity and efficiency of their innovations shows that it is impossible today to single out any cluster as a leader in innovations.
In Russian economy, a small number of innovatively active enterprises is typical (on the average for economy, it was 8.5% in 2017). It is several times smaller than in the developed countries (for example, in Germany, 50–

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60%), while a proportion of costs for technological innovations in the total volume of shipped products is at the level of leading countries (2.9% in 2014; 2.4% in 2017; in Germany, 2.12%; in Sweden, 2.98%). This implies that innovatively active enterprises invest in new technologies at the level of world's leaders and that innovation processes are largely concentrated at large-scale companies in contrast to many developed countries, where small and medium-sized enterprises are a driving force of innovations (Bogachev, 2017).

Despite the fact that in Russia, ICT introduction has got a status of a key development direction, at the current stage of formation of digital economy, there are fundamentally new engineering, organizational and managerial challenges. One of the problems in introduction of digital innovations in the real sector of economy is that there are almost no proven methods for digital transformation of companies in realias of digital economy. This is because the digitalization process started only a short time ago.

Main obstacles to digital transformation, according to businesspersons (Zemtsov, 2019), as a number of factors that one might divide into three groups (Fig. 4).

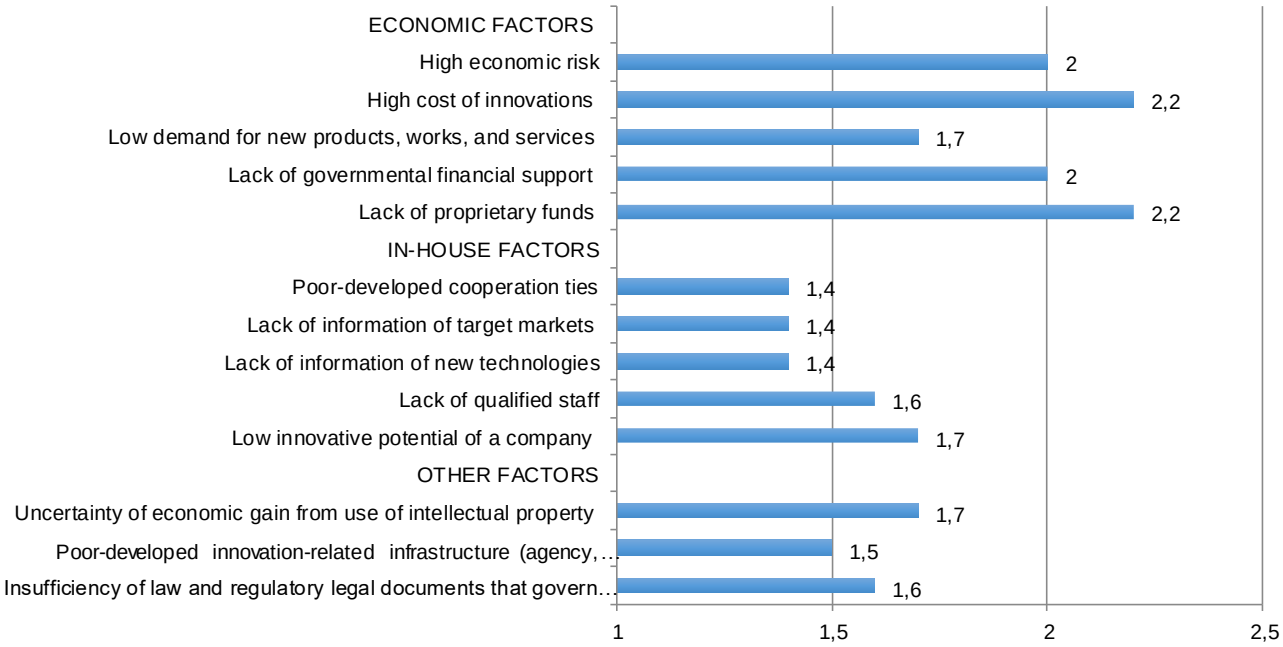

Fig. 4. Barriers to digital transformation of business

Source: compiled by the author from Zemtsov, 2019

Both national and international surveys of businesspersons show that prospects for an economic return on production digitalization are yet unclear. Introduction of such technologies is technically and organizationally challenging and capital-intensive, while a level of a possible additional income is poorly predictable (Plotnikov, 2018). The research of outcomes that introduced digital technologies had brought points out to unsuccessful implementation efforts. Sixteen percent respondents only say that at their companies, digital transformations have contributed to a long-term efficiency increase. Another 7 percent of respondents claim that they observed higher, but unsustainable efficiency. In conventional industries of economy, 7-11% of companies were only able to achieve success in their digital transformations (McKinsey, 2018.).

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Despite serious penetration of digital technologies in media and retail sectors (NRU "HSE", 2019), their penetration depth is on average below 40% (NRU "HSE", 2019a). The influence of digitalization on the revenue growth has also turned out to be questionable: the deeper penetration of digitalization into traditional industries makes constraints for the income and profit growth in lower-quartile companies and disproportionately influences performance indicators of upper-quartile companies (McKinsey, 2017).

The state support in individual industries is surely a significant factor of intensity in introduction of digital technologies. In 2017, compared to 2010, a share of funds from the federal budget in a structure of costs for technological innovations increased by 22.8% with a decline in foreign investment from 2.4% to 1% and a share of enterprises' proprietary funds by 17.3% (Statistics of Science and Education, 2018). There are significant differences between industries in a number of organizations benefitting from the government support. For instance, in the research and development sector, about 69% of organizations benefit from the government support. About 30% - in the high-tech industry, about 12% - in the manufacturing industry on average, and only 4% in low-tech industries (Zemtsov, 2019). Nevertheless, the food industry, in which only 1.7% of enterprises benefitted from the government support, shows high rates of innovations, while the research and development sector shows a stable but moderate increase in efficiency and intensity of innovations. Poor innovation activity in the manufacturing industry that produces a demand for innovations is a possible reason for this. Inefficiently spent financial resources is another reason.

Conclusion

One might apply the proposed approach to measurements of intensity of innovations for a comparative assessment of innovation processes in certain sectors of economy. It makes it possible to measure whether the growth is intense as applied to an output of innovative products. This serves as an indicator of introduction of new technologies and a transition to more high-tech conversion.

The completed study has showed that sectors of Russian economy typically show unsustainable dynamics of effort in the field of innovations. This is due to a number of factors, including the following: concentration of innovation efforts at large-scale Russian businesses and TNCs, high dependence between efficiency and intensity of innovations on external economic shocks (sanctions, embargo, intensified competition at overseas markets, etc.), significant impact on intensity of innovations from measures of government support, growth of innovation efforts in high-tech industries has been largely ensured by the military-industrial complex and promoted export of high-tech products with the insufficient national demand. An intensive nature of innovation efforts is clear in high-tech and medium-tech industries of the high-level, in production and distribution of electric power, gas and water, as well as agriculture.

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References

Abdrakhmanov, G.I. *et al.* (2019). What is Digital Economy? Trends, Competencies, Measurement: Report to XX Apr. International Scientific Conf. on Problems of Economic and Social Development (Moscow, April 9–12, 2019). Moscow: Publ. House of Higher School of Economics.

Barinova, V., Zemtsov, S. & Lanshina, T. (2018). *Development of High-Tech Sector in the Economy in Russia*. Retrieved from https://ssrn.com/abstract=3123060 or https://doi.org/10.2139/ssrn.3123060

Blinkin, M.Ya., *et al.* (2019). *Regulatory Development: New Challenges in Terms of Crucial Technological Changes: Report to XX Apr. International Scientific Conf. on Problems of Economic and Social Development* (Moscow, April 9–12, 2019). Moscow: Publ. House of the Higher School of Economics.

Bogachev, Yu.S. (2017). Producible structure as a factor of Russian economy sustainable development. *Strategicheskiy Menedzhment, 3*, 21–29.

Bondarenko, V.M. (2018). Structural modernization in terms of digital economy formation. *MIR (Modernizatsiya. Innovatsii. Razvitiye)*, 9(2) (34), 172-191. https://doi.org/10.18184/2079-4665.2018.9.2.172-191

Brynjolfsson, E., McAfee, A., Sorell, M. & Zhu, F. (2008). *Scale without mass: Business process replication and industry dynamics. Harvard Business School Technology & Operations Mgt. Unit Research Paper No. 07-016*. Retrieved from SSRN https://ssrn.com/abstract=980568 or https://doi.org/10.2139/ssrn.980568

Dahdueva, K.D. (2011). Problems and features of distinction between extensive and intensive development ways of an industrial enterprise. *Transport Business of Russia, 3*, 101-102.

European Conference on Innovation and Entrepreneurship, ECIE (pp. 394–401).

Eurostat. Statistics explained. Glossary: High-tech classification of manufacturing industries. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries

Galindo-Rueda, F. & Verger, F. (2016), "OECD Taxonomy of Economic Activities Based on R&D Intensity", OECD Science, Technology and Industry Working Papers, 2016/04. Paris: OECD Publishing. https://dx.doi.org/10.1787/5jlv73sqqp8r-en

Goraeva, T.Yu. & Shamina, L.K. (2014). Evaluation of development of high-tech types of economic activity. *Scientific and Technical Statements of the St. Petersburg State Polytechnic University. Economics, 6*(209), 113-123.

Government of the Russian Federation. *Non-commodity Export Support*. Retrieved from http://government.ru/rugovclassifier/599/main/

NRU "HSE". (2019). *Digital Activity of Retailers.* Moscow: NRU "HSE". Retrieved from https://issek.hse.ru/news/245193640.html

NRU "HSE". (2019a). *Digital Economy. A Brief Statistical Compilation*. Moscow: NRU "HSE".

Innovations in power sector: from formal R&D to future technology. (2019.). *Energetika i Promyshlennost' Rossii, 5*(361). Retrieved from https://www.eprussia.ru/epr/361/1509722.htm

Istomina, Ye.A. (2018). Methodology assessment of trends in the digital economy of industry. *CSU Bulletin, 12*(422), 108-116. https://doi.org/10.14529/em180312

Kheyfets, B.A., Chernova, V.Yu. (2018). Adaptation of market strategies of TNCs in Russia in the context of import substitution policy. *European Research Studies Journal, 21*(3), 192-205.

Klochkov, V.V. (2017). Analysis of the impact of technological changes in energy sector on sustainability of Russian economy. *National Interests: Priorities and Security, 13*(4) (349), 684-698.

Kuzmin, E.A. (2018). Data on empirically estimated corporate survival rate in Russia. *Data in Brief 16*. https://doi.org/10.1016/j.dib.2017.12.011

Kuzmin, E.A. & Guseva, V.E. (2016). Survival rate and lifecycle in terms of uncertainty: Review of companies from Russia and Eastern Europe. *Journal of Advanced Research in Law and Economics*. https://doi.org/10.14505/jarle.v7.7(21).23

Lavrovsky, B.L. (2018). Assessment of innovation intensity: the case of USA. *Ekonomika Regiona*, *14*(1), 281-291. https://doi.org/10.17059/2018-1-22

Litau, E. (2018a). Information flows management as a way to overcome "puberty challenges" of a small enterprise. In *ACM International Conference Proceeding Series* (pp. 34–38). https://doi.org/10.1145/3278252.3278259

Litau, E. (2018b). The information problem on the way to becoming a "Gazelle." In *Proceedings of the European Conference on Innovation and Entrepreneurship*, ECIE (Vol. 2018–September, pp. 394–401).

McKinsey. (2017). The Case for Digital Reinvention. Retrieved from https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-case-for-digital-reinvention

McKinsey. (2018). *Unlocking success in digital transformations*. Retrieved from https://www.mckinsey.com/business-functions/organization/our-insights/unlocking-success-in-digital-transformations

Motova, M.A. (2016). Determination of Russian innovative activity tendencies. *Statistics and Economics, 6,* 58-63. https://doi.org/10.21686/2500-3925-2016-6-58-63

Plotnikov, V.A. (2018). Digitalization of production: the theoretical essence and development prospects in the Russian economy. *Izvestiya Sankt-Peterburgskogo Gosudarstvennogo Ekonomicheskogo Universiteta, 4*(112), 16-24.

Romanova, O.A., Korovin, G.B. & Kuzmin, E.A. (2017). Analysis of the development prospects for the high-tech sector of the economy in the context of new industrialization. *Espacios*, *38*(59), 25.

Rosatom. *Science and Innovations. Innovative Activity*. Retrieved fromhttps://niirosatom.ru/o-kompanii/innovatsionnaya-deyatelnost/

Rosstat Order of January 14, 2014 No. 21 "On Approval of Methodology to Estimate Indicators "Share of High-tech and Knowledge-intensive Sectors in GDP" and "Share of High-tech and Knowledge-intensive Sectors in GRP." Retrieved from https://www.glavbukh.ru/npd/edoc/99_499076991

Rosstat Order of December 15, 2017 No. 832 (as amended on January 17, 2019) "On Approval of Methodology to Estimate Indicators "Share of High-tech and Knowledge-intensive Products in Gross Domestic Product" and "Share of high-tech and Knowledge-intensive Products in Gross Regional Product of a Subject of the Russian Federation." Retrieved from http://rulaws.ru/acts/Prikaz-Rosstata-ot-15.12.2017-N-832/

Rosstat. (2019). *Official Statistics. Science, Innovation and Information Society. Science and Innovations*. Retrieved from http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/science_and_innovations/science/#

Spitsin, V.V. (2010). Comparative analysis of innovation activity rates of Russia and foreign countries. *Tomsk State University Journal, 331,* 153–158.

SRI HSE Institute of Statistics and Economy of Knowledge. (2016). Foreign Trade of Russian Technology by Economic Activity. Retrieved from https://issek.hse.ru/data/2016/08/11/1118252870/NTI_N_11_10082016.pdf

Starodubova, A.A. & Misbakhova, Ch.A. (2016). Evaluation of innovation activity of certain types of economic activity. *Economic Analysis: Theory and Practice, 7*(454), 175-184.

Statistics of Science and Education. (2018) Issue 4. Innovative Activity in the Russian Federation. Info-stat. Mat. Moscow: FSBSI SRI FRCEC.

Tvaronavičienė, M. (2018). Towards internationally tuned approach towards critical infrastructure protection, *Journal of Security and Sustainability Issues, 8*(2), 143-150. https://doi.org/10.9770/jssi.2018.8.2(2)

Zemtsov, V.P. (Ed.). (2019). *National report "High-tech business in regions of Russia*," *2*. Moscow: RANKhiGS. AIRP.

Vlasov, A.I., Grigoriev, P.V, Krivoshein, A.I., Shakhnov, V.A., Filin, S. & Migalin, V.S. (2018). Smart management of technologies: Predictive maintenance of industrial equipment using wireless sensor networks. *Entrepreneurship and Sustainability Issues*, 6(2), 489–502. https://doi.org/10.9770/jesi.2018.6.2(2)

WEF. (2018). Digital Transformation Initiative. Unlocking $100 trillion for business and society from digital transformation. Executive summary, 12. Retrieved from http://reports.weforum.org/digital-transformation/wpcontent/blogs.dir/94/mp/files/pages/files/dti-executive-summary-20180510.

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MILITARY EXPERIENCED BOARD AND CORPORATE SOCIAL RESPONSIBILITY DISCLOSURE: AN EMPIRICAL EVIDENCE FROM INDONESIA*

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Abstract. This study examines the impact of military connection and politically connection on Corporate Social Responsibility Disclosure. Using 110 firm year observations of Indonesia listed firms, we predict that the presence of military or politically connection in firm's board will increase the Corporate Social Responsibility Disclosure level on its Sustainability Report. We found that military connected boards increase the Corporate Social Responsibility Disclosure while politically connection does not show any correlation. Our further analysis on specific type of each connection shows that military career position, army military origin, marine military origin, People's Consultative Assembly politically affiliation and House of Representation politically affiliation increase the level of Corporate Social Responsibility Disclosure level. Our result is robust due to various research model and Heckman's two stage regression.

Keywords: corporate social responsibility disclosure; military connection board; politically connected board

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1. Introduction

For a long time, the military has been viewed as developing value systems and beliefs in its veterans and their potentially great value in corporate business (Elder, 1986; Elder & Clipp, 1989; Groysberg, Hill, & Johnson, 2010). Through its influence, a military connection has been of considerable interest in business research topics. This paper adds to the literature by examining the military connection influence towards Corporate Social Responsibility Disclosure (CSRD).

Various studies have examined the influence of military connections towards corporate outcomes. Using 1,115 CEOs with military connection of US Firms, Benmelech and Frydman (2015) found that military-connected CEOs tend to have lower investment and RnD expenses and their firm is less likely to involve in fraud. They also found that military-connected CEOs performed better in industry distress times. Harymawan (2018) found that military-connected firms are statistically proven to have a lower interest rate of loan in Indonesian firms. In order to deal with endogeneity problems, Heckman's two-stage procedures are used in Harymawan's (2018) research. Military experienced CEOs also show has higher announcement-period of abnormal stock returns during corporate acquisition (Lin, et al., 2011). They also document poor corporate governance and acquisition outcomes' negative correlation is weakened by military-connected CEOs presence.

The military connection also shows some implications on corporate tax avoidance. Based on an assumption whereby CEOs who have greater respect for rules will avoid less tax, Law andMills (2013) found that those CEOs which represented as ex-military personnel will lead towards lower corporate tax avoidance, both in cash and GAAP effective tax rate. Further, they researched the detail on CEOs military experiences correlation with tax avoidance by moderating it according to his/her military service length, military academy attendance and having served during World War II, Korean War and Vietnam War (Law & Mills, 2014). In the latest literature, using a new econometric technique that disentangles manager effects from firm effects, Law and Mills (2017) found CEOs with military experiences maintain lower reserves for unrecognized tax benefits.

Prior literature provides lights on the debate regarding the benefits of hiring a corporate board that has a military-connection (Benmelech & Frydman, 2015; Duffy, 2006; Lin, et al., 2011; Mietzner & Misol, 2012; Rieffel & Pramodhawardani, 2007). However, to the as researchers' knowledge, there are no studies that specifically examine the military connection on Corporate Social Responsibly Disclosure (CSRD). Therefore, we focus on examining the correlation of military-connected firms on CSRD to provide additional knowledge of military-connected board benefits on the firm.

All samples consisted of Indonesian listed companies, a developing nation where its government has lack of transparency and is inefficient (Leuz, et al., 2003; Porta, et al., 1997), which provides additional opportunity to establish a strong mutual business relationship (Harymawan, 2018). It indicates that political connection is also an important variable to provide a robust result as we examine the correlation of military connection towards CSRD, as political connection shares some similar characteristics with a military connection in terms of the mutual business relationship in developing countries. Prior studies results show that political connection is shown to have a positive correlation with CSRD (Abd Rahman & Ku Ismail, 2016; Huang & Zhao, 2016). This correlation is based on political rent extraction (McChesney, 1987), where corporates with a politically-connected board are paid in the form of CSRD to meet government needs as they accept preferential policies from the government.

For our empirical tests, we employ univariate and multivariate analysis to test the hypotheses. Financial firms are excluded from the sample. Our final sample consists of 110 observations from the 2013-2017 period. We also provide additional analysis which is examining several military connections and political connection types to further highlight the relationship between military connection to CSRD. Lastly, we conduct Heckman's two-stage

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regression to deal with the endogeneity problem of military connection with its instrumental variable, which is a military base distance to a firm's headquarter office.

Our empirical results can be summarized as follows. First, we find that military connections are positively and significantly correlated with CSRD. This indicates that firms with rules concerning boards which represented a military connection provide more CSRD. This is because military personnel have a high concern about humanity as they are commonly dispatched to natural disaster sites. We also found that R2 coefficient increases if the military connection is included in the research model. Second, we find that there is no relationship between politically-connected firms and CSRD. One of the possible reasons is the tendency of politically-connected firms to protect the benefits acquired from the political connection (Chaney, et al., 2011), including CSRD.

Additional analysis of specific military and political connection types shows an interesting result. We document that higher military position, army military origin, and marine military origin have a positive significant correlation with CSRD, while, on the other hand, police origin has a negative correlation. This result derives from including Badan Intelijen Nasional (National Intelligence Agency) in police origin, wherein most of their operations are classified so their work nature is carried over into a firm's disclosure level, including CSRD. As for specific political connection types, we found that People's Consultative Assembly (PCA) and House of Representatives (HOR) affiliation has a positive correlation with CSRD. The underlying reason behind the result is that both PCA and HOR are Indonesian government bodies entitled to devise national regulations, including regulation related to CSR activities or its disclosure. Our Heckman's two-stage regression result provides additional empirically robust evidence of correlation of military connection and CSRD.

This study makes several contributions to the literature. First, the result of this study shows the advantages enjoyed by military-connected firms in developing countries (Harymawan, 2018; Mietzner & Misol, 2012). To our knowledge, this study is the first empirical study to provide the effect of military experience director with a focus on CSRD in Indonesia. Second, this study complements the prior studies in the CSRD (e.g. Cheng, et al., 2014; El Ghoul, et al., 2011; Saeidi, et al., 2015) by providing evidence on the factors that might affect the level of CSRD in developing countries.

The rest of the paper is organized as follows. Section II provides a background for the study and this is followed by the hypotheses development section. Section III describes our sample and research model. Section IV reports our main empirical results. Section V concludes.

2. Theory and Hypothesis Development

2.1. Board Connections Charateristic in Indonesia

Developing countries (Malaysia, South Africa, Pakistan, Libya, Turkey, etc.), including Indonesia, have provided certain advantages towards firms which select a board that has certain connections (Abd Rahman & Ku Ismail, 2016; Fung, et al., 2015; Funnel, 2005; Habib, et al., 2017; Harymawan, 2018; Shah, 2014. This results from Indonesia not having strict and detailed regulation on specific board connection characteristics. As long as it does not violate the laws and provides certain benefits, firms will keep considering hiring board(s) that have military and/or political connections.

Military forces (Tentara Nasional Indonesia, TNI) were a dominant player in the economy during the strongman era of President Soeharto, a former general, gaining favored access to contracts and controlling nationalized companies. This phenomenon can be proven to be true as there has always been at least one presidential candidate that has applied in a presidential election since 2004. Thus, we can conclude that Indonesia is a country with an enormous influence of the military over the political decision-making process (Harymawan, 2018).

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After the fall of Soeharto, Indonesia has demonstrated significant progress in the context of the first generation of military reforms, which is closely related with institutional changes in the government security sector (Mietzner, 2009). According to Cottey, et al. (2001), "the first generation" is the important stage where disassembling old power structures and, at the same time, also the definition of what the final goal of the democratic transition should be. Large extraction has been happening in the military from formal politics and business and has developed a new system in legislation in order to overview and control the military. But Indonesia is still trapped and cannot fully enter the second generation of military reform, which is completing the framework that was developed in the first: it provides the democratic substance to the structures established by laws and political decisions (Mietzner, 2009).

In mid-2005, Indonesia established the TNI Business Transformation Management Agency with a primary objective to clean up military business from the Suharto legacy (Vestergaard, 2006), and we documented several examples of businesses that had a major military player involved. A large number of military were involved in business in Indonesia due to the Indonesia military forces raising money outside the government budget by spreading the business network. Such business is not directly controlled by the military's central command, but they have been allowed to spread so as to overcome the budget constraints (Human Rights Watch, 2006).

Undoubtedly, the military has a major influence on Indonesian business, as both parties enjoy mutual benefits. It provides unique institutional settings to examine the relationship between military connection and business activities in Indonesia. Especially the corporate action that relates to certain military traits such as empathy to social situations.

In accordance with a military connection, the political connection is also widely spread in Indonesian business. Indonesia's political party funding system = is basically from three sources - internal (member contributions), state-grant, and external (Mietzner, 2015). The central level of a political party needs approximately 50 billion Rupiahs ($26 million) funding annually while both member donations and state donations each only 0.6 billion Rupiahs (Faisal, et al., 2018). Thus, it means politics is highly involved in the business as its main source of funds comes from the private sector. On the other side, a business can provide easiness related to specific regulations as its token of gratitude.

2.2. Hypothesis development

Military personnel have the impression that they are powerful and disciplined figure that can hopefully give influence in the form of positive corporate actions. Military-connected CEOs can influence executives' decisions, corporate policy, corporate outcomes and tend not to be involved in fraud (Benmelech & Frydman, 2015). According to Lin, Ma, Officer, and Zou (2011), a military-connected CEO can influence the firm value by lowering the agency cost in the context of acquisition and earn a good acquisition.

Another trait that becomes a main advantages of using ex-military personnel is leadership. Multi-national companies such as Wal-Mart and General Electric are craving leadership talent. Those companies have for some years been recruiting junior military officers that served in Iraq and Afghanistan (O'Keefe, 2010). A major player in business needs a CEO that has already proven they can manage a fiercely competitive business environment and, among all candidates' background, military experiences may well suit best for this requirement (Duffy, 2006). Firms should be interested in appointing directors who possess not only superior decision-making skills under pressure, but who also may be inclined to behave more ethically to prevent future breaches of stakeholder trust (Simpson & Sariol, 2018). Somehow military personnel have been viewed as a great leader as they have already experienced hard times and rallied the morale of their comrades. Military officers are used to managing the psychology of his/her subordinates to accomplish their duty effectively and efficiently.

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Military personnel have been acknowledged as having a strong relationship with leadership. General Eric K. Shinseki, Chief of Staff of The Army states: "We are about leadership; it is our stock in trade, and it is what makes us different". The military is often stereotyped as a monolithic society and that everything inside the military is homogeneous. Military forces tend to have a diverse collection, such as organizations, roles, cultures, and people (Wong, et al., 2003). For example, in Indonesia, the military is divided into three professions: Angkatan Darat (Army), Angkatan Laut (Marine), and Angkatan Udara (Airforce). Each profession has own uniqueness and culture, and, as a result, its own unique aspect of leadership.

Military personnel are also known as parties used to being the first backup to help causalities when there is a disaster. As military personnel are often to be dispatched as soon as possible to a disaster location, it's possible to foster military personnel sensitivity towards society conditions through various humanity actions which are closely related to Corporate Social Responsibility (CSR).

Oh, Bae, & Kim (2017) claim that sinful firms which including firearms and military industries tend to neutralize their negative image by intensifying advertising of their CSR activities. According to them, sinful firms tend to increase advertising efforts when they engage in CSR comparing to non-sinful firms. It can be hint for management of military industries who also mostly military veterans are used to view CSR as important variable to maintain firms' image.

The combined traits that we previously mentioned will ensure military personnel will encourage the other management to follow his/her opinion, resulting in companies having tendencies to pay more attention to their CSR activities. Those CSR activities will be documented in the company's Sustainability Report (SR) and, as a result, military-connected companies indicate their CSE as one of the important corporate actions that needs to be done. For all those reasons we devise the first hypothesis as follow:

H1: Military-Connected Board is positively related to CSRD

Political connections allow a company to be able to increase economic benefits and some companies have a more pointed political background to the Board of Directors due to the experience, insight, and ability with regard to the government (Agrawal and Knoeber, 2001). A Board of Directors which has experience with regards to the government, considers that CSR can improve the performance of the company. According to Huang and Zhao (2016), political connections can be a positive correlation against the CSR performance of private companies listed on the Shanghai Stock Exchange for the period 2008-2014. In addition, political connections are considered capable of giving advantages to improve the company's performance (Bencheikh, et al., 2017) and also increase the value of the company (Faccio, 2006). Therefore, the second hypothesis in this research is as follows:

H2: Politically-connected Board is positively related to CSRD

3. Sample and Research Model

3.1. Sample and Data

We initially obtained from the Sustainability Disclosure Database a sample of 244 firm-year observations from Indonesia over the period 2013-2017 from the GRI database. To test our hypotheses, we exclude (1) firms that not listed on the Indonesia Stock Exchange; (2) firms that do not issue a sustainability report; (3) firms included in financial industries (SIC 6). The final sample consists of 110 firm-year observation with 33 firms.

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Our final data are described in Table I. Table I is comprised of firms' distribution by its connection. As shown in Panel A, we found that 28 firm-year observations (22 percent) from all our sample are of a military-connected firm. It means that, in only less than one-fourth of companies, one or more company board(s) has military experience. This result is consistent with other military connection research (Benmelech & Frydman, 2015; Harymawan, 2018; Law & Mills, 2017; Lin, et al., 2011) that military personnel and activities tend to be less certain in listed companies. This phenomenon is highlighted as a result of military-connected companies tending to be less transparent in order to avoid public monitoring (Misol, 2006). We also documented that, among all industry types based on US SIC only wholesale and trade industry (SIC 5), military-connected companies firm-year observations are higher than companies than do not have any military connection.

Table 1. Sample Distribution based on Industry Classification

Panel A. Military Connection Sample Distribution (MCON)						
Industry (SIC)	MCON		NON-MCON		Total	
	N	%	N	%	N	%
Agriculture, Forestry, and Fishing (0)	0	0	10	100	10	100
Mining and Construction (1)	12	34	23	66	35	100
Manufacturing (2)	6	40	9	60	15	100
Manufacturing (3)	2	12	15	88	17	100
Transportation, Communications, Electric, Gas and Sanitary service (4)	1	5	19	95	20	100
Wholesale and Retail Trade (5)	7	78	2	22	9	100
Services (8)	0	0	4	100	4	100
Total	28	25	82	76	110	100
Panel B. Political Connection Distribution Sample (PCON)						
Industry (SIC)	PCON		NON-PCON		Total	
	N	%	N	%	N	%
Agriculture, Forestry, and Fishing (0)	7	70	3	30	10	100
Mining and Construction (1)	27	63	8	37	35	100
Manufacturing (2)	10	80	5	20	15	100
Manufacturing (3)	9	41	8	59	17	100
Transportation, Communications, Electric, Gas and Sanitary service (4)	16	75	4	25	20	100
Wholesale and Retail Trade (5)	9	100	0	0	9	100
Services (8)	2	50	2	50	4	100
Total	73	66	37	34	110	100

Source: Computed by authors

Unlike military connection, politically-connected companies have likely shown their presence in listed companies, as shown in panel B. According to our sample, there is 66 percent among all our sample classified as a politically-connected sample (see Table 2). It is also a fact that politically-connected boards are favored in

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Indonesia according to mounting research of Indonesia's political connections (Fisman, 2001; Habib, et al., 2017; Leux & Oberholzer-Gee, 2006)..

Table 2. Sample Distribution based on Military and Political Connection Types

Panel A. Military Connection Sample Distribution Types (MCON)						
MCON Type	Selected type MCON		Other types MCON		Total	
	N	%	N	%	N	%
Military position						
Top officers (position)	20	71	8	29	28	100
Middle officers (position)	4	4	27	96	28	100
Low officers and others (position)	7	25	21	75	28	100
Military origin						
Army (Origin)	18	64	10	36	28	100
Marine (Origin)	7	25	21	75	28	100
Airforce (Origin)	0	0	28	100	28	100
Police (Origin)	7	25	21	75	28	100
Panel B. Political Connection Distribution Sample Types (PCON)						
PCON Type	Selected type PCON		Other type PCON		Total	
	N	%	N	%	N	%
Political board						
Board of Commissioner	78	96	2	4	80	100
Board of Director	24	29	56	71	80	100
Political affiliation						
People's Consultative Assembly	17	21	63	79	80	100
House of Representatives	15	19	65	81	80	100
Ministry	71	89	9	11	80	100
Organization	47	59	33	41	80	100
State-owned	47	59	33	41	80	100
Political party	0	0	80	100	80	100

Source: Computed by authors

Interested in more types of military and political connection, we also classified our sample into more specific connections. Table 2 represents our sample with a more specific connection. We classify military connection into two classifications: based on military position and military origin (Panel A). There are three kinds of military positions which are a top officer (general), middle officer (major and colonel), and others. It shows that most of the military-connected boards have a high tier position with a former past military career. We also divide the military based on their origin. We add police origin as police (including Indonesian State Intelligence Agency personnel) as they mostly have the same traits as military personnel.

As for the political connection, we also classify this into two: based on its board position and its political affiliation (Panel B). It shows that politically-connected listed companies are dominated by a Politically Exposed Person (PEP) who has a connection to certain ministry in Indonesia (89 percent).

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Descriptive statistics are provided in Table 3, as shown below. We construct three panels of descriptive statistics with panel A using all sample (N=110), while panel B only focuses on the difference between military-connected (N=28) and non-military-connected sample (N=82) also panel C focuses on both politically connected (N=73) and non-politically-connected sample (N=37). Both panel B and C show that CSRD in military and political connections have greater average value compared to non-military and non-politically-connected sample, respectively.

Table 3. Statistic Descriptive

Panel A. All Sample (N=110)				
Variable	Mean	Median	Minimum	Maximum
CSRD	0.401	0.357	0.099	0.956
MCON	0.218	0.000	0.000	1.000
PCON	0.664	1.000	0.000	1.000
ROE	0.155	0.108	-0.406	1.358
LEV	0.507	0.491	0.136	1.193
FSIZE	30.701	30.771	28.453	32.744
BSIZE	12.418	12.000	7.000	20.000
INDCOM	0.342	0.333	0.000	0.750
AUDCOM	3.300	3.000	0.000	6.000
BIG4	0.800	1.000	0.000	1.000

Panel B. Military Connection (N=28) and Non-Military Connection Sample (N=82)								
Variable	Mean		Median		Minimum		Maximum	
	MCON	Non-MCON	MCON	Non-MCON	MCON	Non-MCON	MCON	Non-MCON
CSRD	0.499	0.368	0.467	0.352	0.099	0.099	0.956	0.813
MCON_POS	2.464	0.000	3.000	0.000	1.000	0.000	3.000	0.000
MCON_ARMY	0.643	0.000	1.000	0.000	0.000	0.000	1.000	0.000
MCON_MARINE	0.250	0.000	0.000	0.000	0.000	0.000	1.000	0.000
MCON_POLICE	0.250	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PCON	0.929	0.659	1.000	1.000	0.000	0.000	1.000	1.000
ROE	0.134	0.162	0.129	0.092	-0.079	-0.406	0.330	1.358
LEV	0.511	0.506	0.502	0.491	0.281	0.136	0.744	1.193
FSIZE	30.924	30.627	30.843	30.771	29.859	28.453	32.045	32.744
BSIZE	12.571	12.366	12.000	12.000	9.000	7.000	20.000	17.000
INDCOM	0.348	0.339	0.333	0.333	0.000	0.000	0.500	0.750
AUDCOM	3.393	3.268	3.000	3.000	0.000	0.000	6.000	6.000
BIG4	0.607	0.866	1.000	1.000	0.000	0.000	1.000	1.000
Panel C. Political Connection (N=73) and Non-Political Connection Sample (N=37)								

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Variable	Mean		Median		Minimum		Maximum	
	PCON	Non-PCON	PCON	Non-PCON	PCON	Non-PCON	PCON	Non-PCON
CSRD	0.420	0.353	0.368	0.341	0.099	0.110	0.956	0.813
MCON	0.325	0.067	0.000	0.000	0.000	0.000	1.000	1.000
PCON_BOC	0.975	0.000	1.000	0.000	0.000	0.000	1.000	0.000
PCON_BOD	0.300	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PCON_PCA	0.212	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PCON_HOR	0.188	0.000	0.000	0.000	0.000	0.000	1.000	0.000
PCON_MINISTRY	0.887	0.000	1.000	0.000	0.000	0.000	1.000	0.000
PCON_ORG	0.588	0.000	1.000	0.000	0.000	0.000	1.000	0.000
PCON_STATE	0.588	0.000	1.000	0.000	0.000	0.000	1.000	0.000
ROE	0.137	0.202	0.107	0.144	-0.406	-0.069	1.358	1.358
LEV	0.499	0.528	0.490	0.503	0.176	0.136	0.802	1.193
FSIZE	30.843	30.327	30.838	30.447	28.799	28.453	32.744	32.487
BSIZE	12.613	11.900	12.000	12.000	7.000	7.000	20.000	16.000
INDCOM	0.336	0.357	0.333	0.333	0.000	0.000	0.750	0.600
AUDCOM	3.413	3.000	3.000	3.000	2.000	0.000	6.000	5.000
BIG4	0.825	0.733	1.000	1.000	0.000	0.000	1.000	1.000

Source: Computed by authors

3.2. Corporate Social Responsibility Disclosure (CSRD) Model

To test the effect of military and political connections on the Corporate Social Responsibility Disclosure (CSRD), we estimate the following model:

$$CSRD_{i,t} = \beta_0 + \beta_1 MCON_{i,t} + \beta_2 PCON_{i,t} + \beta_3 ROE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 BSIZE_{i,t} + \beta_7 INDCOM_{i,t} + \beta_8 AUDCOM_{i,t} + \beta_9 BIG4_{i,t} + \beta_{10} YEAR_{i,t} + \beta_{11} INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (1)$$

We employed those control variables based on prior literature (Chen, et al., 2019; Martínez-Ferrero, et al., 2016; McGuinness, et al., 2017; Ramón-Llorensa, et al., 2018; Wang, et al., 2018 we add return on equity, leverage, firm's size, board of commissioners and directors, independent commissioners, audit committee, and firm's public accounting firm.

Table 4. Variable Definition

Variable	Definition	Data source
Dependent variable		
CSRD	Percentage of disclosed criteria in Sustainability Report (SR)	SR
Test variable		
MCON	1 for a firm with one or more commissioners and/or directors who held military positions before sitting on the board and otherwise 0	ICMD
MCON_POS	Military last position, 3 for top officers; 2 for middle officers; 1 for lower officers and others and otherwise 0	ICMD

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MCON_ARMY	1 for military origins is army (*Angkatan Darat*) and otherwise 0	ICMD
MCON_MARINE	1 for military origins is marine (*Angkatan Laut*) and otherwise 0	ICMD
MCON_AIRFORCE	1 for military origins is airforce (*Angkatan Udara*) and otherwise 0	ICMD
MCON_POLICE	1 for military origins is police and/or Indonesian State Intelligence Agency (*Badan Intelijen Nasional*) and otherwise 0	ICMD
PCON	1 for a firm with one or more commissioners and/or directors who held political positions current/before sitting on the board and otherwise 0	ICMD
PCON_BOC	1 for Political Exposed Person (PEP) is sitting on the Board of Commissioner and otherwise 0	ICMD
PCON_BOD	1 for Political Exposed Person (PEP) is sitting on the Board of Director and otherwise 0	ICMD
PCON_PAC	1 for Political Exposed Person (PEP) affiliation from People's Consultative Assembly and otherwise 0	ICMD
PCON_HOR	1 for Political Exposed Person (PEP) affiliation from House of Representatives and otherwise 0	ICMD
PCON_MINISTRY	1 for Political Exposed Person (PEP) affiliation from Indonesia's Ministry and otherwise 0	ICMD
PCON_ORG	1 for Political Exposed Person (PEP) affiliation from important organizations and otherwise 0	ICMD
PCON_STATE	1 for Political Exposed Person (PEP) affiliation from state-owned companies or *Pemerintah Republik Indonesia* (Indonesia's government) ownership minimum 10% of total firm ownership and otherwise 0	ICMD
PCON_PARTY	1 for Political Exposed Person (PEP) affiliation from a political party and otherwise 0	ICMD
Control variable		
ROE	Net income after preferred divided by average total assets for the year	OSIRIS
LEV	Total liabilities scaled by total assets	OSIRIS
FSIZE	Natural logarithm of total assets	OSIRIS
BSIZE	The total person who sits on the boards	ICMD
INDCOM	The total person who positioned as an independent commissioner	AR
AUDCOM	The total person who sits on the audit committee	AR
BIG4	1 for firm's Public Accountant Firm (PAF) is either Deloitte, Ernst & Young (EY), KPMG, and PricewaterhouseCoopers (PWC) and otherwise 0	OSIRIS
MILLS	The inverse Mills ratio	
Selection model variable		
MDIST	Natural logarithm of the distance between the location of an Indonesian Military base and the firm's headquarters	Mapdevelopers.com

Source: Constructed by authors

We provide operational variable measurement in Table 4. The data source of this research sample comes from Sustainability Report (SR), Indonesia Capital Market Directory (ICMD), OSIRIS database, Annual Report (AR) and map developer website. As mentioned before, we divide the military and political connection into a specific connection. We also derive other OLS to test the specific effect of each military connection and political connection on the CSRD. The estimated model for the specific connection types is:

$$\boldsymbol{CSRD}_{i,t} = \beta_0 + \beta_1 \boldsymbol{X1}_{i,t} + \beta_2 \boldsymbol{ROE}_{i,t} + \beta_3 \boldsymbol{LEV}_{i,t} + \beta_4 \boldsymbol{FSIZE}_{i,t} + \beta_5 \boldsymbol{BSIZE}_{i,t} + \beta_6 \boldsymbol{INDCOM}_{i,t} + \beta_7 \boldsymbol{AUDCOM}_{i,t} + \beta_8 \boldsymbol{BIG4}_{i,t} + \beta_9 \boldsymbol{YEAR}_{i,t} + \beta_{10} \boldsymbol{INDUSTRY}_{i,t} + \varepsilon_{i,t} \quad \textbf{(2)}$$

$$\boldsymbol{CSRD}_{i,t} = \beta_0 + \beta_1 \boldsymbol{X2}_{i,t} + \beta_2 \boldsymbol{ROE}_{i,t} + \beta_3 \boldsymbol{LEV}_{i,t} + \beta_4 \boldsymbol{FSIZE}_{i,t} + \beta_5 \boldsymbol{BSIZE}_{i,t} + \beta_6 \boldsymbol{INDCOM}_{i,t} + \beta_7 \boldsymbol{AUDCOM}_{i,t} + \beta_8 \boldsymbol{BIG4}_{i,t} + \beta_9 \boldsymbol{YEAR}_{i,t} + \beta_{10} \boldsymbol{INDUSTRY}_{i,t} + \varepsilon_{i,t} \quad \textbf{(3)}$$

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X1 = Specific military connection types. It can be either military position or military origins (army, marine, police)
X2 = Specific political connection types. It can be either political board (board of commissioner, the board of director) or political affiliation (people's consultative assembly, house of representatives, organization, ministry, state, political party).

Table 5. Pearson Correlation Matrix (N=110)

	CSRD	MCON	PCON	ROE	LEV	FSIZE	BSIZE	INDCOM	AUDCOM	BIG4
CSRD	1.000									
MCON	0.366***	1.000								
	(0.000)									
PCON	0.018	0.376***	1.000							
	(0.856)	(0.000)								
ROE	-0.103	-0.039	-0.043	1.000						
	(0.286)	(0.683)	(0.653)							
LEV	-0.137	-0.071	0.105	0.082	1.000					
	(0.153)	(0.459)	(0.275)	(0.393)						
FSIZE	0.239**	0.161*	0.228**	-0.192**	-0.046	1.000				
	(0.012)	(0.094)	(0.017)	(0.045)	(0.631)					
BSIZE	0.310***	0.062	0.059	0.039	-0.107	0.365***	1.000			
	(0.001)	(0.521)	(0.543)	(0.683)	(0.264)	(0.000)				
INDCOM	0.209**	0.044	-0.074	-0.391***	-0.136	0.133	-0.100	1.000		
	(0.029)	(0.648)	(0.443)	(0.000)	(0.156)	(0.165)	(0.298)			
AUDCOM	0.022	-0.095	0.181*	-0.045	-0.035	0.296***	0.045	-0.041	1.000	
	(0.820)	(0.321)	(0.059)	(0.644)	(0.718)	(0.002)	(0.640)	(0.671)		
BIG4	-0.069	-0.121	-0.067	0.141	-0.489***	0.099	-0.062	-0.094	0.038	1.000
	(0.474)	(0.208)	(0.485)	(0.143)	(0.000)	(0.304)	(0.520)	(0.328)	(0.697)	

Source: Computed by authors

Table 5 provides a correlation matrix for all variables used in the main analyses. The relationship between MCON and CSRD is positive. We also found military connections are positively associated with the relationship between CSR and PCON variable is positive but not significant. This gives the picture that a company that has a member of the Board of Commissioners and/or Directors of connected politics will have no result on CSRD of the company. We also employ univariate test of our research variable. Table 6 displays the results of the t-test, which explains that the average value of the CSR performance of companies that have military connections is higher compared to companies that are not connected to the military, while the company connected politics has an average value of a company's CSRD higher than a company that without political connections.

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Table 6. Independent T-test Result

Panel A. Military Connection *Independent t-test* (MCON)				
VARIABLE	MEAN		Coef	t-value
	MCON (N=24)	NON-MCON (N=86)		
CSRD	0.543	0.362	0.180***	4.093***
ROE	0.132	0.161	-0.028	-0.410
LEV	0.482	0.514	-0.033	-0.744
FSIZE	30.985	30.622	0.363*	1.690*
BSIZE	12.667	12.349	0.318	0.643
INDCOM	0.352	0.339	0.013	0.458
AUDCOM	3.125	3.349	-0.224	-0.997
BIG4	0.708	0.826	-0.117	-1.267
Panel B. Political Connection *Independent t-test* (PCON)				
VARIABLE	MEAN		Coef	t-value
	PCON (N=73)	NON-PCON (N=37)		
CSRD	0.404	0.396	0.008	0.182
ROE	0.145	0.173	-0.027	-0.451
LEV	0.522	0.479	0.042	1.098
FSIZE	30.853	30.402	0.451**	2.435**
BSIZE	12.507	12.243	0.264	0.610
INDCOM	0.335	0.355	-0.019	-0.770
AUDCOM	3.425	3.054	0.371*	1.911*
BIG4	0.781	0.838	-0.057	-0.701
t statistics in parentheses * t > 1,660 **t > 1,984 ***t > 2,626, in level of 10%, 5% and 1%.				

Source: Computed by authors

4. Empirical Results

In this section, we reported the empirical result of research analysis on the relationship of military and political connection to Corporate Social Responsibility Disclosure (CSRD). In the first section, we provide the result of the OLS regression of the main research model. Next, we present the OLS regression for each relation of specific military and political connection to CSRD. Last but not least, we described the result of Heckman's two-stage regression model to deal with the military connection endogeneity problem.

4.1. Main Analysis

We provide our main analysis in Table 7. First, we decide to make the OLS regression model without any test variables (column 1) to find the adjusted R^2 value before considering any test variables in the research model. In the second and third column, we provide each test variables (e.g. military connection and political connection), respectively. We found that military connection (MCON) has a positive coefficient (0.111) and is statistically significant at the 5 percent level (t=2.09). We also documented that the adjusted R^2 value is increasing compared to first research model (column 1). Based on the third column, political connection (PCON) has no significant

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correlation (t=0.94) on CSRD. We also employ both test variables into one research model and find MCON still has positive coefficient (0.108) and significant correlation (t=1.99), which implies that the result is robust in any model, with or without PCON in the research model. We also conduct the regression model where we make the interaction between MCON and PCON, but it shows no significant result.

Table 7. Military Connection, Political Connection and CSRD OLS

	(1)	(2)	(3)	(4)
	CSRD	CSRD	CSRD	CSRD
MCON		0.111**		0.108**
		(2.09)		(1.99)
PCON			0.033	0.016
			(0.94)	(0.46)
ROE	-0.118	-0.110	-0.107	-0.105
	(-1.44)	(-1.34)	(-1.27)	(-1.25)
LEV	-0.042	-0.023	-0.049	-0.027
	(-0.44)	(-0.23)	(-0.52)	(-0.27)
FSIZE	0.050**	0.039*	0.048**	0.039*
	(2.53)	(1.96)	(2.34)	(1.89)
BSIZE	0.020**	0.020**	0.019**	0.019**
	(2.42)	(2.29)	(2.28)	(2.20)
INDCOM	0.347**	0.353**	0.366**	0.362**
	(2.43)	(2.43)	(2.56)	(2.47)
AUDCOM	-0.003	-0.007	-0.006	-0.008
	(-0.26)	(-0.51)	(-0.47)	(-0.60)
BIG4	0.070	0.116*	0.065	0.112*
	(1.27)	(1.90)	(1.16)	(1.81)
Industry Fixed Effect	Included	Included	Included	Included
Year Fixed Effect	Included	Included	Included	Included
_cons	-1.361**	-1.077*	-1.294**	-1.053*
	(-2.42)	(-1.89)	(-2.19)	(-1.80)
Adjusted r2	0.361	0.391	0.358	0.385
F	14.283	13.617	11.928	12.341
N	110	110	110	110
t statistics in parentheses * t > 1,660 **t > 1,984 ***t > 2,626, in level 10%, 5% and 1%.				

Source: Computed by authors

As MCON showing shows a positive correlation with CSRD, we infer that our first hypothesis is accepted while our second test variable, PCON, shows a different result. We expect that that result comes from the information disclosure of politically-connected firms as being lower compared to other firms. One of the reasons is that tendencies are politically-connected firms protect the benefits acquired from the political connection (Chaney, et al., 2011). Another possible reason is that the politically-connected board(s) will prioritize personal matter over firm interest (Bencheikh & Taktak, 2017).

4.2. Specific Military Connection Types Analysis

In this section, we provide deeper analysis which specifies military connection types. As shown in Table 8, we employ four additional specific military connection types (e.g. position, army, marine, and police). We omit the air force military origins as our sample did not consist of any air force military connection origins. The first column shows that the higher position of military career has a positive coefficient (0.041) and significant correlation (t=2.16). Consistent with the military position, army and marine military connection are shown to be positive and statistically significant at level 1% and 5%, respectively. The different result comes from a military

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connection that comes from police origin, it shows negative (-0.228) correlation at a 1% level of significance (t=-3.24) with CSRD. These results also imply that the army and marine military origin correlations towards CSRD are stronger than police correlation as the aggregate military connection shows a positive correlation (Table 7).

Table 8. Military Connection, Political Connection and CSRD OLS

	(1)	(2)	(3)	(4)
	CSRD	CSRD	CSRD	CSRD
MCON_POS	0.041**			
	(2.16)			
MCON_ARMY		0.153***		
		(2.65)		
MCON_MARINE			0.200**	
			(2.16)	
MCON_POLICE				-0.228***
				(-3.24)
ROE	-0.097	-0.091	-0.121	-0.091
	(-1.21)	(-1.18)	(-1.44)	(-1.19)
LEV	-0.008	-0.002	-0.054	-0.041
	(-0.08)	(-0.02)	(-0.57)	(-0.45)
FSIZE	0.036*	0.034*	0.053**	0.057***
	(1.77)	(1.80)	(2.62)	(3.15)
BSIZE	0.021**	0.022**	0.022**	0.023***
	(2.45)	(2.56)	(2.49)	(2.88)
INDCOM	0.364**	0.339**	0.345**	0.311**
	(2.54)	(2.35)	(2.33)	(2.23)
AUDCOM	-0.002	0.001	-0.003	0.007
	(-0.18)	(0.09)	(-0.23)	(0.53)
BIG4	0.102*	0.093*	0.060	0.000
	(1.84)	(1.81)	(1.12)	(0.00)
Industry Fixed Effect	Included	Included	Included	Included
Year Fixed Effect	Included	Included	Included	Included
_cons	-0.986*	-0.973*	-1.456**	-1.616***
	(-1.74)	(-1.82)	(-2.54)	(-3.08)
Adjusted r2	0.395	0.422	0.409	0.406
F	13.922	14.440	14.524	16.187
N	110	110	110	110
t statistics in parentheses * t > 1,660 **t > 1,984 ***t > 2,626, in level 10%, 5% and 1%.				

Source: Computed by authors

The military position is closely related to the number of responsibilities. A higher tier officer has more mounting responsibilities than their junior subordinates. This provides a basic understanding of the positive correlation between military position and CSRD. As for military origin, army and marine have been trained to possess Esprit De Corps and sensitivity to others, which means they feel responsible to help others in the form of corporate CSR. The negative correlation of police origins may come from the fact that police origin is dominated by the Indonesia State Intelligence Agency (Badan Intelijen Nasional), in which, although their organizational ultimate goal is to help others, most of their operations are conducted in secretly. They are not used to sharing information as most of the organizational activities are classified.

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4.3. Specific Political Connection Types Analysis

As we conducted with a military connection, we are also interested to further analyze the correlation of specific political connection types towards CSRD. Table 9 provides the result of specific political connection types. Among all specific political connection types only People's Consultative Assembly (MCON_PCA) and House of Representative (MCON_HOR) affiliation shows significant correlation towards CSRD. The coefficient MCON_PCA is 0.093 and MCON_HOR is 0.119 exposed 10% (t=1.67) and 1% (t=2.67) level of significance.

Table 9. Specific Political Connection OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CSRD	CSRD	CSRD	CSRD	CSRD	CSRD	CSRD
PCON_BOC	0.048						
	(1.34)						
PCON_BOD		-0.077					
		(-1.38)					
PCON_PCA			0.093*				
			(1.67)				
PCON_HOR				0.119***			
				(2.67)			
PCON_MINISTRY					0.017		
					(0.45)		
PCON_ORG						0.016	
						(0.48)	
PCON_STATE							-0.000
							(-0.01)
ROE	-0.106	-0.141*	-0.106	-0.077	-0.115	-0.120	-0.118
	(-1.27)	(-1.80)	(-1.25)	(-0.99)	(-1.40)	(-1.43)	(-1.43)
LEV	-0.040	-0.000	-0.049	-0.040	-0.052	-0.031	-0.042
	(-0.43)	(-0.00)	(-0.52)	(-0.43)	(-0.53)	(-0.33)	(-0.44)
FSIZE	0.048**	0.050**	0.043**	0.045**	0.047**	0.049**	0.050**
	(2.40)	(2.57)	(2.26)	(2.36)	(2.09)	(2.48)	(2.42)
BSIZE	0.018**	0.020**	0.020**	0.026***	0.020**	0.020**	0.020**
	(2.13)	(2.51)	(2.27)	(3.01)	(2.35)	(2.36)	(2.40)
INDCOM	0.365**	0.331**	0.327**	0.399***	0.349**	0.344**	0.347**
	(2.59)	(2.38)	(2.16)	(2.83)	(2.44)	(2.40)	(2.39)
AUDCOM	-0.009	-0.003	-0.010	-0.007	-0.006	-0.005	-0.003
	(-0.66)	(-0.22)	(-0.70)	(-0.48)	(-0.41)	(-0.36)	(-0.24)
BIG4	0.069	0.065	0.060	0.060	0.067	0.069	0.070
	(1.22)	(1.26)	(1.15)	(1.15)	(1.22)	(1.26)	(1.26)
Industry Fixed Effect	Included	Included	Included	Included	Included	Included	Included
Year Fixed Effect	Included	Included	Included	Included	Included	Included	Included
cons	-1.302**	-1.358**	-1.111**	-1.332**	-1.262*	-1.343**	-1.363**
	(-2.24)	(-2.43)	(-2.02)	(-2.42)	(-1.90)	(-2.36)	(-2.28)
Adjusted r2	0.364	0.374	0.379	0.395	0.355	0.355	0.354
F	11.407	16.708	14.218	15.979	12.791	12.928	13.368
N	110	110	110	110	110	110	110

t statistics in parentheses
* t > 1,660 **t > 1,984 ***t > 2,626, in level 10%, 5% and 1%.

Source: Computed by authors

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The underlying reason behind those results is that both PCA and HOR are Indonesia's government bodies entitled to devise national regulations, including regulation related to CSR activities or its disclosure. It means PCA and HOR politically connected firms have a longer time to adjust to new regulations as, mostly, the firm will be informed long before those regulations are published.

4.4. Self-selection Bias

Self-selection bias is a bias that is introduced into a research project when participants choose whether or not to participate in the project, and the group that chooses to participate is not equivalent (in terms of the research criteria) to the group that opts out. The problem of selection bias in economic and social statistics and arises when a rule other than simple random sampling is used to sample the underlying population that is the object of interest (Heckman, 2010). According to Harymawan (2018), there are possibilities where unobserved military connection traits are the antecedents rather than military connections. In order to deal with this issue, we employ Heckman's two-stage model following Kim and Zhang (2016).

In the first stage of regression, we used military base distance (MDIST) as our selection model variable to ensure that the CSRD is correlated with the military connection, not the military base distance. Hereby, we estimate the following first stage regression model is as follows:

$$MCON_{i,t} = \beta_0 + \beta_1 MDIST_{i,t} + \beta_2 ROE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 FSIZE_{i,t} + \beta_5 BSIZE_{i,t} + \beta_6 INDCOM_{i,t} + \beta_7 AUDCOM_{i,t} + \beta_8 BIG4_{i,t} + \beta_9 YEAR_{i,t} + \beta_{10} INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (4)$$

The exclusion variable in this research is MDIST, which is closely related to MCON. We believe that MDIST has no direct relationship to CSRD other than indirect impact through MCON. According to prior research (Harymawan, 2018; Kim & Zhang, 2016), closer distance from firm headquarter office and military base will result in more chance of having military-connected board(s), at the same time that distance will have no explanation towards CSRD.

In order to examine the correlation between military connection and CSRD, we estimated the following second-level regression equation:

$$CSRD_{i,t} = \beta_0 + \beta_1 MCON_{i,t} + \beta_2 PCON_{i,t} + \beta_3 ROE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 BSIZE_{i,t} + \beta_7 INDCOM_{i,t} + \beta_8 AUDCOM_{i,t} + \beta_9 BIG4_{i,t} + \beta_{10} INVMILLS_{i,t} + \beta_{11} YEAR_{i,t} + \beta_1 INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (5)$$

Using the estimation result of the first-level regression equation, we constructed Mills ratios and included these ratios in the second-stage regression (INVMILLS). The β_1 is expected to have positive and significant to indicate that military-connected board(s) will be favorable in terms of improving the CSRD.

Table 10. Heckman Two-Stage Regression

	1st Stage Regression	2st Stage Regression	
	MCON	**CSRD**	**CSRD**
MCON		0.101*	0.099*
		(1.69)	(1.66)
PCON			0.014
			(0.38)
MDIST	5.317***		
	(4.25)		

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ROE	0.072	-0.111	-0.106
	(0.17)	(-1.33)	(-1.26)
LEV	-0.359	-0.012	-0.017
	(-0.46)	(-0.11)	(-0.16)
FSIZE	0.613***	0.032	0.033
	(2.61)	(1.10)	(1.11)
BSIZE	-0.091	0.022**	0.021*
	(-1.22)	(2.00)	(1.84)
INDCOM	-1.008	0.371**	0.376**
	(-0.90)	(2.48)	(2.50)
AUDCOM	-0.166	-0.007	-0.008
	(-1.16)	(-0.49)	(-0.57)
BIG4	-1.551***	0.130*	0.125
	(-3.45)	(1.75)	(1.61)
INVMILLS		-0.016	-0.013
		(-0.35)	(-0.28)
Industry Fixed Effect	Included	Included	Included
Year Fixed Effect	Included	Included	Included
_cons	-28.303***	-0.876	-0.890
	(-3.50)	(-1.07)	(-1.08)
Pseudo r2	0.301		
Adjusted r2		0.385	0.379
F		13.020	11.897
N	110	110	110

t statistics in parentheses
* t > 1,660 **t > 1,984 ***t > 2,626, in level 10%, 5% and 1%.

Source: Computed by authors

Table 10 presents the result of Heckman's two-stage regression. The first column shows the result of the first-stage regression model. It shows that military distance has positive (5.317) and significant correlation at 1% (t=4.25). The second and third column in Table 10 is the result of second-stage regression where the dependent is CSRD not MCON as in the first-stage regression. In the third column, we add PCON in the research model to provide a more robust result. This second-stage regression result implies that the correlation MCON toward CSRD is robust whether in ordinary OLS model (Table 8) or Heckman's two-stage regression model (Table 10).

Conclusions

Based on the test results of the analysis performed over the variables examined, the conclusions that can be drawn from this study are as follows. Military connection has positive and significant effect against CSR, meaning the company having a member of the Board of Commissioners or Directors of the experienced military can generate CSR better than companies that do not have a Member the Board of Commissioners or Directors who are military experienced. This is because members of the military are known as the soul of good leadership, discipline, and also the ability of good organizing (Harymawan, 2018) ,as well as having influence in management decision-making (Benmelech & Frydman, 2015), considered to be able to improve performance as well as the CSRD of company. However, political connections have a negative and not significant relationship towards CSR. This is due to the possibility of an indication that members of the Board of Commissioners or Directors of connected politics would sacrifice the interests of the company for the sake of objective political connections for personal gain (Bencheikh & Taktak, 2017), so that attention to managing your company's information disclosure quality will be low in order to protect the benefits obtained on gains from political connections (Chaney, et al., 2011). For further studies we recommend that to add more proxy of CSR such as

KLD (Simpson & Sariol, 2018), CSR advertising expense (Oh, et al., 2017) or other CSRD criteria to provide more robust result of military connection and CSR correlation.

References

Abd Rahman, I. & Ku Ismail, K. N. I., 2016. The effects of political connection on corporate social responsibility disclosure – evidence from listed companies in Malaysia. *International Journal of Business and Management Invention* 5(2): 16-21. Retrieved from https://www.researchgate.net/publication/303402635_The_effects_of_political_connection_on_corporate_social_responsibility_disclosure_-_evidence_from_listed_companies_in_Malaysia

Bencheikh, F. & Taktak, N. B., 2017. The effect of political connections on the firm performance in a newly democratised country. *Mediterranean Journal of Social Sciences* 8(4): 40-46. https://doi.org/10.1515/mjss-2017-0004

Benmelech, E. & Frydman, C., 2015. Military CEOs. *Journal of Financial Economics* 117(1): 43-59. https://doi.org/10.3386/w19782

Bertrand, M., Kramarz, F., Schoar, A. & Thesmar, D., 2018. The cost of political connections. *Review of Finance*, pp. 849-876. https://doi.org/10.1093/rof/rfy008

Chaney, P. K., Faccio, M. & Parsley, D., 2011. The quality of accounting information in politically connected firms. *Journal of Accounting and Economics* 51(1-2): 58-76. http://dx.doi.org/10.2139/ssrn.966379

Chen, W., Zhou, G. & Zhu, X., 2019. CEO tenure and corporate social responsibility performance. *Journal of Business Research* 95: 292-302. https://doi.org/10.1016/j.jbusres.2018.08.018

Duffy, T., 2006. *Military experience and CEOs: Is There a Link?*, s.l.: Kom/Ferry International Report. Retrieved form https://www.kornferry.com/institute/190-military-experience-and-ceos-is-there-a-link

Elder, G., 1986. Military times and turning points in men's lives. *Developmental Psychology* 22(2): 233–245. https://doi.org/10.1037/0012-1649.22.2.233

Elder, G. & Clipp, E., 1989. Combat experience and emotional health: Impairment and resilience in later life. *Journal of Personality* 57(2): 311–341. https://doi.org/10.1111/j.1467-6494.1989.tb00485.x

Faisal, Barid, B. & Mulyanto, D., 2018. Pendanaan Partai Politik di Indonesia: Mencari Pola Pendanaan Ideal untuk Mencegah Korupsi. *Integritas* 4(1): 265-287. https://doi.org/10.32697/integritas.v4i1.248

Fernandez-Feijoo, B., Romero, S. & Ruiz, S., 2014. Commitment to Corporate social responsibility measured through global reporting initiative reporting: factors affecting the behavior of companies. *Journal of Cleaner Production* 81. 244-254. https://doi.org/10.1016/j.jclepro.2014.06.034

Fisman, R., 2001. Estimating the Value of Political Connections. *American Economic Review* 91(4): 1095-1102. https://doi.org/10.1257/aer.91.4.1095

Fung, S., Gul, F. & Radhakrishnan, S., 2015. Corporate political connections and the 2008 Malaysian election. *Accounting, Organization, and Society* 43(3): 67-86. https://doi.org/10.1016/j.aos.2015.04.001

Funnel, W., 2005. Accounting on the frontline: cost accounting, military efficiency, and the South African war. *Accounting and Business Research*, 35(4): 307-326. https://doi.org/10.1080/00014788.2005.9729997

Göktepe, G. & Satyanath, S., 2013. The economic value of military connections in Turkey. *Public Choice*: 531-552. https://doi.org/10.1007/s11127-011-9886-8

Groysberg, B., Hill, A. & Johnson, T., 2010. Which of these people is your future CEO? The different ways military experience prepares managers for leadership. *Harvard Business Review*: 81-85. Retrieved from https://hbr.org/2010/11/which-of-these-people-is-your-future-ceo-the-different-ways-military-experience-prepares-managers-for-leadership

Habib, A., Muhammadi, A. & Jiang, H., 2017. Political connections, related party transactions, and auditor choice: Evidence from Indonesia. *Contemporary Accounting Research*: 1-19. https://doi.org/10.1016/j.jcae.2017.01.004

Harymawan, I., 2018. Why do firms appoint former military personnel as directors? Evidence of loan interest rate in militarily connected firms in Indonesia. *Asian Review of Accounting* 26(1): 2-18. https://doi.org/10.1108/ARA-07-2016-0086

Heckman, J., 2010. Selection Bias and Self-Selection. In: *Microeconometrics.* London: Palgrave Macmillan: 242-266. https://doi.org/10.1057/9780230280816_29

Hermawan, A., Aisyah, I. S., Gunardi, A. & Putri, W. Y., 2018. Going Green: Determinants of Carbon Emission Disclosure in Manufacturing Companies in Indonesia. *International Journal of Energy Economics and Policy*, 8(1), pp. 55-61. Retrieved from https://www.econjournals.com/index.php/ijeep/article/view/6009

Huang, H. & Zhao, Z., 2016. The influence of political connection on corporate social responsibility——evidence from Listed private companies in China. *International Journal of Corporate Social Responsibility*: 9-28. https://doi.org/10.1186/s40991-016-0007-3

Human Rights Watch, 2006. *Indonesia: Military Business Threatens Human Rights*, s.l.: Scoop Media Limited. Retrieved from https://www.hrw.org/news/2006/06/21/indonesia-military-business-threatens-human-rights

Kaoe, E. H., Yeh, C.-C., Wang, L.-H. & Fung, H.-G., 2018. The relationship between CSR and performance: Evidence in China. *Pacific-Basin Finance Journal* 51: 155-170. https://doi.org/10.1016/j.pacfin.2018.04.006

Kim, C. & Zhang, L., 2016. Corporate Political Connections and Tax Aggressiveness. *Contemporary Accounting Research* 33(1): 78-114. https://doi.org/10.1111/1911-3846.12150

Law, K. K. F. & Mills, L. F., 2017. Military experience and corporate tax avoidance. *Review of Accounting Studies* 22(1): 141-184. https://doi.org/10.1007/s11142-016-9373-z

Law, K. K. & Mills, L. F., 2015. Managerial Characteristics and Corporate Taxes. *Colloquium On Tax Policy And Public Finance Spring 2015*. Retrieved from https://www.law.nyu.edu/sites/default/files/upload_documents/Lillian%20Mills.pdf

Law, K. & Mills, L. F., 2013. Following the Rules? Corporate Tax Reporting by CEOs with Military Experience. *SSRN Electronic Journal* https://doi.org/10.2139/ssrn.2302329

Oberholzer-Gee, F. & Leux, C., 2006. Political relationships, global financing, and corporate transparency: Evidence from Indonesia. *Journal of Financial Economics* 81(2): 411-439. http://dx.doi.org/10.2139/ssrn.720741

Leuz, C., Nanda, D. & Wysocki, P. D., 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, 69(3), pp. 505-527. http://dx.doi.org/10.1016/S0304-405X(03)00121-1

Lin, C., Ma, Y., Officer, M. S. & Zou, H., 2011. CEOs' military experience, agency costs and acquisition decisions. *SSRN Electronic Journal*. http://dx.doi.org/10.2139/ssrn.1932623

Lin, K., Mills, L., Zhang, F. & Li, Y., 2018. Do Political Connections Weaken Tax Enforcement Effectiveness?. *Contemporary Accounting Research*: 1941-1972. https://doi.org/10.1111/1911-3846.12360

Martínez-Ferrero, J., Rodríguez-Ariza, L. & García-Sánchez, I.-M., 2016. Corporate social responsibility as an entrenchment strategy, with a focus on the implications of family ownership. *Journal of Cleaner Production* 135: 760-770. https://doi.org/10.1016/j.jclepro.2016.06.133

McChesney, F. S., 1987. Rent extraction and rent creation in the economic. *The Journal of Legal Studies*: 179-196. https://doi.org/10.1086/467825

McGuinness, P. B., Vieito, J. P. & Wang, M., 2017. The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *Journal of Corporate Finance* 42: 75-99. https://doi.org/10.1016/j.jcorpfin.2016.11.001

Mietzner, M., 2009. *Military Politics, Islam, and the State in Indonesia: from Turbulent Transition to Democratic Consolidation.* Singapore: Institute of Southeast Asian Studies https://doi.org/10.1355/9789812308450

Mietzner, M., 2015. Dysfunction by Design: Political Finance and Corruption in Indonesia. *Critical Asian* Studies: 587-610. https://doi.org/10.1080/14672715.2015.1079991

Mietzner, M. & Misol, L., 2012. Military businesses in post-Suharto Indonesia: decline, reform, and persistence. In: *The Politics of Military Reform.* Berlin and Heidelberg: Springer, pp. 101-120. https://doi.org/10.1007/978-3-642-29624-6_5

Misol, L., 2006. *Too high a price: the human rights cost of the Indonesian military's economic activities,* s.l.: Human Right Watch. Retrieved from https://www.hrw.org/report/2006/06/20/too-high-price/human-rights-cost-indonesian-militarys-economic-activities

Oh, H., Bae, J. & Kim, S. J., 2017. Can Sinful Firms Benefit from Advertising Their CSR Efforts? Adverse Effect of Advertising Sinful Firms' CSR Engagements on Firm Performance. *Journal of Business Ethics* 134(4): 643-663. https://doi.org/10.1007/s10551-016-3072-3

O'Keefe, B., 2010. Battle-tested: how a decade of war has created a new generation of elite business leaders. *Human Resource Management International Digest* 18(6). https://doi.org/10.1108/hrmid.2010.04418fad.006

Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R. W., 1997. Legal determinants of external finance. *The Journal of Finance* 52(3): 1131-1150. https://doi.org/10.3386/w5879

Ramón-Llorensa, M. C., García-Mecaa, E. & Pucheta-Martínez, M. C., 2018. The role of human and social board capital in driving CSR reporting. *Long Range Planning.* https://doi.org/10.1016/j.lrp.2018.08.001

Rieffel, A. & Pramodhawardani, J., 2007. *Out of Business and on Budget: The Challenge of Military Financing in Indonesia.* MA and Washington, DC: Brookings Institution Press, 356p.

Shah, A., 2014. Constraining consolidation: military politics and democracy in Pakistan (2007-2013). *Democratization* 21(6): 1007-1033. https://doi.org/10.1080/13510347.2013.781586

Simpson, J. & Sariol, A. M., 2018. Squared Away: Veterans on the Board of Directors. *Journal of Business Ethics,* pp. 1-11. https://doi.org/10.1007/s10551-018-3907-1

Vestergaard, T., 2006. *Government Sets Up Agency to Manage Military-Run Indonesian Businesses,* s.l.: Global Insight Daily Analysis.

Wang, Z., Reimsbach, D. & Braam, G., 2018. Political embeddedness and the diffusion of corporate social responsibility practices in China: A trade-off between financial and CSR performance?. *Journal of Cleaner Production* 198: 1185-1197. https://doi.org/10.1016/j.jclepro.2018.07.116

Wong, L., Bliese, P. & McGurk, D., 2003. Military leadership: a context-specific review. *Leadership Quarterly* 14: 657-692. https://doi.org/10.1016/j.leaqua.2003.08.001

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LNG MARITIME ENERGY CONTRACTING MODEL*

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Abstract. To meet the global 2020 low sulphur demand and beyond, the supply of low sulphur fuel must increase and expand. So far, the world bunker market is split between the different compliance solutions increasing demand for sulphur compliant fuel. The work examines the implementation of an innovative business model initially designed to meet energy needs. The developed model facilitated a sustainable LNG supply/distribution process economically and was further tested with a real-life case example that shows the cost structure for the proposed model. Both quantitative and qualitative data approaches were used to collect data. The illustrated modified features of the LNG maritime energy contract model accentuate an analytical and unconventional strategy embedded in experimentation.

Keywords: SECA regulations, Baltic Sea region, clean shipping, sustainability, LNG, global suphur cap

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1 Introduction

The sulphur emissions regulations have two different sections namely the sulphur emission areas (SECA) and the global sulphur standard. The SECA concept was created in 2005, and it forces shipowners only to use fuel with low sulphur content when they travel within these controlled areas. Presently, there is a restriction of 0.1% that applies in the BSR, the North Sea, and the English Channel, America /Canadian coastlines (IMO 2009, 2015). Already in the SECA, sulphur emissions from ships are not allowed to be above 0.1%, a law enacted from January 2015 (Lindstad & Eskeland, 2016). Other SECA related regulations are the Chinese regulation for coastal waters (published in December 2015 and came into effect in 2016) and the EU directive 2005/33/EC (Olaniyi, 2017). The global sulphur standard on another hand applies to areas that are not SECA although it was first targeted at ships coming into or leaving MARPOL-treat countries (Seo et al., 2016). Now it applies to all non-SECA area and with this standard, the MARPOL Annex VI necessitates all vessels outside SECA all over the world to use fuel with a sulphur content not more than 3.5% w/w of sulphur and 0.5% w/w from 1 January 2020 (CE Delft, 2016). At the initial time of the regulation, there was much pressure to push it further to 2025 on the basis that it could save the maritime industry between $30 billion and $50 billion annually (Platts, 2016) but this has been refuted to be unlikely to happen.

Since shipowners are considered as the heart of the maritime industry as they influence the demand and supply for services within the industry, it is within the right to say that their SECA compliance activities are strategic not only to their overall business but to the whole industry (Fiksdahl & Wamstad, 2016). Already, the strict SECA law has compelled them to make a serious decision regarding their choice of fuel for bunkering (Seo et al., 2016) and the incoming of the 2020 global sulphur cap has certainly escalated the urgency of solutions for compliance and clean shipping globally. Shipowners have become frantic about their options and worried about the economic optimisation of their decisions (Abadie, Goicoechea & Galarraga, 2017). Fact is that the sulphur regulations have come to stay and they might as well begin to think about the sustainability of their compliance choices.

The SECA regulation compliance approach can be summed up in three different frameworks: economic, operational and strategic (Morris, Schindehutte & Allen, 2005). For the shipowners, it is not possible to ignore the economic significance of the compliance activities as they mean significant financial commitment directly connected to the operational aspect since fuel cost and consumption are an integral part of shipping and makeup to about 50 - 60% of voyage operational cost (Stopford, 2009; Bialystocki & Konovessis, 2016). Other factors that affect the operational costs of shipping are sailing patterns of vessels like the routes, change of routes, vessel speed and type of vessels (Gu & Wallace, 2017) but they can only be considered as supplementary when compared to fuel influence. That was why at the onset of SECA some ships changed their vessels to bigger ones; some increased the number of their routes while some reduced the numbers of their routes to reduce costs.

The choice of sulphur regulation compliance determines the strategic stance of individual ship owner (Sys, Vanelslander, Adriaenssens & Van Rillaer, 2016) and there are different alternatives considered as being economically feasible to meet the SECA regulations (Seo et al., 2016). Currently, shipowners are exploring the economically viable options for the SECA and the global sulphur law - especially post 2020. In the BSR, the popular choices for ship compliance are switching from heavy fuel oil (HFO) to low sulphur fuel i.e. marine gas oil (MGO), maritime diesel oil (MDO) or the ultra-low sulphur fuel (ULSFO), the use of scrubber plus HFO an abatement technology and the use of alternative fuel like the liquefied natural gas (LNG). All approaches have their pros and cons, and different shipowners have built their compliance strategies around one or more of them with most of their decisions weighed between their capital expenditures and their operational expenditure (Gu & Wallace, 2017). Hoping to solve this critical challenge, many studies have proposed different approaches to help the choice of the

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compliance approaches ranging from multi-criteria approach (Ren and Lützen, 2015), stochastic programming (Schinas & Stefanakos, 2012), cost-benefit analysis (Jiang et al., 2014), costs function of emission abatement alternatives (Lindstad et al., 2015) and value at risk (VaR) analysis (Atari & Prause 2017). All studies point to the urgency for more sustainable solutions for regulatory compliance.

Since bunkering plays an essential role for each voyage, the most solution would revolve or evolve around bunker fuel demand and supply. No wonder, the world bunker market is split between the different compliance solutions (Semolinos, Olsen & Giacosa, 2013). Already, IMO appointed CE Delft (2016) to assess the availability of fuel oil with the stipulated requirement of a 2020 focus. Their results showed a balanced supply and demand for fuel around the world. However, regional surpluses and shortages are projected to occur from 2020. It is evident that the demand trend in the maritime industry of today is erratic, i.e. the volume of production of fuel is growing, and so is the demand. There appears to be a shift in demand especially from developing economies; the middle class is increasing across the globe, so preferences are changing (Kadavias & Kostas 2015). The collapse of the oil price in 2014 introduced a downturn to the oil and gas industry where most fuel companies have had to face high-pressure from their customers (Prause et al., 2019). Many predictions became useless affecting the supply chain, although most companies have taken on the road of reducing their CAPEX and OPEX (i.e. stopping substantial investment and reducing overheads) there is no telling on where this would lead anyone in the future (Rack, 2017).

For this reason, to generate a successful and sustainable match between escalating demands and supply there should be a successful match of the combination between technology, innovation and strategic business model (van der Vliet, 2017). The same applies to develop value for the ever-increasing volume of customers. Thus, the pressure to innovate and evolve is unavoidable. The current market predicament where bunker suppliers and shipowners are "waiting to see" what would happen or who would make the first move needs to be broken to forge current stalemate ahead (Wang & Notteboom, 2015). The intensive investment involved these activities should be thorough and well organised to reduce the risk, and the system must take into consideration the ever-changing environmental regulations landscape (Castillo & Dorao, 2012).

Matching novel technologies to market needs through compelling commercial offerings can help an industry pursue productive and cost-effective approaches to supply such as collaborative and risk resilient supply chains. As it is, the highest share of ships that spend 100% of their time in a SECA plies the Baltic Sea. Already, the fuel demand/supply in the BSR totals up to about 25% of the total SECA demand/supply (Danish Maritime Authority, 2012). There is much attention on the region to improve and upgrade bunkering infrastructure in the ports for SECA complaint fuel that has exposed logistics and distribution needs to match fuel demand across the globe and most especially the SECA area such as the BSR (Semolinos et al., 2013).

Against this background, the core objective of this study is to propose a shift in the LNG distribution business model to improve LNG distribution capacity and to transform its markets for efficiency. The study uses the concept of Maritime Energy Contract (MEC) business model (Olaniyi, Gerber, Prause, 2018a); (Olaniyi, Atari, Prause, 2018b); (Olaniyi, Prause, Bakkar, 2019) to offer the delivery of emission reduction to increase the LNG business performance and exploit the business opportunities for the LNG distribution in the BSR. Few records exist on LNG use as opportunity and value proposition leading towards emerging value chains (Gerlitz et. al., 2017; Paulauskas et al., 2017). As a result, the present paper addresses this research gap of marginalised focus on business modelling and value generation from LNG business.

Knowing that supply chain optimisation is a proven way to ensure the interconnectedness, a significant hurdle for LNG bunkering (Kadavias & Kostas 2015); the MEC model is used as a stimulus for value creation and the realisation of competitive advantage in the maritime industry for a new entrepreneurial process. The research raises the question: How can the MEC model transform the LNG distribution process to create value for the maritime

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industry? What is the value delivery and linkages? How to control the transactions between the entities involved and what incentives are there for the parties?

The study is presented in the following manner: the next section is the literature review, and it gives an overview of the maritime fuel demand and supply landscape given the SECA compliance. It also introduces the change of business model as a way to achieve optimisation of the LNG value chain for the maritime industry. The third section presents the methodology used for the work. The fourth section discusses the result while the last part concludes.

2 Literature review

Compliance methods in the Baltic Sea Region (BSR)

Realistically, without considering economic aspects, switching to the use of MGO/MDO remains the most comfortable pathways for shipowners, because they are readily available worldwide and in the most ports (Semolinos et al., 2013) although, the cost MGO/MDO is considerably higher than other types of fuel (Lindstad & Eskeland, 2016). Another type of low sulphur fuel that is used as an alternative to the HFO is the ultra-low sulphur fuel (ULSFO), a by-product of hydrodesulphurisation (HDS). HDS is a multi-catalytic chemical process that removes sulphur compounds from refined fuel (Lin, Hong, Jianhua & Jinjuan, 2010). Since 2014, the HDS process has gained increased momentum and has steadily found its way to the bunkering world with increasing acceptance by shipowners (Lee, Ryu & Min, 2003). While the effect of long usage is only speculated and not mainly known or proven, most shipowners are drawn to it because it is cheaper than the MGO and close to the cost of the HFO (Semolinos et al., 2013).

Unfortunately, on the upstream refining process, its growth might likely be undermined by the cost of refinery upgrade required for fuel producers who already are plagued with low fuel costs. While shipowners have shown their desire for this probable solution, the refiner is unwilling to commit to it because of the high capital investment required for production plant upgrade (Livanos, Theotokatos & Pagonis, 2014).

Even though maritime transport is far less regulated than land-bound transport, there are still specific apprehensions commonly voiced with the costs that arise from regulatory compliance because they could run into millions of euros (Gollop & Roberts, 1983). This is also true for shipping regulations whose implication on the activities of the maritime sector stakeholders are directly or indirectly linked to the economic decision that will ensue in their efforts to comply. Most authorities start regulatory projects believing that the investments are economically justified, i.e. the benefits to society supersedes the costs (Renda, 2017).

The use of scrubbers looked very promising for the sulphur emissions prevention solution, but there are still many debates on its ecological usefulness and investment worthiness. Although, the scrubber technology has been one that has amassed so many high stakes enough for solution-driven contemplation (Semolinos et al., 2013). The scrubber technology is a sulphur abatement technology that allows the use of the HFO by “scrubbing” out the sulphur emission from the exhaust of the ship up to 98% (Kristensen, 2012). There are 3 types of scrubber technology. These are the open loop, (uses only seawater), closed loop (uses the reaction of caustic soda and fresh water) and hybrid (combined both the opened and the closed technology) (Olaniyi & Viirme 2016). The open loop has been demonstrated to be cheaper and smaller. However, it has been subjected to several debates on the environmental implication of using a device that flushes "chemical" back into the sea. Running a closed loop scrubber is most expensive because of the broad treatment of the closed loop circulating water (Lindstad & Eskeland, 2015). The actual costs of the scrubber, i.e. its operating costs and maintenance costs depend primarily on the ship's size, engine capacity and the scrubber technology itself (Atari & Prause 2017).

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With the much talk about climate warming and environmental issues, the use of renewable energies like the LNG has become a formidable competitor to the other usual sources of fuel oil (Rack, 2017). While two of the compliance options, i.e. MGO and the scrubber's installation on board the ships are favourite to ensure a sulphur free shipping, only the LNG solution has proven to have enough ability, in theory, to comply with other regulations such as the NOx (tier III) regulations. The satisfactory conclusion seems to be that when the NOx regulation is finally enacted, the shipowners would not need to install additional systems to prevent NOx emissions (Semolinos et al., 2013). SOx is emission is non-existence with the LNG combustion since LNG does not contain sulphur, while NOx is reduced at least by 85% since the fuel combustion is at about 2.1 to 2.3 air-fuel ration. CO_2 combustion emission also is reduced by 25-30% because of the low hydrogen content of the LNG fuel (Burel et al Taccani & Zuliani, 2013).

The LNG combustion is clean, so there are no smoke or sludge neither are any particulate matters (PM) released. It is not a gainsaying that the LNG seems to meet all the MARPOL standards for operations for SECA, incoming global sulphur cap and other forthcoming emissions regulations since it reduces the SO2, NOx, PM emissions from the ships principally (Det Norske Veritas & MAN Diesel & Turbo 2011). Another reason for the increasing LNG popularity is the seemingly low costs of bunkering; the LNG option is seen as the cheapest in this regard. Unfortunately, other emission compliance alternatives like electricity are said only to remove emissions but increase the greenhouse gases (GHG) effects which further reduces the safe environment (Nerć-Pełka, 2010). Given its recognised successes, many shipowners are deliberating the advantage of using the LNG over other types of compliance options (Adamchak & Adede, 2013) as a universal acceptance that running an LNG powered ship is technically and environmentally friendly (Livanos et al., 2014).

Unavoidably, the adaption of LNG as a cleaner bunker fuel has also put the LNG supply chain under much demand. Suppliers are finding it difficult to create the capacity for the current regasification terminals for broader access to the market, exposing the need for new investors and business models that can play supporting roles to this dynamic market (Talus, 2008). Already in Europe, many ports are working towards the adaptation of their ports to accommodate the LNG facilities, transport and transfers, while new ports are taking initiatives to work on safety and regulations (Wang and Notteboom, 2015). In addition to this, there is project underway in ports like Dunkirk, Antwerp, GATE on the possibilities for building or developing LNG terminals/bunker barge/leading facilities. Baltic Ports Organization (BPO) (2014) also initiated support to improve LNG bunkering facilities across seven ports in the BSR – a project funding of about 3.5 million euro. Other feasibility studies are being carried out on ferry projects in the North Sea, the Baltic and the Mediterranean regarding the LNG use (Semolinos et al., 2013).

Regrettably, even though the use of the LNG is getting more popular in the shipping industry, the infrastructural development has been rather slow especially in taking proper actions to overcome the pressing challenge of growth and distribution (van de Bunt, 2017). A situation that needs a pragmatic, innovative approach to improve the supply and increase the minimal numbers of "players" that marks the LNG industry (Ruester & Neumann, 2009).

The LNG Growth Challenge

Many issues are surrounding the LNG supply have prevented it from gaining broader acceptance in the maritime community. One of such is an economic-related issue, which has always generated controversy when the cost to build an LNG powered engine or retrofit is considered (Ruester & Neumann, 2009). The interest for newly built LNG ships is not so popular among the shipowners because most of them do not have the financial capacity to invest in the project. Although there a lot of newly built ships on order, they are not enough to cover the challenge of increasing the usage of LNG as favourite bunker fuel, more so, this is mostly limited to bulk and containers - a very narrow sector even for the shipping industry (Océane, 2014). Likewise, LNG retrofit does not seems to be favourable among ship owners as well and primarily because of the cost of retrofit (Kumar et al., 2011). On top of

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this is the large needed space for the tanks that is about 4 times higher than is required for other fuel signifying less space aboard for passengers/cargos making LNG retrofitted vessels hard to come by (Semolinos et al., 2013). The major remodelling, the safety requirement and the space needed for the storage tank make LNG option a more suitable capital investment for newly built ships (Burel et al., 2013).

A much-discussed downside of the LNG fuel as a bunker fuel is related to the methane slip caused by the incomplete combustion of methane in the fuel. Methane has been advised to have a 100 year more warming potential compared to CO_2 and about 25% higher than CO_2 in the fuel combustion. If a proper control or elimination technology is not soon discovered, the potential of the LNG as bunkering fuel may be completely erased (Burel et al., 2013).

Ship functionality is heavily dependent on fuel usage, and the fuel usage is dependent on routes flexibility, storage and bunkering especially for bulk carriers and large crude carriers (VLCCs) but for some shipowners, the hardest challenge regarding the LNG is the bunkering (Ruester & Neumann, 2009). Even though the recent fall of oil price has increased the broader economic reach of the LNG, ports infrastructure, cost-effective bunkering and apt expansion provisions needed to improve the offering of the LNG as a realistic option for ship bunkering is lacking (Molitar, 2011). So far, the current existing potential for the LNG fuel infrastructure growth appears only to be within the SECA, and while the use of LNG as a fossil-free fuel for bunkering is gaining ground around the world, a higher percentage of this growth is noticeable across SECA regions (Ikonnikova et al., 2009). The current existing bunkering infrastructures are majorly located within the emissions control areas (ECA) such as SECA but account for only about 24% of the total bunker fuel purchase every year (Adamchak & Adede, 2013).

Distributing the LNG depends mainly on the available market and its size as well as the port size and in doing this, ports are categorised into small or large port. According to Semolinos, et al., (2013), small ports for the LNG supply are ports with the capacity to supply 1 to 5 vessels of about 20 knot LNG fuel consumption such as ferry ports. In small ports, LNG is supplied by trunk or ship because it is cheaper to use the truck for smaller ship supply (Ruester & Neumann, 2006). However, Seo et al. (2016) argued that it is better to build a supply barge to supply all ports whether they are considered small or significant in an economic sense. Pushing this forward, Seo et al. insisted that from the safety point of view, the reduction of the numbers of trucks in the port is essential and this should be a near future consideration when ports clusters are equipped similarly. There seem to be some exceptions for ferries on short sails, which would need to be supplied directly by the truck because of their small storage capacity. The large ports on another hand experience high record LNG fuel bunkering usually higher than 100-knot fuel consumption vessels. These ports need more extensive facilities for bunkering (approximately 15 000 – 30 000 m3 storage) to load bunker truck/ship and to enable ship-to-ship supply (Nerć-Pełka, 2010). Loosely speaking, there are two major groups of participants in the LNG market: the producers and the exporters/importers (Livanos et al., 2014). Usually, the producers are engaged in the upstream chain of the LNG distribution value chain. The importers/exporters are involved in the downstream chain and deal with either some third parties or directly with the ship owners. Depending on the case, the producer goes into agreement with the exporter/importer and may be able to buy according to the terms of the agreement, which can be long or short term. In any case, two significant terms of the agreement usually include the right to resale and payment method (Ikonnikova et al., 2009).

In a detailed manner, typical investors for the LNG downstream distributions are project partners such as states either an unincorporated joint venture structure, incorporated entity, ports, gas expansion operator (a flexible structure that facilitates expansion). There are also companies from the maritime cluster industry that form some profit centre mechanism (as a part of an integrated or partially integrated venture). Sometimes, suppliers form what is called "marketing arrangement" where LNG production is made available to all members for detached marketing (Castillo & Dorao, 2012). However, the conventional structure for the LNG project partnership is the ‘Project Company' where all participants form an incorporated company in the fuel gas country where LNG is situated and jointly own the LNG export plant. Here, the project company procure gas from upstream producers, liquefies the gas and resells the LNG to third-party buyers.

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Consequently, the newly formed company becomes the entity that receives proceedings from the LNG sales through dividends. On another side are the gas reserve owners who make their profit from the feed gas sale or on a netback of the LNG sale price from the liquefaction process (Weems & Hwang, 2013). Since it is established that a significant bottleneck for LNG bunkering is the unavailability of smaller receiving facilities to serve the maritime demand as well as the lack of small-scale LNG tanker ships/trucks to distribute LNG to smaller facilities (Castillo & Dorao, 2012), the LNG sector can take advantage of this situation to increase the LNG market share and demand. If the impending 0.5% global sulphur cap is considered, the LNG infrastructural development is expected to pick up (CE Delft, 2016). There are already speculations that by 2030, LNG demand would be as high as 65 million tonnes (Adamchak & Adede, 2013).

Going forward, the maritime industry must find a way to increase the current capacity of the LNG distribution. Most importantly, while ensuring that LNG is available as at when needed, shipowners need the reassurance of bunkering compatibility. Reliable future supply is a critical enabler to ensure shipowners commitment to any agreement or even the uses of LNG fuel for bunkering (Semolinos et al., 2013). For the downstream LNG developments, a shift in a business's strategy is necessary as a significant alteration in the business model that reinforces tailored fitted supply and distribution.

3 Methodology

Principally, this study set out to build a BM that would demonstrate the integration of an existing infrastructure into a new model to deliver value for the LNG bunkering. Reliable future supply is a crucial enabler to increase LNG supply. Consequently, to capture the market structure, the study looks into the main factors affecting the LNG downstream value chain and integrate them into the $MEC_{LNG.}$ It considers the terms and the length of contracts bearing in mind the most suitable contract for the proposed model (i.e. long-term or spot trade). It furthers considers the cost savings from the LNG model in correlation to other types of diesel fuel. Along these lines, the integrative model and testing were put forward for a regional LNG market. The study used different phases of BM development for research namely: The design phase, the development phase and the validation phase.

Design phase consists of data gathering based on ad hoc research for secondary data (i.e. business reports, websites, news, literature) according to Al-Debei & Avison (2010). Together with structured experts' interviews, profound appreciative insights on the current value chain and the distribution of LNG downstream industry and the energy service contracting (ESC) industry – by extension the MEC was gained. The different LNG business model templates observed in the ad hoc research were used to generate discussions. Interviews were recorded and transcribed for the report. Other information need that came up after interviews were received through emails and phone calls. The companies' representatives corroborated all reports. All mentioned activity led to the first concept of the model.

The combination method for business model development was considered according to Baden-Fuller & Haefliger (2013). With this approach, the Energy Service Company (ESC) business model is re-introduced as the maritime energy contract (MEC) for the LNG supply. Subsequently, elements of the transferred MEC model are combined for the new model. The disadvantage of this method is its risky nature since the model is like a new construction so it can be tricky and complicated. However, according to Rack (2017) transferring a known BM strategy to another likely give room to fill up the loopholes in the concept making it easier to deploy. The work uses the elements of the MEC project design (development, planning, contractual LNG retrofitting, LNG supply, maintenance, maximisation, user incentive, quality monitoring and controlling, price bond and risk, and technical contracting). The model targets the retrofit of an originally MGO-driven ship into an MGO-LNG dual engine vessel.

The MEC is used as the unit of analysis for this research. The proposal is that the LNG downstream actors: importer/exporter/project partners/states/intermediaries/ contractor/ supply services/ local energy companies

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/investor/supplier/contractor (herewith called Project Company for the remainder part of the study) split their supply activities into two to become:

- Fuel supplier: by continuing to import, bunker and supply LNG to shipowners.
- Energy servicing: By providing specialised services to shipowners such as investing in the LNG, retrofit creating dual driven ships that can alternate between fuelling with MGO and LNG.

The development phase explores Fiksdahl & Wamstad (2016) concept of joint planning that opens room for potential partnerships and innovative growth in the maritime industry between the Project Company and shipowners. Although different possible frameworks could be used to analyse and build a strategic BM (i.e. SWOT analysis, Porter's five forces model, McKinsey 7S Framework), Burel et al., (2013) argued that they do not fit the needed intricacies of the maritime industry. To this end, this work focuses on the Business Model Canvas (BMC) by Alexander Osterwalder & Yves Pigneur (2009) framework to build its MEC_{LNG} case.

Osterwalder & Pigneur (2009) proposes a business model canvas that includes a nine-building block of business models to enhance the proposed change. It involves the customer considerations, their value propositions, the channels to raise awareness, relations with the customers or clients, the type of revenue to expect the resources needed the key activities and the type of cost structure most suitable for their plans. The blocks provide perceptivity to essential aspects of the company that has the potential for greater efficiencies and clarifies the internal changes that need to occur. By this means, this study considers the core elements of the proposed model MEC_{LNG} to be in four categories:

1. Customer segments & value proposition made with the future and continuation in mind. Building on this is tapping into a new segment that the customers and the company can enjoy sustainability.
2. Channels that determine how the products are delivered, through whom and in what avenue. How would this be communicated? How can it improve performance?
3. Key activities & resources angle is choices of the partners or cooperation that are needed, i.e. physical, intellectual, informational, human, and financial. Considered partnerships for key resources allocation to create or deliver capture or communicate value.
4. Financials involves transactions, service payment, licensing and costings. How to reduce costs and what channels are most expensive?

The validation phase evaluates the practicability of the proposed model, as it is important to deliberate on the economic characteristics of a chosen model — this consist of empirically refining the research output. Usually, case examples are suitable methods to gather information regarding how business models are implemented (Yin 2003, Baden-Fuller & Haefliger 2013). A ferry ship with an itinerary of the voyage between the Tallinn and the Helsinki ports was used to this end.

For the newly built ship, it is most common to make the comparison between the investment annuity and the anticipated fuel cost savings, while the popular costing methods for retrofits is the evaluation of the payback time (CE Delft, 2016). However, investment appraisal of this work considers the analysis of price trends for the LNG gas fuel and the diesel fuel (MGO) as explained by Atari & Prause (2017). The historical MGO and the LNG fuel prices were based on historical spot market prices in the Port of Rotterdam in the period January 2018 to December 2018. Economic assumptions regarding the LNG-MGO dual powered ship were made compared to the usage of a diesel driven ship normal according to WSF (2011), Semolinos et al. (2013) and Océan (2014).

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4 Results

The LNG Maritime Energy Contracting Business Model (MECLNG)

Producing SECA complaint fuels require high investments, so also is the investment costs for abatement technologies. Current figures indicate a decrease in scrubber installations due to low bunkering prices and low freight rates. Many shipowners are also not financially buoyant to build new LNG powered engines or pay for the LNG retrofit. Diminishing these investment setbacks as well as their business risks demand radical business thoughts and innovations.

The maritime energy contract (MEC) adapted from the Energy Supply Contract (ESC) concept is used to create a business model in the maritime industry using the LNG retrofit on ships for sulphur emissions compliance. It uses the contextual idea of a project company pre-financing the LNG retrofit for a ship through a contractual agreement with shipowner for the constant supply of the LNG to protect the sulphur emission compliance. As with the MEC, the central stimulus for the MEC_{LNG} is lowering the costs of complying with the sulphur regulations for the shipowners and increasing the business scope for the Project Company (PC).

With the MEC_{LNG} business model, the PC delivers not just bunker fuel but provides ‘‘energy solutions" using the LNG retrofitting installations on ships. The PC achieve the energy service package at its expenses according to the precise project prerequisite needed by the shipowner.

First, only MGO-driven ships are eligible for this contract; otherwise, there would be a need for another abatement retrofit on board or a complete remover of the HFO driven engines, a not so desirable outcome. Second, the project will be targeted towards building dual engine driven ship, a bonus for such shipowners who would have added the security of another possibility of sulphur regulations compliance. The project will commence with the contractual agreement between the supplier and the shipowner and is tenable throughout the contract period.
The MEC_{LNG} package as presented to the shipowner and run in the following sequence:

- Project development – planning, costing, agreement and contract
- LNG retrofit
- Running, troubleshooting & optimisation and maintenance

The projected profit is based on the costs of the LNG supplied to and consumed by the ship, costs of retrofit per metric ton and additional costs that include the cost of running and maintaining the LNG engines and other costs defined in the contracts such as risk costs (i.e. technical, outsourcing) and monitoring and control. The contract will also include assurance of quality of service and product that address issues like the methane slip number. As soon as the contract comes to effect, it not only guarantees the supply of fuel but also guarantees a stable price of fuel throughout the contractually agreed period.

Business Model Development

4.2.1. Planning phase

Currently, the LNG sector is small compared to other bunker fuel in maritime with few players, so the study made some assumptions along this line. Even though the LNG looks like the most appropriate compliance option, the economic considerations do not favour its growth. Songhurst (2014) mentioned that one of the ways to cut costs for the LNG downstream is the cooperation between different project owners primarily in the sharing of facilities. The proposed business model project could involve a group of Project Company incorporation or one large PC undertaking the project. The project itself involves the project company dealing directly with the shipowner cutting out the intermediaries or in some cases; the intermediaries could by themselves take up the project if they have access to funding. Of course, it means massive investment, but this group of investors have better access to funding than the shipowner would.

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Project assumptions

The project asset (LNG engine), its features (i.e. pros and cons) and possible opportunities are first considered as shown in Table 1. Funding an LNG driven ship may seem capital intensive, but the pros in building one and the opportunities combined far outweigh its negativity. Among the cons, the capital investment intensity seems to be the aspect with the highest stake for most ship owners, which is not strange.

Table 1: Features of an LNG retrofitted engine that shows opportunities for the shipping sector

Features		Opportunities
Positive features	**Negative features**	
▪ Reduces SOx, PM, NOx, CO2 ▪ Complies with EEDI (Energy Efficiency Design Index) ▪ Potential for a positive NPV: operational savings can be significant, i.e. economically feasible (Low OPEX) ▪ Dual engine possibilities ▪ Engine efficiency ▪ Opportunity/potential for massive growth ▪ Political support ▪ Does not need the installation of SCR ▪ Low engine maintenance	▪ Expensive CAPEX for newly built ▪ Expensive and difficult retrofit ▪ Engine needs lot space for installation ▪ Underdeveloped infrastructure ▪ Underdeveloped experience ▪ Require new trainings for staff for unskilled staff ▪ Safety issues that compound the supply chain ▪ Potentially dangerous Methane slip	▪ Pricing ▪ De coupling from oil price ▪ Expansion ▪ Bunkering points can be increased ▪ Efficient spacing ▪ Significant cost savings ▪ R&D, technology improvement/development ▪ Improved regulatory framework

Source: Authors' construct

The technical project assumptions for a dual LNG/MGO dual engine retrofit are then considered which are different depending on the type of ship. They are:

i. LNG availability within the region
   - Costs of the LNG bunkering facilities
   - Economic comparison of an LNG driven ship to an MGO driven ship
   - Availability of engines and process equipment, as well as maintenance services

ii. Locations of engines installation (important for existing and possible future regulations)
   - The need of full steel casing (to fortify or reinforce the ship, tanks placed on deck)
   - Ship stability when removing, adjusting and installing the LNG engine
   - Other considerations like safety measures, control rooms, piping, and insulation

iii. Cargo space
   - Availability of space to place the engine and tanks
   - Availability of extra space that can be created for cargos/container at locations around or directly on steel casing.
   - Other space (for the cold box and tank inspection)

iv. Local or regional regulations on sea traffic.

4.2.2. Business design phase: MEC_{LNG} modelling

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The Osterwalder & Pigneur (2009) 9 business model building blocks are grouped into four categories to enhance interactive integration. These are customer segments and value proposition; distribution channel; key activities & resources and the financial elements.

a. Customer segments and value proposition

Value proposition will shift from or combine economies of scale approach towards/with an economy of scope concept. The model provides free initial capital investment and scalable investment for the shipowners. It also means cheaper energy solutions delivery to shipowners who do not have technical solution or expertise on the LNG compliance option or its maintenance. Energy is provided cheaper with an offer of regular maintenance. The relationship between the Project Company and the shipowners becomes a co-formulation of a coalition. Services offered and rendered are personalised, assisted and matched to suit each customer.

The model targets ship owners who are financially constrained to fund an LNG engine retrofit for their vessels as key partners/customers. Other possible customers are contractors who can work between different project companies to create a liaison for LNG bunkering infrastructure development. The costs reduction made for the shipowner is cost savings model due to the removal of intermediaries.

b. Channels

The channels of distribution focus on the downstream LNG value chain and becomes vertically integrated or wholly owned except in cases where it becomes necessary to deal with an extra or more parties/intermediaries. The MEC_{LNG} PC have the choice to own distribution from three points: the storage/receiving terminals, the regasification point for example like cases seen in Europe where LNG bunkering services are possible at regasification terminals, the distribution starting point could be at such facilities using trucks. The third point choice is from the large terminal. The small-scale plant is completely removed for this model. The reasons for starting the model at the termination of the upstream value chain is because the upstream stage of the LNG value chain is in most cases heavily politically inclined and often are state-owned or belonging to national oil companies. If private companies are involved, they are usually substantial and integrated. Even though the regasification stage in the downstream is also costly, it is still less expensive than liquefaction and requires less explicit infrastructures than the liquefaction facilities (Boscheck, 2006). Additionally, in liquefaction stage, the assets specificity are very complicated due to the many chains of bureaucracy and political stance of project owners, so third-party access or integration is difficult for the upstream stage making deployment of asset almost impossible.

As commonly practiced and likewise for this model, in the case where the LNG import terminal is far from the final destination or not feasible, a transition terminal (for example stationary onshore LNG tanks and containers) can be established because in most cases, the acceptable nautical regulatory distance for moving trucks are usually not more than 600 km. Offshore terminals can also be used as transitional terminals using vessels or barges although this may not be suitable for small ports, which have much lower fuel supply capacity. Howbeit, small ports can consider permanent bunkering point that fuel straight to the ships but small vessels are not encouraged because according to Semolinos, et al. (2013) there are challenges regarding available slot form small sized vessels. The transitional terminal arrangement can help to decrease investment and logistics costs, shorten logistics time and serve other local customers' needs thereby increasing the PC income. The general distribution can be monitored by the use of electronic data exchange (EDI) for inventory and supply chain management to have a simplified chain like shown in figure 2.

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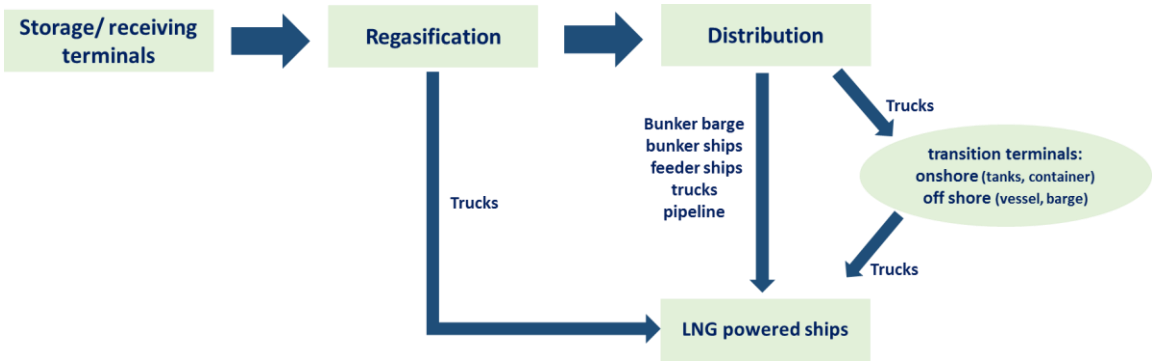
Figure 2: The MEC_{LNG} Integrated Value Chain



Source: Authors' construct

c. Key activities and resources

Key activities will develop into LNG fuel supply with a broader service orientation that aims at sulphur emissions compliance, maintenance and data information exchange and information management. The project company key resources will increase from port bunkering infrastructure for both onshore (LNG tanks, LNG containers) and offshore (ships, truck, barges) to now include LNG engine and its accessories. Intellectual and financial resources will include LNG engineers and experts, service personnel and the engine asset itself. The remaining activities are covered in the LNG maritime energy contract terms and conditions.

d. Financial elements - MEC_{LNG} Costing

As in a standard MEC, considering that the fact that ships are mobile assets that move across the globe especially outside the home country territory, it is advised that five years is used for the contract and adjusted from time to time when the situation calls for them. The LNG maritime energy contracting will consist of three part: (1) supplied energy (2) adjustment costs (3) asset costs - the cost of LNG retrofit and maintenance over the contract period. All calculations contain components connected to current prevailing indices so can be adjusted accordingly within an agreed band of high and low.

The work uses a cruise ship that has an example itinerary of the voyage between the Tallinn and the Helsinki ports. The ship has a dual MGO-LNG engine with the propulsion equipped with five engines - 3 Wärtsilä 12V50DF (11.4 MW/machine) and 2 Wärtsilä 6L50DF (5.7 MW/machine) running about 6.000h/yr. and the engines can be switched automatically from MGO to LNG at 80% of the full load. Fuel switch over takes about a minute. For this study, it is assumed that the LNG is run through the year. Each leg of the journey is an average of 2.5 - 3 hour three times a day. The vessel uses a total fuel consumption of 60m/t a day of LNG.

Assuming the ship operates 340 days a year since it is a cruise ship and both ports are within SECA with the ship sailing 100% within SECA without fuel switch. The model calculation does not combine other system calculation, i.e. energy need for power generation like the battery saving method/system. All investment costs are calculated in nominal euros.

Cost of supplied fuel gas (LNG)/mt:

The cost of energy (CFP_{LNG} [€/mt]) is as the average range calculation of the LNG baseline price according to official statistics between the 1-12/2018 and the spot price for LNG supply per metric tonne €/mt at 1/12/2018 which is 438.60/mt.

Annual asset costs

The LNG system retrofit initial investment costs (i.e. engine design, costs for main engines, gas storage and supply systems) is 5.4 million euro (Océan, 2014). By using a linear depreciation period of 20 years and a 6 % interest rate

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p.a., the annual nominal asset value is calculated to be 556,000 euro p.a. Together with the annual maintenance costs (i.e. lubrication oil consumption, maintenance and repair of the engines and gas systems) of 282, 585 (WSF, 2011), the annual project asset costs will be 841,585 €/a. In order to calculate the minimum asset price per metric tonne, the annual asset cost (841,585 €/a) is divided by the total annual cost of the LNG consumption multiplied by the daily LNG consumption and multiplied by the number of operating days (i.e. 438.60€/mt x 60mt/day x 340 days). The resulting calculation equals to 8 947 440 €/yr. which is ≈ 9.4% of NLG price/mt approximately yielding 41.2 €/mt.

Adjustment costs

The adjustment costs (AAC_{LNG} [€/a]) is calculated as an adjustment for November 2018 based on the current Estonian consumer goods index at 01.01.2018 (TE, 2018a), the average salary index at 01.01.2018 (TE, 2018b) at a fictive fuel price of 438€/mt from 01.01.2018.

Using: $$\mathbf{AAC\ [€/a] = LP_0\ [€/a] \times (0.5 + 0.3 + \frac{I}{I_0} + 0.2 \times \frac{L}{L_0})} \quad (1)$$

I_0: for the 01.01.2017 - 196.76 (i.e. TE, 2018a)
I: based on the same index for 1.11. 2017: 204.16
L: based on November 2017 - 126.69 (i.e. TE, 2018b)
L_0: based on the same index for 01.11.2017: 122.26
Cost of asset [€/a] * [0.5 + (0.3*204.6/196, 76) + (0.2 *126.69/122.26)]
=841,585 *1.01856407
=858,416.7€/a
= 42.02 €/mt

TOTAL COST OF MEC_{LNG}

The total costs of LNG Maritime Energy Contract (MEC_{LNG})

Thus, the MEC_{LNG} costs in the sum of the defined three components will be:

$$\mathbf{MEC_{LNG} = CFP_{LNG} + CA_{LNG} + AAC_{LNG}} \quad (2)$$

Where:

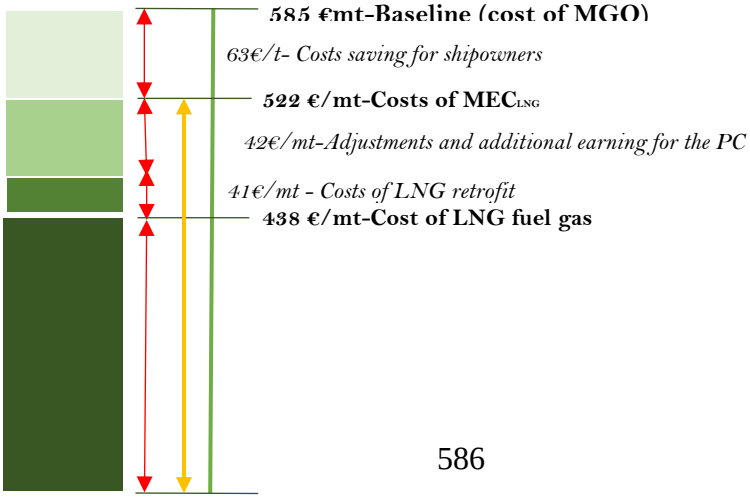
CFP_{LNG}: Cost of energy supply [€/mt]; CA_{LNG}: Cost of asset [€/mt]; AAC: Adjustments [€/mt]

LNG_MEC Price/tonne = (438.60 + 41.20 + 42.02) = 522€/mt

The MGO price at the same time (1.11.2018) 585 €/mt is used calculate the cost savings

Cost saving for shipowner = 585.08 – 522 = 63€/mt

Figure 3: Cost savings in MEC model (Authors' calculations)



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Although there is a substantial gap between commercial contracts for HFO bunker and LNG, the authors have carefully adapted the MEC energy contract on a short-term bases so that as it slowly evolves, situations become clearer and elaborated, adjustment can be made, and the contract terms and conditions redefined as needed when situations call for it. In addition to this, the assets functionalities are supported by different elements of the business model (table 2) that makes distribution less complicated, and if this were to be successfully transferred to LNG, the demand for LNG would certainly increase since supply issues have been taken care off. The model implies that it is very different and radical from the usual distribution models.

Table 2: Business Model framework for MEC_{LNG}

Customer segments & value proposition	Channels	Key activities & resources	Financials
Value Economies of scale += economics of scope Cheaper emission reduction Price differentiation (Cheaper energy supply) Service differentiation (Full custom built service) Risk reduction **Key customers** Ship owners /shipping companies/shipping operators Suppliers (long term contract) **Customer relationship** Co-formulation/alliance Long/mid-termed contract Personal Efficiency	**Distribution** Supply chain Vertical integration (sometimes horizontal) Increased efficiency **Communication** Monitored by EDI Personal	**Supply Distribution** Innovation Service Economics of scales **Resources** Expert staff LNG engines Tanks Containers Trucks Bunker barges bunker ships feeder ships trucks	**Cost structure** Low cost Hedged costs Shared profit **Revenue streams** Sales Service Innovation Shared profit

Source: Adapted from Osterwalder (2004)

5 Discussions

Naturally, LNG supply is in fierce competition with other sources of energy like battery, coal, oil, nuclear energy and other renewables like Hydropower, solar power and so on. Hence, its survival in the oil and gas and maritime

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sector is heavily reliant on business models that are diversified and flexible and can guarantee reliable supply. This will be a type of supply diversification within a market that can increase energy, security and protect the environment and at the same time open new innovative opportunities for enhanced and quality living. Along these lines, the MEC_{LNG} combines two purposes: lowering sulphur regulations compliance costs for the shipowners and increasing the supply and distribution of the LNG as a compliance option that guarantees an environmentally friendly maritime sector.

The proposed innovative MEC_{LNG} business model is created as a central approach to achieve extraordinary events in the maritime sector because it is actionable. The reasons are that since the LNG/MGO dual engine ship is foremost a transferred land-based power plants experience and technology to shipping and likewise, the practicable MEC_{LNG} model principle can be projected as a successful energy concept that instils this transfer. The concerted activities and structure will ensure (a) an environmental benefit to achieve remarkable emissions reduction. (b) Money savings on initial costs of investment for the shipowners that exposes them to minimise risks. (c) Employment possibilities (d) Reduced operational costs where the shipowners can concentrate on the transport business. (e) Shipowners are free from the energy efficiency responsibility like the methane slip, which is passed over to the owner of the LNG engine. (f) Cheap technology and expert support for the shipowners. (g) A scalable investment opportunity for the shipowners (h) Earnings are increased for both parties (i) Customised contract for each project as suitable for both contractual parties. (j) The LNG project company can attract more customers by shifting investment risk to themselves, so the shipowners are more opened to the delivery of the model. It is common knowledge that various industry operations increase knowledge and improve economies of scope that leads to positive outcomes. In other words, the success of the MEC_{LNG} can be a direct success for LNG distribution, as more players become active in the value chain, the ability to break the insistent monopolistic nature in the LNG sector increase and the process that enhances the hitherto low transaction rate intensify.

Although Océane (2014) explained that a main engine dual tank retrofit reduces the engine output significantly, be it as it may, according to experts if the vessel is considered for a 100% full LNG load operation, then its efficiencies can be increased. This summation can be because even though the LNG has a high investment expenditure, in the short or long-term reasoning, the savings are significant. Washington State Ferries (2011) made the same judgement. Therefore, a modification of an existing diesel engine to a gas-operated vessel will bring a significant reduction to the vessel's operational costs. Most experts interviewed agreed that a dual engine can save up to 1 million dollars per vessel when compared to a regular diesel-powered engine. Although the modification process is high in capital costs, different literature (i.e. Burel et al., 2013; Océane, 2014; CE Delft, 2016) also agree that the reduced operational costs negate the initial high capital costs and they all placed the payback period to about 3 to 5 years.

Considering the new global sulphur cap, the demand for the MGO/MDO will increase and cascade into an urgent need to increase diesel bunkering infrastructures in the ports, a case that is likely to regrettably take precedence over other infrastructural development such as the LNG's (Semolinos et al., 2013). Admittedly, nothing is certain yet, but the cost of fuel may yet rise again, and supply may be hindered. However, despite this, the sulphur rules will be continually be upheld so that the onus lies on each related stakeholder to find ways to comply as the discussions on enforcement, default and penalties have increased in recent times.

Unfortunately, the reduced fuel prices have wasted many compliance investments made by the shipowner. If the MEC_{LNG} were to be successfully transferred to the LNG, it is expected to increase demand for LNG and consequently improve the supply channel. Yes, the LNG project may look complex when the number of the stakeholders involved are considered, but, the managerial implications of the MEC model in this context is the harmonisation of different value networks that would enhance functionalities supported by different elements that make LNG distribution less complicated. This demand that the parties involve develops adaptable project portfolios.

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A further inference of the model is an experimental form of distribution model. Since the oil and gas landscape has grown and changed with more changes expected in the future, the customarily exclusive club of LNG players can no longer be restricted to only a few multinational integrated oil companies. Small and medium-sized companies now have the potential to have a place in the club or collaborate to improve flexibility. However, for a successful implementation, new bunkering standards have to be enacted globally so that it would be possible for LNG driven ship especially deep sea ship to easily bunker anywhere in the world.

Concisely, the prospect of LNG becoming a competitive fuel in the maritime industry would entail more medium and small-scale ports establishing and investing in LNG bunkering facilities as explained by Nerć-Pełka (2010) and then directly collaborate with the shipowners. For example, the port of Helsinki is known for its separated quays with different structures and functionalities for bunkering the ship-to-ship system, and this has seemed to work for the LNG distribution in the port (Castillo & Dorao, 2012). Considering this, project companies who invest in port infrastructures may go a step further to install the contractual LNG engines on ships to secure their investment. They are then able to attract loyal and consistent customers and can hedge their investments. They not only get their full money back, but they also do so with interest rates that double their investment within 1-3 years of investment. The LNG distribution challenge is a situation interconnected to the different element: first is the availability of port facilities that can produce stock and supply LNG the next is the availability of ports with fuelling quays, line-haul boats or barges that can transport heavy goods such as the fuel gas for bunkering. Without the assurance of a guaranteed, supply and low cost of bunkering, shipowners would not be interested in investing in LNG powered vessels. The same goes for investors for LNG infrastructure development. The proposed model can be used to create and enlarge the market and at the same time harmonise the collaboration between port developers / investors / suppliers and ship owners.

Paradoxically, most times, too much attention is on the expensive nature of retrofitting ships for LNG that discourages investment in the LNG option for sulphur compliance but, the unsung message that needs to be loud and clear is that yes, retrofitting ships to LNG is possible and is economically viable. It is true that industrial and economic development are major sustainability issues that need to be carefully worked out to ease any industry transition (Marolt et al., 2016). An advantage of this business model is the increase of the competitiveness of the LNG to improve the economies of scale and technology development along all LNG value chain.

Conclusion

This paper advocates for small and medium companies to create a niche for themselves to boost the availability of LNG bunkering in the maritime industry, the fact is, this business is not for the faint at heart or the undercapitalised. The proposed short-term trading contract can is used as a tool to reduce the costs and risks along the value chain by creating and increasing diversity in the supply chain in an industry known for its rigidity. Flexibility and dynamism can create healthy competitiveness in a complex supply chain.

A direct contract with shipowners can remove the LNG quality issues regarding the methane slip; this is an essential aspect because the methane number is also said to be related to the engine efficiency. The likely risk of not fulfilling this bunkering specification can be reduced / curtailed / covered in the contractual agreement connoting that the contract will be based on product specifications clauses and other clauses.

The uncertainties that surround the LNG regulatory framework is an obvious impediment its growth. Sadly, gas fuel is still not finding more extensive use outside shipping, although the growth and availability are slowly increasing. So far, the most substantial use of natural gas outside shipping is in the industrial heating followed by electric power generation. A precise and established regulatory framework can ensure a particular development of the LNG market. This framework should put into consideration in the entire value chain of the distribution process.

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As long as there is no specific framework for the LNG, the risk /stake on investments will always be high due to a potential non-compliant ex-post.

References:

Abadie, L. M., Goicoechea, N., & Galarraga, I. 2017. Adapting the shipping sector to stricter emissions regulations: Fuel switching or installing a scrubber?. Transportation Research Part D: Transport and Environment, 57, 237-250. https://doi.org/10.1016/j.trd.2017.09.017

Adamchak, F., & Adede, A., 2013. LNG as a marine fuel, 17th International conference and exhibition on Liquefied Natural Gas (LNG 17), Houston, 17th April 2013 .

Al-Debei, M. M., & Avison, D. 2010. Developing a unified framework of the business model concept. European Journal of Information Systems, 19(3), 359-376. https://doi.org/10.1057/ejis.2010.21

CE Delft 2016. Assessment of Fuel Oil Availability Final report Delft, CE Delft, July 2016

Atari, S. and Prause, G., 2017. Risk assessment of emission abatement technologies for clean shipping. In International Conference on Reliability and Statistics in Transportation and Communication (pp. 93-101). Springer, Cham. https://doi.org/10.1007/978-3-319-74454-4_9

Baden-Fuller, C., & Haefliger, S. 2013. Business models and technological innovation. Long range planning, 46(6), 419-426. https://doi.org/10.1016/j.lrp.2013.08.023

Baltic Ports Organization. 2014. LNG in Baltic Sea Ports - Stakeholders Platform. http://www.oresundskraft.se/helga

Barroso, L. A., Rudnick, H., Mocarquer, S., Kelman, R., & Bezerra, B. 2008. LNG in South America: the markets, the prices and the security of supply. In Power and Energy Society General Meeting-Conversion and Delivery of Electrical Energy in the 21st Century, 2008 IEEE (pp. 1-6). IEEE. https://doi.org/10.1109/PES.2008.4596232

Bialystocki, N., & Konovessis, D. 2016. On the estimation of ship's fuel consumption and speed curve: A statistical approach. Journal of Océan Engineering and Science, 1(2), 157-166. https://doi.org/10.1016/j.joes.2016.02.001

Boscheck, R. 2006. Assessing "new" upstream business models. IMD International, 1501, 2006-06.

Burel, F., Taccani, R., & Zuliani, N. 2013. Improving sustainability of maritime transport through utilization of Liquefied Natural Gas (LNG) for propulsion. Energy, 57, 412-420. https://doi.org/10.1016/j.energy.2013.05.002

Castillo, L., & Dorao, C. A. 2012. Consensual decision-making model based on game theory for LNG processes. Energy conversion and management, 64, 387-396. https://doi.org/10.1016/j.enconman.2012.06.014

Danish Maritime authority 2012. North European LNG Infrastructure Project. A feasibility study for an LNG filling station infrastructure and test of recommendations.

Det Norske Veritas AS, MAN Diesel & Turbo 2011. Quantum 9000 two stroke LNG. Available from: http://www.mandieselturbo.com/files/news/filesof16391/5510-0108-01ppr_low.pdf

Fiksdahl, M., & Wamstad, M. G. 2016. Business models in the maritime industry-A study of how Norwegian maritime actors apply and innovate their business models (Master's thesis, NTNU).

Gerlitz, L., Philipp, R., & Beifert, A. (2017, October). Smart and Sustainable Cross-Sectoral Stakeholder Integration into Macro-Regional LNG Value Chain. In *International Conference on Reliability and Statistics in Transportation and Communication* (pp. 112-126). Springer, Cham.

Gu, Y., & Wallace, S. W. 2017. Scrubber: A potentially overestimated compliance method for the Emission Control Areas: The importance of involving a ship's sailing pattern in the evaluation. Transportation Research Part D: Transport and Environment, 55, 51-66. https://doi.org/10.1016/j.trd.2017.06.024

Ikonnikova, S., Volkov, D., Gulen, G., BEG, C., & Foss, M. 2009. Strategic model of LNG arbitrage: analysis of LNG trade in Atlantic Basin. In 32nd International Association for Energy Economics Conference Proceedings.

IMO 2009. Regulations for the prevention of air pollution from ships, revised MARPOL Annex VI. London

IMO 2015. Guidance on the application of regulation 13 of MARPOL annex VI Tier III requirements to dual fuel and gas-fuelled engines. MEPC.1/Circ.854. London. http://www.imo.org/en/MediaCentre/PressBriefings/Pages/MEPC-70-2020sulphur.aspx

Jiang, L., Kronbak, J. and Christensen, L.P. 2014. The costs and benefits of sulphur reduction measures: Sulphur scrubbers versus marine gas oil. Transportation Research Part D: Transport and Environment, 28, pp.19-27. https://doi.org/10.1016/j.trd.2013.12.005

Kadavias, S., & Kostas, L. 2015. Six degrees of innovation Predicting transformative business models. A white paper produced in collaboration with AT&T. university of Cambridge. Judge Buisness School.

Kristensen, H. O. 2012. Energy demand and exhaust gas emissions of marine engines. Clean Shipping Currents, 1(6), 18-26.

Kumar, S., Kwon, H. T., Choi, K. H., Cho, J. H., Lim, W., & Moon, I. 2011. Current status and future projections of LNG demand and supplies: A global prospective. Energy Policy, 39(7), 4097-4104. https://doi.org/10.1016/j.enpol.2011.03.067

Lee, S.W., Ryu, J.W. and Min, W., 2003. SK hydrodesulfurization (HDS) pretreatment technology for ultralow sulfur diesel (ULSD) production. Catalysis Surveys from Asia, 7(4), pp.271-279. https://doi.org/10.1023/B:CATS.0000008166.74672.db

Lindstad, H. E., & Eskeland, G. S. 2016. Environmental regulations in shipping: Policies leaning towards globalization of scrubbers deserve scrutiny. Transportation Research Part D: Transport and Environment, 47, 67-76. https://doi.org/10.1016/j.trd.2016.05.004

Lindstad, H., Sandaas, I., & Strømman, A. H. 2015. Assessment of cost as a function of abatement options in maritime emission control areas. Transportation Research Part D: Transport and Environment, 38, 41-48. https://doi.org/10.1016/j.trd.2015.04.018

Livanos, George A., Theotokatos, Gerasimos, Pagonis, Dimitrios-Nikolaos 2014. Techno-economic investigation of alternative propulsion plants for ferries and RoRo ships. Energy Conversion and Management. https://doi.org/10.1016/j.enconman.2013.12.050

Marolt, M., Lenart, G., Maletič, D., Borštnar, M. K., & Pucihar, A. 2016. Business model innovation: insights from a multiple case study of Slovenian SMEs. Organizacija, 49(3), 161-171. https://doi.org/10.1515/orga-2016-0015

Molitar, E. 2011. Infrastructure development for access to LNG bunkering in ports. SSPA.Sweden AB https://www.sspa.se/alternative-fuels

Morris, M., Schindehutte, M., & Allen, J. 2005. The entrepreneur's business model: toward a unified perspective. Journal of business research, 58(6), 726-735. https://doi.org/10.1016/j.jbusres.2003.11.001

Neréc-Pełka, A. 2010. Logistics and supply chain effectiveness measure areas in LNG companies. Electronic Scientific Journal of Logistics, ISSN. http://www.logforum.net/vol6/issue3/no7

Océane B., 2014. LNG – A Cost-Efficient Fuel Option? Drivers, Status and Economic Viability. A DNV-GL presentation 15.05.2014

Olaniyi, E.O., Atari, S, Prause, G. 2018a. Maritime Energy Contracting in clean shipping, Transport and Telecommunication Journal, 19(1), 31–44, ISSN (Online) 1407-6179. https://doi.org/10.2478/ttj-2018-0004

Olaniyi, O.E., Prause, G., Bakkar, Y. 2019. Entrepreneurial compliance opportunities for maritime fuel producers. *Entrepreneurship and Sustainability Issues*, 6(4), 1550-1565. https://doi.org/10.9770/jesi.2019.6.4(1)

Olaniyi E.O., Gerber P., Prause G. 2018b. Strategic Energy Partnership in Shipping. In: Kabashkin I., Yatskiv I., Prentkovskis O. (Eds) Reliability and Statistics in Transportation and Communication. Lecture Notes in Networks and Systems, 36: 102-111. Springer, Cham. https://doi.org/10.1007/978-3-319-74454-4_10

Olaniyi, E. O. 2017. Towards EU 2020: An Outlook of SECA Regulations Implementation in the BSR. Baltic Journal of European Studies, 7(2), 182-207. https://doi.org/10.1515/bjes-2017-0016

Olaniyi, E.O. and Viirmäe, M. 2016. The Economic Impact of Environmental Regulations on a Maritime Fuel Production Company. Research in Economics and Business: Central and Eastern Europe, Vol. 8, No. 2, pp. 58-84. 41. http://www.rebcee.eu/index.php/REB/article/view/93

Osterwalder, A. 2004. The Business Model Ontology-a proposition in a design science approach. http://www.hec.unil.ch/aosterwa/PhD/Osterwalder_PhD_BM_Ontology.pdf

Osterwalder, A. and Pigneur, Y. 2009. Business Model Creation. Modderman Drukwerk: Amsterdam.

Paulauskas, V., Paulauskas, D., Placiene, B., Barzdziukas, R., Maksimavicius, R., Ronkaityte, I., & Henesey, L. (2017). Optimization modelling of LNG supply chains for development: Case study of Lithuania and Latvia. In International Scientific Conference Transport Means, Juodkrante, Lithuania (pp. 762-765). Kaunas University of Technology.

Platts (2016). Platts 2016. The IMO's 2020 Global Sulfur Cap: What A 2020 Sulfur-Constrained World Means for Shipping Lines, Refineries and Bunker Suppliers. https://www.platts.com/IM.Platts.../SR-IMO-2020-Global-sulfur-cap-102016.pdf

Prause, G.; Reinhold, K.; Järvis, M.; Olaniyi, E.; Tint, P. 2019. The Socio-Economic Impact of Green Shipping: A Holistic View from the Baltic Sea Region. In: Kabashkin, I.; Yatskiv, I. Reliability and Statistics in Transportation and Communication. Berlin: Springer. (Lecture Notes in Networks and Systems). https://doi.org/10.1007/978-3-030-12450-2_59

Rack, V. 2017. Business model innovation in the oil and gas supply industry (Master's thesis, Nod University). 47.

Ren, J. and Lützen, M. 2015. Fuzzy multi-criteria decision-making method for technology selection for emissions reduction from shipping under uncertainties. Transportation Research Part D: Transport and Environment, 40, pp. 43-60. https://doi.org/10.1016/j.trd.2015.07.012

Ruester, S., & Neumann, A. 2006. Economics of the LNG Value Chain and Corporate Strategies An Empirical Analysis of the Determinants of Vertical Integration. In 10th Annual ISNIE Conference.

Ruester, S., & Neumann, A. 2009. Linking alternative theories of the firm–a first empirical application to the liquefied natural gas industry. Journal of Institutional Economics, 5(1), 47-64. 1) https://doi.org/10.1017/S1744137408001215

Schinas, O. and Stefanakos, C. N. 2012. Cost assessment of environmental regulation and options for marine operators. Transportation Research Part C: Emerging Technologies, 25, 81-99. https://doi.org/10.1016/j.trc.2012.05.002

Semolinos, P., Olsen, G., & Giacosa, A. 2013. LNG as marine fuel: challenges to be overcome. In 17th International Conference & Exhibition on Liquified Natural Gas.

Seo, S., Chu, B., Noh, Y., Jang, W., Lee, S., Seo, Y., & Chang, D. (2016). An economic evaluation of operating expenditures for LNG fuel gas supply systems onboard ocean-going ships considering availability. Ships and Offshore Structures, 11(2), 213-223. https://doi.org/10.1080/17445302.2014.984389

Songhurst, B. 2014. LNG plant cost escalation. Oxford Institute for Energy Studies.

Stopford M. 2009. Maritime economics, Routledge 2nd Edition, London and New York.

Sys, C., Vanelslander, T., Adriaenssens, M., & Van Rillaer, I. 2016. International emission regulation in sea transport: Economic feasibility and impact. Transportation Research Part D: Transport and Environment, 45, 139-151. https://doi.org/10.1016/j.trd.2015.06.009

Talus, K. 2008. Access to Gas Markets: A Comparative Study on Access to LNG Terminals in the European Union and the United States. Hous. J. Int'l L., 31, 343.

TE 2017a. Consumer Price Index/Estonia. https://tradingeconomics.com/estonia/consumer-price-index-cpi

TE 2017b. Labour costs/Estonia. https://tradingeconomics.com/estonia/labour-costs

Van de Bunt, L. L. 2015. Strategic and tactical decision making in a dedicated transportation service in the chemical cluster of Rotterdam–A business model.Masters' thesis Department of Industrial Engineering & Innovation Sciences. tue.nl.

Van der Vliet, L. 2017. The business model of Dutch container trucking companies–an analysis of internal change for 2016-2021. Masters' thesis Urban, Port and Transport Economics, Erasmus University Rotterdam.

Wang, S., & Notteboom, T. 2014. Shipowners' structure and fleet distribution in the liquefied natural gas shipping market. International Journal of Shipping and Transport Logistics, 6(5), 488-512.

Wang, S., & Notteboom, T. 2015. The role of port authorities in the development of LNG bunkering facilities in North European ports. WMU Journal of Maritime Affairs, 14(1), 61-92. https://doi.org/10.1007/s13437-014-0074-9

Weems, P. R., & Hwang, M. 2013. Overview of issues common to structuring, negotiating and documenting LNG projects. Journal of World Energy Law and Business, 6(4), 267-299. https://doi.org/10.1093/jwelb/jwt016

WSF, 2011. Life Cycle Cost Analysis: Car Ferry LNG Fuel Conversion Feasibility Study for Washington State Ferries Seattle, WA, July 2011. The Glosten Associates, Inc.

Yin, R. K. 2003. Case study research: design and methods (3rd ed.). Thousand Oaks, Calif.: Sage Publications, 364p.

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ECONOMIC ASPECTS OF THE RESOLUTION OF THE ISSUE OF FOOD SECURITY: A CASE STUDY

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Abstract. This paper examines some of the key issues related to ensuring Russia's food security. The focus on meeting people's needs by providing them with food produced domestically predetermines the objective need to develop further the nation's food market and create additional jobs, which should help improve people's standard of living and quality of life. The food market in a megalopolis is one of the largest in the country, which predetermines the complexity of its formation, with some of the key problem areas including the social and economic imbalance between low- and high-income citizens, issues with the development of trade infrastructure, the excessive number of intermediaries, etc.

Keywords: food security; dependence on imports; government policy; balance of trade, trade infrastructure; food quality; system for monitoring; Russia

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1. Introduction

Officially, the issue of food security was first brought up at the 1974 World Food Conference in Rome, where the term was introduced and the concept was discussed extensively.

Today, food security is construed as a nation's ability to meet, through sources and resources of its own, the need of its population for food in compliance with medical and scientifically substantiated consumption standards. Every nation establishes its own level of food security. Russia's current level, across key food products, is 85% (Barasheva, 2016; Poltarykhin, 2015).

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Food security was not a major issue in the USSR, except when it comes to certain products of tropical origin. Following the Union's collapse, Russia was inundated with imported food products, many of which were a lot cheaper than their domestic counterparts due to considerable overproduction in many of the developed countries. Imported products came in beautiful packaging that had vibrant colors and foreign letters printed on it, which was a major factor in attracting potential consumers in Russia (Akhmetshin, 2018; Barcho, 2018).

However, for the most part, imported food was not always high-quality, which, for instance, was the case with frozen meat and canned food. Nevertheless, imported food started to offer serious competition to domestic manufacturers of food raw materials and finished products. As a consequence, a great many domestic food manufacturers ended up bankrupt, which resulted in a considerable decline in the production and sale of food products. By the late 1990s, on many of the strategic food products, Russian production totaled 20–35%, i.e. within a space of just a couple of years the nation experienced a significant decline in provision of domestic food to the population. In an attempt to resolve these issues, Russia started to increase its food imports – and, thus, depend, to a certain degree, on imports, with prices for goods, including food, increasingly dictated by importers. In other words, there was an "expansion", i.e. Russia's food market (and some of its other markets) had been invaded, with its dependence on imports on certain food products reaching 60–70% (Kundius & Poltarykhin, 2010; Poltarykhin, Ganieva, Churin, Melnikov, & Mikhaylushkin, 2017).

2. Methods

The state's current policy aimed at resolving the nation's food security issues has provided a positive vector for development, bringing into being a trend of economic growth among entities within the food market. For instance, in 2010 the government signed into law the Doctrine on Food Security, which would set out the key objectives and areas for the development of Russia's agro-industrial complex (Decree of the President of the Russian Federation No. 120, 2010). However, starting in 2014, the Russian economy has been subjected to considerable pressure on the part of foreign countries, which have imposed a set of economic sanctions on Russia, and that has led to a decline in economic growth across a plethora of sectors (e.g. Vorotnikov et l., 2019). Russia's countermeasures, aimed at limiting a certain portion of food imports, have facilitated a drop in competition in the food market, which has resulted in an increase in production volumes, helping take some of the heat out of the issue of food security. Based on expert estimates, the import of food products from countries that have introduced sanctions against Russia totaled in 2017 just 12% ($43.1 billion) (Barasheva, 2016; Kundius & Poltarykhin, 2010; Poltarykhin et al., 2017; Krivko et al., 2019).

It may be concluded from reports by the Ministry of Agriculture of the Russian Federation that currently the nation is pretty much self-sufficient on most of the key types of food: by 85–89% on flour, sugar, macaroni, and poultry and by 90–95% on vegetable oil, confectionery, and canned meat. On milk and dairy products, Russia is self-sufficient by 78–80%, with the rest supplied from Belarus, which is ready to ramp up sales further. In 2015, for the first time since 1992, domestic producers were able to almost close off the nation's need for meat and meat products – by 86%, and that is against the minimum level of 50%. The nation is still vulnerable when it comes to fish and fish products, with nearly 40% bought by domestic retail chains from Norway (Barasheva, 2016; Poltarykhin, 2015; Rosstat, 2017).

Each year, nearly $11 billion is spent on the import of food which cannot be produced in Russian conditions, like tea, coffee, bananas, citrus fruits, etc. Having said that, despite the latest political and economic tensions around the world and, as a consequence, an overall natural decline in economic growth across a variety of sectors, the domestic food market is displaying stable development, which, in large part, is the result of Russia's countermeasures aimed at banning most food imports (Voronkova & Sorokina, 2019; Voronkova & Akhmetshin, 2018; Ziuzya & 2019).

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The nation, surely, should never be complacent about its food security, as only acting in an articulate, purposeful, and consistent manner in implementing relevant plans and programs for development can facilitate the resolution of the issue of food security and boosts in import substitution. Indicative (state) planning should, of course, be reflected in its regional component, Moscow, as a constituent region of the Russian Federation, being the most capacious of the nation's food markets and, thus, providing a vector for national development as a whole (Sycheva, 2018; Gamidullaeva, 2018).

3. Results

Food security in the city of Moscow is construed as a set of organizational, economic, and social conditions that govern the city's development through the prism of the physical availability of high-quality and safe food, required to sustain an active and healthy lifestyle, and the ability to provide it in a rational manner to each and every resident.

In 2006, at the legislative level Moscow saw the passage of Law of the City of Moscow No. 39 'On Food Security in the City of Moscow' of July 12, 2006, designed to regulate one's managerial and conceptual understanding of the objectives and subject matter of government regulation in the area of food security in Moscow, as a constituent region of the Russian Federation. The law entrenched some of the key mechanisms for ensuring food security for the city's executive authorities (Moscow Mayor official website, 2006). However, the global financial crisis which began in 2008 brought into being a set of new objectives for resolving the above issues. Presently, the city's food policy is also predicated on the Doctrine on Food Security in the Russian Federation and the State Program for the Development of Agriculture and Regulation of Markets for Agricultural Produce, Raw Materials, and Food for the Period through to 2013–2020, having in consideration the characteristics of the city of Moscow (Glotko, 2018; Polyakova, 2018).

A key characteristic of the city of Moscow, as a constituent region of the Russian Federation, is that the megalopolis's food market is one of the largest in the country, with nearly 35 tons of food consumed daily. Based on expert estimates, starting in 2018 its food consumption will exceed 13.5 million tons per year. In this regard, resolving the issue of food security is of special significance for Moscow, its development directly dependent on the existing goods distribution system and, consequently, balance of trade (Deren, 2017; Kundius & Poltarykhin, 2010).

Of no less significance is the socio-economic imbalance between low- and high-income citizens, which currently is estimated at 28 times, whereas in developed European countries this gap is 8 times (Deren, 2017). Admittedly, this comparison must be adjusted based on the fact that the city of Moscow ranks first globally in the number of dollar billionaires. Note that against a backdrop of this considerable differentiation in income among residents there are also considerable differences in the structure and level of food consumption across different income groups. For instance, those within the high-income segment of Moscow's population consume 2.2 times more meat and meat products per person, 1.9 times more milk and dairy products, 2.1 times more fish and fish products, and 2.5 times more berries and fruits. Note that those within the population's low-income segment whose income is below the subsistence minimum account for 12.3% of the megalopolis's total population. This, in turn, is giving rise to a risk of food inflation, as the greater is the relative share of a person's expenditure on food within the overall spending, the greater is the risk of negative inflationary consequences arising (Deren, 2017; Kundius & Poltarykhin, 2010; Rosstat, 2017).

To meet the needs of Moscow's population, food is supplied to its market from over 100 different countries and 50 domestic regions. In 2016, Moscow's food retail turnover totaled 20.7% of Russia's total turnover, with its public catering turnover nearing 15%. Note that in the same year Moscow residents' average level of consumption of key food products exceeded the rational consumption norms that are currently recommended – e.g., meat and

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meat products – by 32%, cereals – by 19.4%, macaroni products – by 6.5%, and tomatoes and cucumbers – by 12.8%, with their consumption of fish and fish products remaining at the level of recommended norms (21.6 kg per person per year). Below the recommended norms of consumption were the figures on milk and milk products – by 22.6%, potatoes – by 47.7%, fruits and berries – by 23.4%, and vegetables and cucurbits – by 24.3%. Also lower was the actual food intake of certain items in relation to recommended norms of consumption in Russia, more specifically on vegetable oil – by 26%, cucurbits and vegetables – by 23%, milk and milk products – by 21%, and berries and fruits – by 9%, with greater figures posted against those in developed foreign countries. The subsequent increase in the level of consumption of food products is directly associated with boosts in real household income in Moscow (Rosstat, 2017; Moscow Mayor official website, n.d.).

A significant issue in ensuring Moscow's food security is that there are too many intermediaries around, which largely makes the goods distribution system unstable in relation to the changing state of affairs in the Russian and global markets for food. A major portion of food brought into Moscow is subsequently transited to other regions of Russia (some of it getting processed additionally). This kind of logistics places considerable strains on the city's warehouse and transportation infrastructure and affects its environment. In addition, the city's use of its warehouse spaces is a lot less efficient today than what is prescribed by international standards. More specifically, the current ratio of storage/warehouse area to showroom/retail area is 1:1 in Moscow, 3.5:1 in Moscow Oblast, 8:1 in the US, and 10:1 in most developed European countries. Without question, it is pretty hard to have a large number of warehouse spaces in a megalopolis like Moscow, but that is what governs infrastructural risks, which may affect the economic and physical availability of food products to Moscow residents (Shevkunova, 2014; Food security issues discussed in Moscow, 2012).

The effects of the global financial crisis and the economic sanctions imposed on Russia by the West have largely triggered an increase in volatility in Russia's food market, which is an essential factor for the risk of emergence of a temporary imbalance between demand and supply, i.e. a shortage of certain food products and an increased risk of food inflation in Moscow. For instance, Moscow Oblast, which, by tradition, is a major supplier of milk and dairy products, meat and meat products, and vegetables, including potatoes, to the megalopolis, has demonstrated over time a steady trend of decline in food production. In the period 2000–2016, milk production was down by 30%, meat production – by 38%, and vegetable production – by 11% (Rosstat, 2017; Food security issues discussed in Moscow, 2012).

Discussion

For this and many other reasons, there is currently an objective need to develop a system for the city's food security that will help gain access to a sufficient, well-assorted group of safe food products. According to Moscow Department of Trade and Services, "the key components of food security include the analysis of the food market by reference to socio-economic indicators of people's standard of living, development of agro-logistics, development of goods distribution infrastructure, and organization of interregional and international cooperation in the food sector" (Moscow Mayor official website, n.d.). Given the issues stated above, it will hardly be possible to resolve this issue only by way of creating food reserves and storing them in available warehouses. In this regard, the Moscow Government is currently engaged in developing a new system for distribution of food resources, putting in place a more efficient agro-logistics infrastructure, putting together an integrated system for monitoring the market, laying a foundation for a set of activities on minimizing food security risks, and carrying out a set of activities aimed at providing targeted assistance to senior citizens and people with disabilities. Since 2014, there has been in successful operation an agri-food cluster named 'Food City' (Moscow Mayor official website, 2014).

Another key issue related to Moscow's food security is the need to regulate the requirements for the quality of food that is brought into the city and develop further the social and state quality control system. Regulating the

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requirements for the quality and safety of food products, especially within the social catering sector, ought to envisage the obligation to administer regular in-process monitoring of all stages in the technological process, which will be done by accredited labs (Poltarykhin & Suray, 2018; Voronkova & Iakimova, 2019; Bogoviz, 2018).

Food quality is a key criterion of food security. Therefore, there is a need to enhance standardization and the system of regulations aimed at providing Moscow residents with high-quality products and eliminating low-quality counterfeits. There is a need to introduce a regional standard for the quality and safety of food that is purchased via government contracts, including for the purpose of providing the population with targeted food assistance (Mikhailushkin & Novoselova, 2018; Nagimov, 2018; Korableva, 2018; Dibrova, 2018).

There are issues with the development of trade infrastructure, within the context of creating a state-of-the-art wholesale link that would help ensure guaranteed sales of and access to high-quality domestic products in Moscow's food market. Currently, the issue is minimal due to an enlargement of the retail and fair-based trade network. However, the priority is to dismiss the elements of monopolization and implement a system of social food assistance. Today, there is an objective need to work out a set of criteria and standards that would govern the development of trade infrastructure. Also, it is crucial to have in place varied-format infrastructural links of wholesale and retail trade. The government is expected to provide the city's existing clusters with varied-format sales outlets, like fairs, vending machines, mobile commerce, petty retail, convenience stores, minimarkets, supermarkets, hypermarkets, and large shopping malls. Today, Moscow has a retail floor-space capacity of 740 m2 per 1,000 people (Food security issues discussed in Moscow, 2012).

It stands to reason that, in developing government programs and investment projects in the city of Moscow, it may help to factor in activities on the development of trade infrastructure, the public catering sector, the procedure for arranging trade fairs, requirements for the planning and development of retail markets, buildings, and premises, requirements for nonstationary retail outlets, etc.

Of no less significance to resolving the issue of food security is analysis of the market for food products by reference to criteria such as people's standard of living and quality of life. The government of the city of Moscow is currently conducting work on putting together a calculation system for assessing and determining minimum allowed levels for the availability of key types of food within the city's distribution network. This integrated system for monitoring the state of food security in Moscow employs nearly 200 indicators (Asante, 2018; Mikhailushkin & Lubkova, 2018; Nechaev, Mikhailushkin & Alieva, 2018).

Conclusion

Thus, considering Moscow's existing conditions and current objectives on ensuring food security, a key parameter for resolving the issue is creating the conditions for meeting the needs of the city's residents by providing them with high-quality, safe, and affordable food products (Nechaev, Mikhailushkin & Presnyakov, 2018). The government is expected to focus on developing further the city's food distribution infrastructure and social catering sector, monitoring the state of the market and preparing projected balances on food reserves, creating the conditions for the entry of manufacturers of raw materials and finished products into the Moscow market and fostering competition, implementing large-scale projects and programs, and developing further the market information system. At present, the highest priority for future development is grounded in the pursuit of policy of import substitution on a broad range of food products required to sustain life. Meeting people's needs by providing them with domestically manufactured products objectively requires developing further the food market and creating additional jobs, with a focus on boosting the standard of living and quality of life of Moscow residents.

References

Akhmetshin, E. M., Dzhavatov, D. K., Sverdlikova, E. A., Sokolov, M. S., Avdeeva, O. A. and Yavkin, G. P. 2018. The influence of innovation on social and economic development of the Russian regions. *European Research Studies Journal*, 21(Special Issue 2): 767-776.

Asante, B., Villano, R., Patrick, I. and Battese, G. 2018. Determinants of farm diversification in integrated crop – livestock farming systems in Ghana. *Renewable Agriculture and Food Systems*, 33 (2): 131-149. http://doi.org/10.1017 / S1742170516000545

Barasheva, E. V. 2016. *Problemy prodovol'stvennoi bezopasnosti goroda Moskvy* [Issues of food security in the city of Moscow]. (in Russian). Retrieved from http://www.samoupravlenie.ru/50-03.php

Barcho, M., Nechaev, V. 2018. Investments and economic growth in poultry farming. *MATEC Web of Conferences.* Retreived from https://www.matec-conferences.org/articles/matecconf/abs/2018/71/matecconf_icre2018_07009/matecconf_icre2018_07009.html

Bogoviz, A. V., Osipov, V. S., Stroiteleva, T. G. (2018). Leading tools of state regulation of regional economy. *Advances in Intelligent Systems and Computing.* Springer Cham, ISBN 978-3-319-75382-9 http://doi.org/10.1007/978-3-319-75383-6_71

Deren, V. I. 2017. Prodovol'stvennaya bezopasnost' kak ekonomicheskaya kategoriya i faktor bezopasnosti gosudarstva [Food security as an economic category and a factor in the security of a state]. *Intellekt. Innovatsii. Investitsii*, 1*:* 23–27. (in Russian).

Dibrova, Z. N., Nosov, V. V., Ovchenkova, G. S., Karpenko, E. Z., Pilyugina, A. V. and Erkovich, E. A. 2018. The main directions of the solution of the problem of food security in Russia. *International Journal of Mechanical Engineering and Technology*, 9(12): 387-3947

Gamidullaeva, L. 2018. Towards Combining the Innovation Ecosystem Concept with Intermediary Approach to Regional Innovation Development. *International Journal of Economics & Business Administration*, 6(1): 39-53.

Glotko, A. V., Sycheva, I. N., Dunets, A. N., Makarov, A. N. and Anikienko, N. N. (2018). Development of the regional agriculture through the cluster approach in Russian Federation. *International Journal of Mechanical Engineering and Technology*, 9(11): 1156–1168, Article ID: IJMET_09_11_119 https://pdfs.semanticscholar.org/6e9d/a0f27ae141be6dec414d8d79421c0273638a.pdf

Korableva, O. N., Kalimullina, O. V., Zaytseva, A. A. and Larionov, A. I. 2018. Elaboration of database for the subject domain of innovation and economic growth potential. Paper presented at the Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020: 6065-6073.

Krivko, M., Smutka, L., Strielkowski, W. 2019. Food security and trade via lenses of sanctions. *Journal of Security and Sustainability Issues*, 8(4), 813-824. https://doi.org/10.9770/jssi.2019.8.4(22)

Kundius, V. A., & Poltarykhin, A. L. 2010. Model' prostranstvennoi organizatsii regional'nogo produktovogo klastera [A model for the spatial organization of a regional food cluster]. *Mezhdunarodnyi Sel'skokhozyaistvennyi Zhurnal*, 6*:* 45-47. (in Russian).

Mikhailushkin, P. V., Lubkova, E. M., Shilova, A. E., Karpenko, E. Z. and Nikiforov, S. A. 2018. Possibilities of agriculture competitiveness increasing. *International Journal of Mechanical Engineering and Technology*, 9(11): 1401-1412.

Mikhailushkin, P. V., Novoselova, N. N., Shulga, K. V., Kolpak, E. P. and Kabrits, S. A. 2018. Study of the forms and conditions of economic crises in the regional economies of developing countries. *Espacios*, 39(31): 26

Moscow Mayor official website. 2006. *Zakon goroda Moskvy ot 12.07.2006 № 39 "O prodovol'stvennoi bezopasnosti goroda Moskvy"* [Law of the City of Moscow No. 39 'On Food Security in the City of Moscow' of July 12, 2006]. (in Russian). Retrieved from https://www.mos.ru/dtu/documents/normativno-pravovye-akty/view/70379220/

Moscow Mayor official website. 2014, September 2. Sergei Sobyanin otkryl pervyi rossiiskii agroklaster [Sergei Sobyanin unveils Russia's first agri-cluster]. (in Russian). Retrieved from https://www.mos.ru/dpir/documents/arkhiv-novostei/view/113714220/

Moscow Mayor official website. n.d. Prodovol'stvennaya bezopasnost' [Food security]. (in Russian). Retrieved from https://www.mos.ru/dtu/function/deiatelnost/prodovolstvennaia-bezopasnost/

Nagimov, A. R., Akhmetshin, E. M., Slanov, V. P., Shpakova, R. N., Solomonov, M. P. and Il'yaschenko, D. P. 2018. Foresight technologies in the formation of a sustainable regional development strategy. *European Research Studies Journal*, 21 (2): 741-752.

Nechaev, V., Mikhailushkin, P., Alieva, A. 2018. Trends in demand on the organic food market in the European countries. *8 MATEC Web of Conferences.* Retreived from https://www.matec-conferences.org/articles/matecconf/pdf/2018/71/matecconf_icre2018_07008.pdf

Nechaev, V., Mikhailushkin, P., Presnyakov, D. 2018. Priorities of social and economic safety. *MATEC Web of Conferences.* Retrieved from https://www.matec-conferences.org/articles/matecconf/abs/2018/71/matecconf_icre2018_04015/matecconf_icre2018_04015.html

Poltarykhin A. L., Suray N. M., Zemskov Y. V., Abramov Y. V. and Glotko A. V. 2018. Food safety in the Russian Federation, its problems with the solutions. *Academy of Strategic Management Journal*, 17(4): 6.

Poltarykhin, A. L. 2015. Puti resheniya problemy prodovol'stvennoi bezopasnosti Rossiiskoi Federatsii [Ways to resolve the issue of food security in the Russian Federation]. In *Perspektivnye nauchnye issledovaniya i razrabotki v kooperativnom sektore ekonomiki: Materialy Mezhdunarodnoi nauchno-prakticheskoi konferentsii v ramkakh ezhegodnykh Chayanovskikh chtenii. V 2-kh chastyakh. Chast' 1* [Proceedings of Promising Research and Development within the Cooperative Sector of the Economy: International Research-to-Practice Conference Held as Part of the Annual Chayanovsky Readings. In 2 parts. Part 1]. Moscow, Russia: Kantsler, 34–41. (in Russian).

Poltarykhin, A. L., Ganieva, I. A., Churin, A. N., Melnikov, A. B., & Mikhaylushkin, P. V. 2017. Development of the meat market in Russia. *Espacios*, 38(48), 13.

Polyakova, A. G., Akhmetshin, E. M., Goloshchapova, L. V., Rakhmeeva, I. I., Noeva, E. E. and Rakovskiy, V. I. 2018. A model of regional economic space modernization. *European Research Studies Journal*, 21 (Special Issue 2): 624-634.

Rosstat. 2017. *Rossiya v tsifrakh. 2017: Kratkii statisticheskii sbornik* [Russia in figures. 2017: A concise statistics digest]. (in Russian). Retrieved from www.gks.ru/free_doc/doc_2017/rusfig/rus17.pdf

Shevkunova, E. S. 2014. Analiz urovnya potrebleniya produktov pitaniya [An analysis of food consumption levels]. *Politematicheskii Setevoi Elektronnyi Nauchnyi Zhurnal KubGAU*, 101*:* 480–495. (in Russian).

Sycheva, I. N., Ovchinnicov, Y. L., Voronkova, O. Y., Akhmetshin, E. M., Kolmakov, V. V. and Vasilieva, A. G. 2018. Economic potential and development prospects of small businesses in rural areas. *European Research Studies Journal*, 21(4): 292-303.

Ukaz Prezidenta RF ot 30 yanvarya 2010 g. N 120 "Ob utverzhdenii Doktriny prodovol'stvennoi bezopasnosti Rossiiskoi Federatsii" [Decree of the President of the Russian Federation No. 120 'On Signing into Law the Doctrine on Food Security in the Russian Federation' of January 30, 2010]. (in Russian). Retrieved from http://base.garant.ru/12172719/

V Moskve obsudili voprosy prodovol'stvennoi bezopasnosti [Food security issues discussed in Moscow]. (2012, June 21). (in Russian). Retrieved from http://www.regruss.ru/content/news/?ELEMENT_ID=1306&sphrase_id=4677

Voronkova, O. Y., Akhmetshin, E. M., Sycheva, I. N., Shpakova, R. N., Pashkova, E. Y. and Poltarykhin, A. L. 2018. Economic mechanism of regulating land relations in the agricultural sector of Russia. *European Research Studies Journal*, 21(4): 280-291.

Voronkova, O. Y., Iakimova, L. A., Frolova, I. I., Kamolov, S. G. and Prodanova, N. A. (2019). Sustainable development of territories based on the integrated use of industry, resource and environmental potential. *International Journal of Economics and Business Administration*, 2: 151-163.

Voronkova, O. Y., Sorokina, V. V., Baburin, S. V. (2019). The organizational-economic mechanism for the development of integration processes in the production and processing of products. *International Journal of Economics and Business Administration*, 7(*2*), 207-214. file:///C:/Users/Manuela/Downloads/The%20Organizational-Economic%20Mechanism%20for%20the%20Development%20of%20Integration%20Processes%20in%20the%20Production%20and%20Processing%20of%20Products.pdf

Vorotnikov, I.L., Sukhanova, I.F., Lyavina, M.Y., Glukhova, M.I., Petrov, K.A. (2019). Economic sanctions and import substitution. *Entrepreneurship and Sustainability Issues*, 6(4), 1872-1883. http://doi.org/10.9770/jesi.2019.6.4(23)

Ziuzya, E. V., Voronkova, O. Yu., Umirzakova, D. K., Qurbanov, P. A. and Kazakov, A. V. 2019. A methodological approach to assessing the efficiency of the economic mechanism for formation and development of intersectoral linkages. *International Journal of Civil Engineering and Technology*, 10(02): 920-925.

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MODERN CLUSTERS AND ASSESSMENT OF THEIR INNOVATIVE DEVELOPMENT

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Abstract. The goal of the research is to identify clusters' improvement areas in order to increase their innovativeness and to form a system of indicators for the quantitative characteristics of the proposed activities. Main results. The main directions for improving clusters in order to increase their innovativeness have been identified. The system of indicators characterizing these areas has also been proposed. Main conclusions. The use of the proposed directions and measures aimed at improving clusters and the recommended system of indicators for assessing their innovative development allowed proving a high level of innovation (using the example of the Russian titanium cluster).

Keywords: clusters; innovative development; directions and indicators for assessing clusters' innovativeness

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1. Introduction

At present, there is a rich theoretical and practical knowledge in using the territorial approach in various countries' economy (Marshall, 1983, p. 128; Porter, 2005, pp. 258-269). This allowed creating modern theories of territorial development and forming new types of industrial management including clusters.

Practically all modern industry in Denmark, Finland, Norway, Sweden and other coutries is based on clusters. For instance, 380 American clusters amounted to 60% of the country's GDP. In the EU countries, there are more than 2 thousand clusters which employ 38% of labor force (Davidenko, 2013, p. 180). One of the first, most successful and well-known clusters is Silicon Valley (the USA) that includes approximately 87 thousand companies, 40 research centers and 10 universities. It is served by 180 venture companies and 747 banks (Lenchuk, n.d.).

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The Research Institute of the Finnish Economy (ELTA) recorded 9 clusters which specialize in forest sector, metallurgy, mechanical engineering, construction engineering sector and telecommunications industry. Their activity allowed the country, in which 1% of the world's forest resources are concentrated, to provide 25% of paper exports and 10% of wood conversion products in the world (Oulu Region – The Direction for Expertise, 2003, p. 24). Italian clusters currently provide up to 30% of the country's industrial exports. There are more than 60 cluster zones in China, including 30 thousand firms with annual revenues of $ 200 billion and personnel of more than 3.5 million people. German chemical and engineering clusters, as well as French ones, that unite more than 60 thousand firms with more than 1 million employees, are actively involved in the EU clustering process (e.g. "Pegasus", a French aerospace cluster) (Abashkin, n.d.).

In the EU countries, much attention is paid to the implementation of cluster policy at various levels (local, regional, state and international). For that purpose, special organizations have been created in the EU to identify and disseminate positive clustering results.

The EU Cluster Research Commission manage a lot of work in this direction: a cluster platform (Cluster-IP) has been developed and is operating, a number of studies have been carried out, including the Cluster Policy in Europe (Oxford Research, Europe INNOVA Cluster Mapping Project and others). Thirty-one European countries and their cluster initiatives have been studied. This allowed identifying the structure, activities, terms and implementation mechanisms, sources of financing, as well as other patterns of the EU economy clustering process (Kutsenko, 2015).

The data on the cluster financing programs in Europe is presented in Figure 1. The conducted researches have shown that the main financial costs were carried out by state (national ministries) and interstate structures (the European Structural Fund), with business and regional structures' participation.

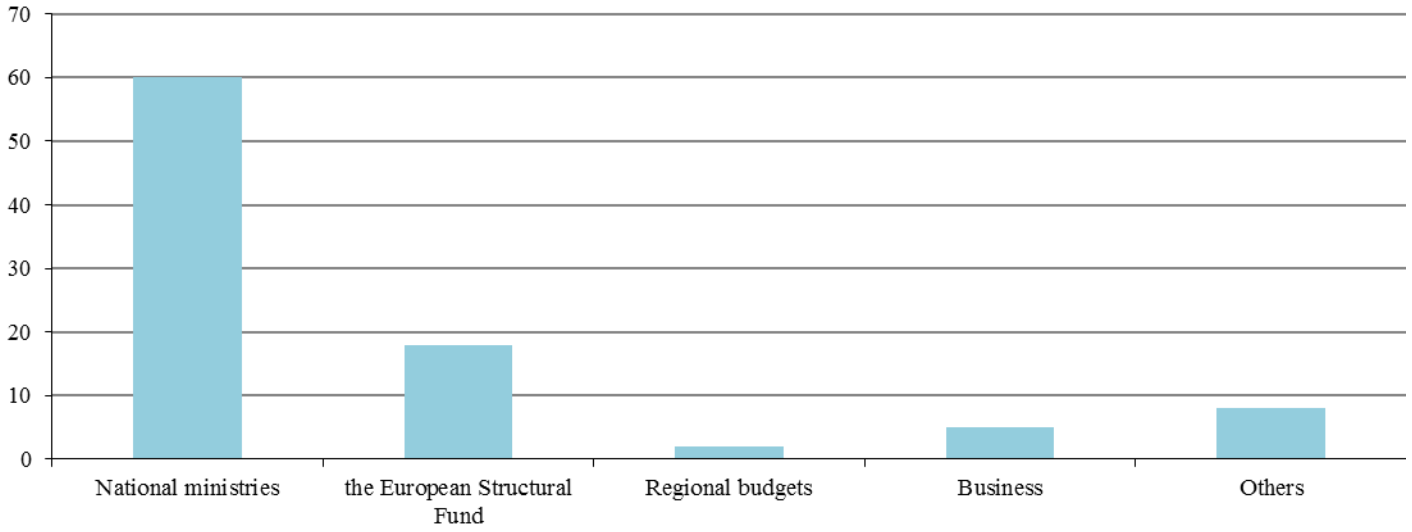

Figure 1. The financial structure of European cluster programs
Source: (Kutsenko, 2015).

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The process of clusters' creation was carried out most intensively since 2000. In particular 500 clusters were created in Europe, North America, New Zealand and Australia in 2003; there were already 1,400 clusters in 2005. During this period, the growth rate of clusters in the world exceeded 100% (Cluster policy: foreign experience, n.d.). The data of the European Cluster Observatory on clusters' development indicate that the maximum number of clusters was created from 2007 to 2010, e.g. 50 clusters were created in 2007 (Global Cluster Initiative Survey, 2012, p.8).

At present, it is noted that clusters in their development have gone through several stages, while their innovative orientation has steadily been increased. As a result, the most progressive cluster type has appeared – the regional innovation cluster (Regional-sectoral approach to assessing economic growth, n.d.; Rekord, 2012).

Modern clusters are considered to be an important element in the most countries' economic development. Cluster structures have great potential for practical development and implementation of innovations. Therefore, modern innovative development is impossible without examining the clusters' role in this process; in particular, the study of directions for clusters' improvement in order to increase their innovativeness is of considerable theoretical and practical interest (Tvaronavičienė, 2017; Razminienė, Tvaronavičienė, 2017; Monni et al., 2017; Jankowiak, 2018; Petrenko et al., 2019; Amraoui et al., 2019; Bublienė et al., 2019).

Thus, the problematics is that it is necessary to identify directions for improving clusters in order to increase their innovativeness and form a system of indicators to quantify recommended activities.

As the research hypothesis, it is proposed to use the most active and successful directions of clusters' development. As a result of the research it is necessary to identify a set of measures for their implementation in each direction. So a structured system of cluster development elements is formed, which allows increasing innovativeness and developing indicators for evaluating individual measures for the development of cluster's innovativeness.

2. Methods

It is noted that innovation activity of firms increases in clusters. The data on firms' innovation activities that depend on participation in clusters is presented in Figure 2 (based on examples of the EU countries).

The analysis of firms' innovation activities showed that companies that are within cluster structures are more innovatively active and successful compared to firms that are outside them because of:

- creation of new or improved products and services;
- creation of new or improved production capacity;
- market research of new products and services;
- triple helix use;
- international trademarks registration;
- application for patents.

Two main trends in modern cluster development are identified by researchers (Rekord, 2010, p. 35; European Commission, n.d.; Markkula, n.d.):

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– intersectoral interaction and cooperation of clusters at the regional and interregional level, which allow strengthening integration processes, expanding the range of products produced, increasing their readiness by creating new and developing existing added value chains;
– fuller use of geographical characteristics due to the EU concept of Smart Specialization.

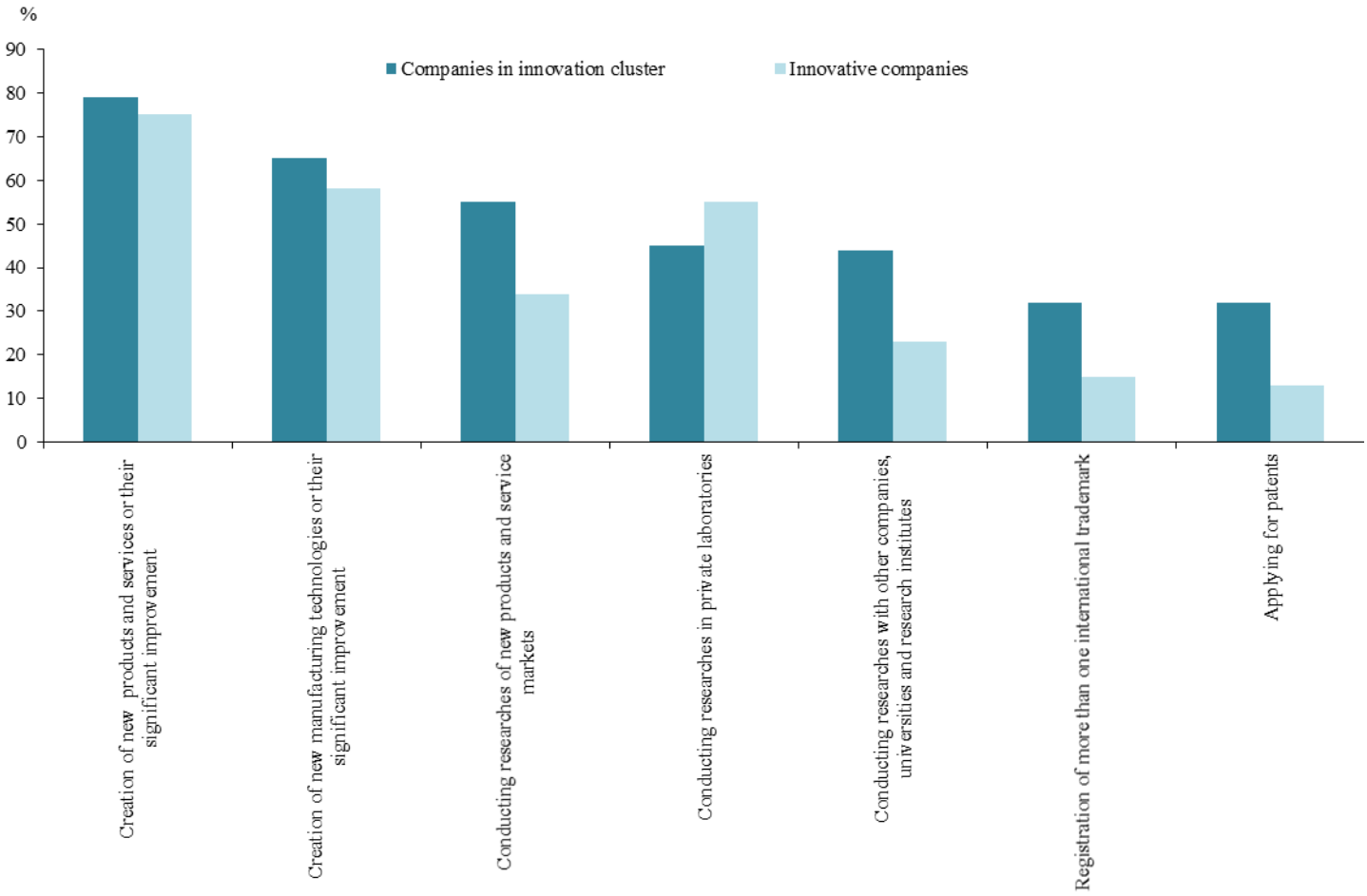

Figure 2. the comparison of firms' innovation activities within and outside cluster structures (for the EU countries)
Source: (Innovation and technology clusters of the countries - members of ICSTI, n.d., p. 16).

Smart Specialization concept provides structural changes in a region's activities as a result of the focus on unique industries or types of economic activity. Thus, regional innovation policy in a long-term period is ensured.

The combination of innovation and territorial development aspects in modern clusters can increase competitiveness of individual clusters, regions, and a country as well. The European Commission has determined that modernization of the EU industry should be based on Smart Specialization concept and interregional cooperation. The Smart Specialization Platform was recommended as a tool for implementing this strategy, on the basis of which it is proposed to coordinate clusters' functioning in regions (European Commission, n.d.).

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The EU experience in the European Cluster Improvement Initiative should be particularly noted. Since 2009 it has allowed analyzing clusters' states in the EU and developing recommendations for improvements. For this purpose the European Secretariat for Cluster Analysis was created, which assesses clusters and establishes their correspondence according to three levels (gold, silver and bronze management standards).

Developing countries and countries with economies in transition also participate in cluster programs (for example, the UNIDO Cluster and the Networking Development programs). Their initial goal is to fight poverty through industrial development as a result of selection and clusters' maintenance.

The comparison of clustering rates of the world's leading countries and Russia shows a lag of the Russian economy in this direction. The data presented at the World Economic Forum indicates that from 2008 to 2013 Italian, Finnish, American and German clusters were successfully developed in that period. While the indicators of China, Russia and Kazakhstan have deteriorated by 2013 and the ratings of Russia and Kazakhstan shifted from the 100th to the 120th place (Glukhova, 2012). In this connection serious measures were taken in Russia to accelerate clustering of the country's industry. In 2012 the implementation of the state program for creation and development of 25 pilot regional innovation clusters was launched.

Currently 11 out of 25 pilot Russian clusters specialize in new industries (information technologies, biopharmaceutics and new technologies), 14 clusters are formed on the basis of powerful existing industrial enterprises in the field of nuclear radiation technologies, aerospace and shipbuilding, chemistry and petrochemistry, etc, and also on the basis of small companies, often founded by these enterprises.

The regional structure analysis of the pilot clusters 'distribution showed that 71.4% of clusters are located in the regions which have large values of the Global Innovation Policy Index. This provided a high-quality innovation base for developing and implementing innovations and training personnel in clusters. In 2015 4 Russian clusters (Nuclear Innovation Cluster, Dimitrovgrad, Ulyanovsk Region; Kamsky Innovative Territorial and Production Cluster, Republic of Tatarstan; Innovative Territorial Cluster "Zelenograd", Moscow; Innovative Territorial Aerospace Cluster, Samara Region) received the EU Bronze Standard.

The innovative focus of state financial support for a pilot program, particularly in the form of subsidies to the innovation clusters' infrastructure, should be noted as well as advanced training and retraining of personnel and methodological, organizational, expert-analytical and informational support for clusters. The financing of these directions amounted to 65.8% of the total expenditures spent from the federal budget for the creation and development of pilot regional innovation clusters.

It is noted that a standard Russian cluster in general corresponds to a mature cluster (Ministry of Economic Development of the Russian Federation, n.d.). At the same time Russian clusters need further development and improvement. In particular, foreign experience shows that a competitive cluster should have in its composition (European Cluster Excellence Initiative, 2015):

- 90% of officially registered participants;
- 45% of commercial organizations working in the field of cluster's specialization;
- at least 20-15% of interacting participants;
- operation period of a management company must be at least 2 years.

Foreign experience confirms that for successful innovation diffusion, a cluster must have at least 30-50 specialized firms. The EU standards suggest that a modern innovation cluster should cooperate with universities

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and research centers. That is the triple helix model, a set of interactions between business, science and government.

The process of innovative development is constantly being improved: there is a change in methods and techniques of developing and commercializing innovative products, the number of people participating in innovative activities is also increasing (Novikova et al., 2016; Anisimov et al, 2017; Kiselev, 2015; Morkovkin et al., 2017; Nosova et al, 2018a; Nosova et al, 2018b; Nosova et al, 2018c).

To characterize the innovation rating of individual countries, the Global Innovation Index is currently used. In 2017 top 15 countries in this ranking are European countries, they lead at least in half of the indicators included in the index, which is formed from 84 indicators, including 57 input indicators characterizing a country's innovative potential and 27 output indicators describing an effective use of this potential. The methodology for studying this index is constantly changing and improving, i.e. new indicators are added to separate groups. The formation of these index indicators is based on both statistical and survey data. In this regard the definition of the Global Innovation Index is a rather complicated procedure.

Therefore, a system of indicators reflecting the main directions of improving innovative activities can be used to characterize the results of clusters' functioning.

The proposed directions for cluster improvement in order to increase innovativeness are shown in Figure 3:

- development of cluster's innovation infrastructure;
- increase in cluster's membership;
- development of educational infrastructure;
- management improvement.

The measures for each direction implementation have been identified.

The development of cluster's innovation infrastructure based on the triple helix concept provides:

- involvement of universities in cluster's research activities, on the basis of which research centers and other similar organizations are created (Oganisjana et al., 2017; Girdzijauskaite et al., 2019);
- creation and development of specialized innovation organizations like science parks, business incubators, engineering and other centers.

So, the interaction of business, science and government structures in the form of various development institutions created at the state level, and innovation structures that are actively being formed at the regional level are ensured.

The increase in cluster's membership is proposed to be implemented with:

- increasing a number of majors and commercial organizations operating in cluster's specialization field;
- fuller use of small business forms.

This approach ensures a maximum involvement of firms specializing in a particular field, rapid development and exchange of innovations between them, as well as a use of new forms of innovative interaction.

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The development of educational infrastructure allows improving employees' qualification and carrying out their retraining in order to ensure that qualification level of cluster personnel meets the requirements of innovative development.

Cluster management can be improved on the basis of creating a company managing a cluster, cluster's development centers and other structures that allow cluster participants to interact with each other to increase innovativeness (Novoselov et al., 2017; Sidorova et al., 2018). It should also be noted that territorial innovative clusters allow solving a problem of natural resource management (Kostygova, 2016; Kostygova, 2017; Kostygova, 2018).

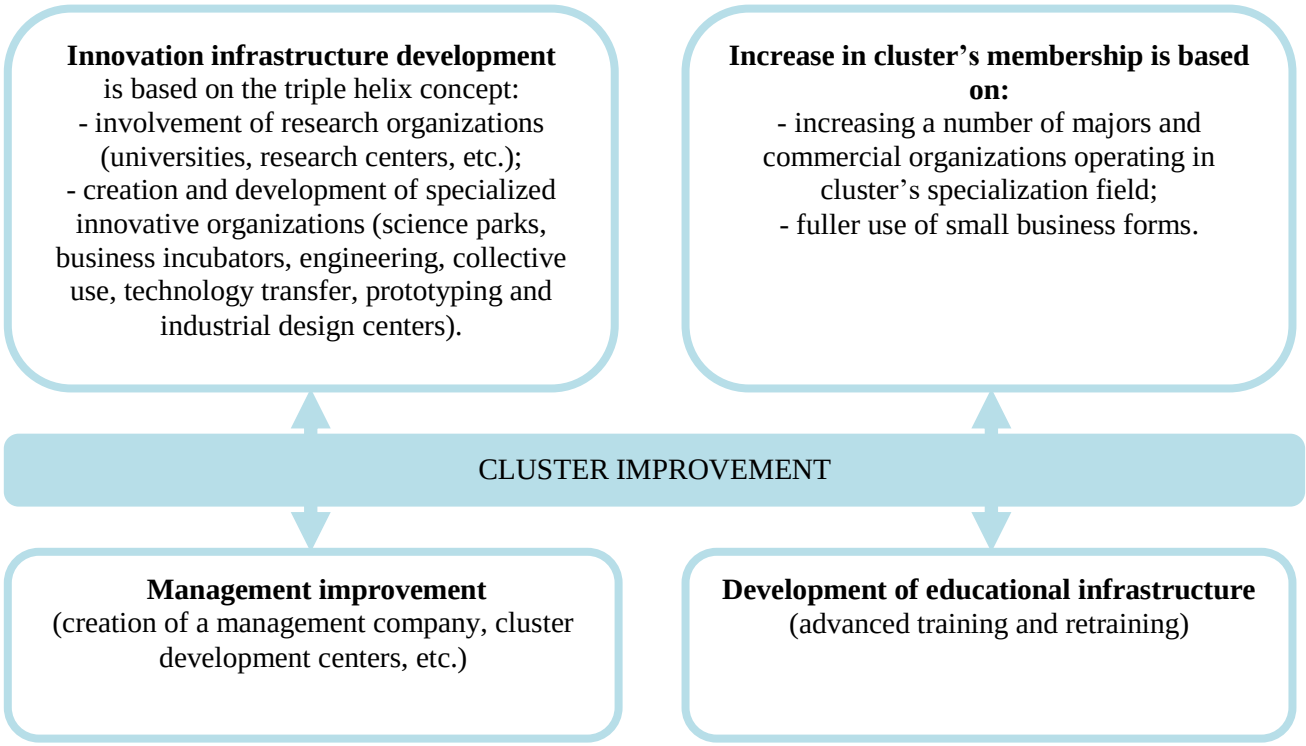

Figure 3. The system of measures to improve a cluster in order to increase innovativeness.
Source: Compiled by authors

The implementation of these directions should lead to an increase in the level of cluster's innovative activities. It is necessary that indicators reflecting this process focus on increasing innovative activity of cluster's members reflect the increase in innovative products output, products with higher value added, export and import-substituting products.

To assess the results obtained it is proposed to use the following system of indicators:

- the period from innovations' development to their implementation into production, years, months;
- the number of innovative organizations of regional, interregional and national level cooperating with a cluster, units;
- the share of cluster's members engaged in innovation activities in the total number of cluster's members,%;
- the availability of training and retraining personnel systems for cluster's members;
- the existence of a cluster management company, cluster development centers and other similar innovative structures;

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- the share of innovative products in the total cluster's output,%;
- the share of higher added value products in the total cluster's output,%;
- the share of export and import-substituting products in the total cluster's output,%.

3. Results

In The comparison of the indicators values determines the degree of increase in innovation development, both in a cluster and in individual directions of development. The characteristics of cluster's innovation activities using the example of the Russian titanium cluster's activity and its expected results are shown in Table 1.

Table 1. The characteristics of the cluster's innovation activity (based on examples of the Russian titanium cluster's activity and its expected results by 2024)

Indicator	Indicator value
Period from innovations' development to their implementation into production, years	1-3
Number of innovative organizations of regional, interregional and national level cooperating with a cluster, units;	10-15
Share of cluster's members engaged in innovation activities in the total number of cluster's members,%;	at least 55
Availability of training and retraining personnel systems for cluster's members;	+
Existence of: - a cluster management company - cluster development centers	 + +
Share of innovative products in the total cluster's output,%;	up to 70
Share of higher added value products in the total cluster's output,%;	up to 70
Share of export products in the total cluster's output,%.	60 - 70

Source: Compiled by authors

4. Discussion

Using the proposed system of measures to improve clusters' innovativeness allowed forming the system of indicators to assess innovativeness. In contrast to international experience, based on the use of the Global Innovation Index to characterize the innovation rating of individual countries, the approach recommended by the authors allows us to assess the innovative development level of a particular cluster in individual directions and activities. The recommended system of measures and indicators allows deepening, specifying and evaluating individual measures for the cluster's innovative development. As shown by the study performed, according to the proposed methodology the results obtained for the Russian titanium cluster provide a detailed assessment of innovativeness. As a result the level and directions of further innovative development of a specific cluster were determined.

According to the data presented in Table 1, it follows that the Russian titanium cluster should correspond to the level of a mature cluster by 2024, providing the share of innovative higher added value products in the total cluster's output at the level of 70 %. It is also assumed that the share of export products will be 60-70%. The cluster already has a management company and a number of cluster development centers. A system of personnel training and retraining has been implemented and it will be developed. The cluster is expected to cooperate with at least 15 innovative organizations at the regional, interregional and national levels (development institutions of Sverdlovsk region, the Skolkovo Center for Development and Commercialization of New Technologies, the

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Technology Platform "Technologies in Metallurgy and Advanced Materials", etc.). The share of cluster's members engaged in innovation activities in the total number of cluster's members (at least 55%) should be significantly increased. The results show that Russian clusters can achieve a high level of innovation activity that will reduce the period from development to implementation into production up to 1 year.

Conclusions

As a result of the study, the following results were obtained:

1. Currently clusters are an integral part of modern economic development of most countries. A modern cluster has a significant potential. An important task was solved in the work, i.e. measures to improve a cluster were systematized in order to increase innovativeness. On this basis, the system of indicators for the quantitative assessment of individual directions of cluster's innovation development has been proposed. These directions include:

- development of cluster's innovation infrastructure;
- increase in cluster's membership;
- development of educational infrastructure;
- management improvement.

2. Moreover for each recommended directions a set of measures necessary for their implementation was proposed. To assess the results obtained in the work, a system of cluster's development indicators was proposed:

- the period from innovations' development to their implementation into production, years;
- the number of innovative organizations of regional, interregional and national level cooperating with a cluster, units;
- the share of cluster's members engaged in innovation activities in the total number of cluster's members,%;
- the availability of training and retraining personnel systems for cluster's members;
- the existence of a cluster management company, cluster development centers and other similar innovative structures;
- the share of innovative products in the total cluster's output,%;
- the share of higher added value products in the total cluster's output,%;
- the share of export and import-substituting products in the total cluster's output,%.

3. The significance of the obtained results lies in development and concretization of methodological guidelines for the study and measures evaluation to increase clusters' innovativeness. Using the example of the Russian innovation titanium cluster, separate directions of its development are evaluated and a possibility of achieving a high level of innovation by Russian clusters is also proved.

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http://doi.org/10.9770/jesi.2019.7.1(42)

References

Abashkin, V. Francuzskie uroki dlja pilotnyh klasterov v Rossii [French lessons for pilot clusters in Russia]. Retrieved June 17, 2018 from: http://issek.hse.ru/news/141026538html

Amraoui, B., Ouhajjou, A., Monni, S., El Amrani El Idrissi, N., Tvaronavičienė, M. 2019. Performance of clusters in Morocco in the shifting economic and industrial reforms, *Insights into Regional Development*, 1(3): 227-243. https://doi.org/10.9770/ird.2019.1.3(4)

Anisimov, A., Polozhentseva, Y., Zhaglovskaya, A., Aleksakhin, A., 2017. Regional monitoring of staffing support in the coal mining industry. *Eurasian Mining*, 2: 53-56.

Bublienė, R., Vinogradova, I., Tvaronavičienė, M., Monni, S. 2019. Legal form determination for the development of clusters' activities, *Insights into Regional Development*, 1(3): 244-258. https://doi.org/10.9770/ird.2019.1.3(5)

Davidenko, E. 2013. Klasterizacija kak instrument realizaciikonkurentnyh preimushhestv stran na mirovom rynke [Clustering as a tool for the implementation of competitive advantages of countries in the world market]. *Jekonomicheskie nauki [Economic sciences]*, 4 (101):179–182. (in Russian)

European Cluster Excellence Initiative. 2015. The quality label for cluster organisations — criteria, processes, framework of implementation. Retrieved February 8, 2015. Available at: http://www.cluster-excellence.eu

European Commission. N.D. Available at: https://ec.europa.eu/growth/industry/innovation_en

Fattakhov, R.V., Stroev, P.V., Nizamutdinov, M.M. 2018. Modeling of urban resettlement in Russia: trends and prospects. *Financial and Economic Tools Used in the World Hospitality Industry Proceedings of the 5th International Conference on Management and Technology in Knowledge, Service, Tourism and Hospitality*: 97 – 102.

Girdzijauskaite, E., Radzeviciene, A., Jakubavicius, A. 2019. Impact of international branch campus KPIs on the university competitiveness: FARE method, *Insights into Regional Development*, 1(2): 171-180. https://doi.org/10.9770/ird.2019.1.2(7)

Global Cluster Initiative Survey 2012. Survey Summary Report. *European Commission, European Cluster Observatory. Stockholm*: 8 – 9.

Glukhova, M. 2012. Klastery – nuzhny li oni rossijskoj jekonomike? [Clusters - Do They Need the Russian Economy?] Promyshlennik Rossii [Russian Industrialist]. Available at: http://www.promros.ru/magazine/2012/oct/mariya-gluhovaklastery-nuzhny-li-oni-rossijskoj-ekonomike.phtml

Innovacionno-tehnologicheskie klastery stran – chlenov MCNTI (Innovation and technology clusters of the countries - members of ICSTI) 2013. Available at: http://www.icsti.su/uploaded/201304/cluster.pdf

Jankowiak, A.H. 2018. Cluster Policy Models in the VISEGRAD Group Countries - A Comparative Study, Transformations in Business & Economics, 17, (2A) (44A): 447-465

Kiselev, B.G. 2015. Innovation development strategy of industrial enterprise (on example of refineries). *Tsvetnye Metally*, 7: 24 – 28

Klasternaja politika: zarubezhnyj opyt (Cluster policy: foreign experience). 2014. *Strategy Journal*. Available at: http://strategyjournal.ru/news/promyshlennost/klasternaya-politika-zarubezhnyj-opyt/

Kostygova, L. 2016. Natural resource management in a territorial innovation cluster, *16th international multidisciplinary scientific geoconference SGEM 2016, Ecology, economics, education and legislation conference proceedings, VOLUME III, 30 June – 6 july, 2016 Albena, Bulgaria*: 381-388

Kostygova, L. 2017. Ration consumption of natural resources based on additive technologies in the titanium production, *17th international multidisciplinary scientific geoconference SGEM 2017, Ecology, Economics, Education and Legislation ISSUE 5.329, June – 5 july, 2017 Albena, Bulgaria*: 695-699

Kostygova, L. 2018. Prospects for implementing a circular economy in industry based on territorial innovative clusters, *18th international multidisciplinary scientific geoconference SGEM 2018, Ecology, Economics, Education and Legislation ISSUE 5.3, 29, 2 July – 8 July, 2018 Albena, Bulgaria*: 631-638

Kutsenko, E. 2015. Pilotnye innovacionnye territorial'nye klastery Rossii: model' ustojchivogo razvitija [Pilot innovative territorial clusters of Russia: a model of sustainable development]. *Foresight,* 1. Retrieved February 6, 2018 from: https://foresight-journal.hse.ru

Lenchuk, E. Klasternyj podhod v strategii innovacionnogo razvitija Rossii [Cluster approach to the strategy of Russian innovative development]. Jekonomicheskij portal [Economic portal]. Retrieved October 10, 2018 from: http://institutiones.com/strategies1979-klasternyj-podxod-v-...html

Markkula M. Making smart regions smarter: smart specialization and the role of universities in regional innovation ecosystems. Retrieved June 10, 2018 from: www.elexpro.ru/932.php

Marshall A. 1983. *Principy politicheskoj jekonomii* [Principles of political economy]. Moscow, Progress Publ.

Ministry of Economic Development of the Russian Federation. Implementation of cluster policy in the Russian Federation. Retrieved January 15, 2018 from: http://www.slideshare.net/semenvuymenkov/ss-48825963

Monni, S., Palumbo, F., Tvaronavičienė, M. 2017. Cluster performance: an attempt to evaluate the Lithuanian case. *Entrepreneurship and Sustainability Issues*, 5(1): 43-57. http://doi.org/10.9770/jesi.2017.5.1(4)

Morkovkin, D., Shmanev, S., Shmaneva, L. 2017. Problems and Trends in Innovative Transformation of Russian Economy and Infrastructure Development. *Advances in Economics, Business and Management Research, volume 32. 3rd International Conference on Economics, Management, Law and Education (EMLE 2017*). Atlantis Press: 25-35.

Nosova, S.S, Makar, S.V., Chaplyuk, V. Z., Medvedeva, A. M., Semenova, A., N. 2018c. Collaborative Nature of Innovative Economy Naturaleza colaborativa de la economía innovadora. *Espacios*, 39(41): 32-41.

Nosova, S.S, Norkina, A.N., Makar, S.V., Arakelova, I.V., Medvedeva, A. M., Chaplyuk, V. Z. 2018b. The digital economy as a new paradigm for overcoming turbulence in the modern economy of Russia. *Espacios*, 39(24): 27.

Nosova, S.S., Meshkov, S.A., Meshkova, G.V., Stroev, P.V., Boyar-Sozonovitch, A.S. 2018a. Digital technologies as a new vector in the growth of innovativeness and competitiveness of industrial enterprises. *International Journal of Civil Engineering and Technology*, 9(6):1411-1422.

Novikova, N., Barmuta, K., Kaderova, V., Il'Yaschenko, D., Abdulov, R., Aleksakhin, A. 2016. Planning of new products technological mastering and its influence on economic indicators of companies. *International Journal of Economics and Financial Issues*, 6(8S): 65 – 70.

Novoselov, S.N., Larina, S.V., Klimovskikh, N.V., Gorlova, E.A., Aleksakhina, Y.V., Shedko, Y.N. 2017. Becoming and Growth of Cluster Management in the Regional Economy of Russia. *International Journal of Applied Business and Economic Research*, 15(12): 93–101

Oganisjana, K., Svirina, A., Surikova, S.; Grīnberga-Zālīte, G., Kozlovskis. K. 2017. Engaging universities in social innovation research for understanding sustainability issues. *Entrepreneurship and Sustainability Issues*, 5(1): 9-22. http://doi.org/10.9770/jesi.2017.5.1(1)

Petrenko, Y.; Vechkinzova, E.; Antonov, V. 2019. Transition from the industrial clusters to the smart specialization of the regions in Kazakhstan, *Insights into Regional Development,* 1(2): 118-128. https://doi.org/10.9770/ird.2019.1.2(3)

Porter, M. 2005. *Konkurencija [Competition]*. Moscow, Williams Pabl.

Razminienė, K., Tvaronavičienė, M. 2017. Economic globalization and its impacts on clustering, *Terra Economicus*, 15 (2): 109-121 http://doi.org/10.23683/2073-6606-2017-15-2-109-121clustering.html

Regional'no-otraslevoj podhod k ocenke jekonomicheskogo rosta (Regional-sectoral approach to assessing economic growth). *Market journal.* Available at: http://www.market-journal.com/problemieco/11.html

Rekord, S. 2010. *Razvitie promyshlenno-innovacionnyh klasterov v Evrope: jevoljucija i sovremennaja diskussija [The development of industrial innovation clusters in Europe: the evolution and modern discussion]*. St. Peterburg, St. Petersburg State University of Economics and Finance Publ.

Rekord, S. 2012. Razvitie promyshlenno-innovacionnyh klasterov v kontekste jevoljucionnoj jekonomiki [The development of industrial innovation clusters in the context of an evolutionary economy]. *Vestnik Rossijskoj akademii estestvennyh nauk [Bulletin of the Russian Academy of Natural Sciences]*, 2: 34–37.

Sidorova, E., Muradov, I. 2018. Formation of an effective corporate governance system for industrial interprises, *17th international multidisciplinary scientific geoconference SGEM 2018, Ecology, Economics, Education and Legislation ISSUE 5.3, 2 July – 8 July, 2018 Albena, Bulgaria:* 407-414.

Tvaronavičienė, M., Razminienė K. 2017. Towards competitive regional development through clusters: approaches to their performance evaluation. *Journal of Competitiveness*, 9(4): 133-147, https://doi.org/10.7441/joc.2017.04.09

Tvaronavičienė, M. 2017. Clusters, innovations and energy efficiency: if relantionship could be traced. Marketing and *Management of Innovations*, 2: 382–391. http://doi.org/10.21272/mmi.2017.2-35

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MODELS OF CREDIT LIMIT-SETTING FOR COMPANIES AS MEANS OF ENCOURAGING COMPETITIVENESS*

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Abstract. Monetary policy deals with a number of issues including improvement of the national business competitiveness, increasing the volume of internal credits, ensuring stability and sufficient reinvestments into the real sector of the economy. On the one hand, banks issue credits relying on the index of competitiveness. On the other hand, banks should encourage the growth of the organization's competitiveness. These tasks are interconnected, but the latter one is hardly considered by researchers. Administration of companies' competitiveness is a set of financial methods aimed at modifying the activity of regulatory institutions so that they can help companies achieve the required financial criteria. In order to solve the trilemma of competitiveness, monetary policy and credit limit-setting for a group of companies, robust management is necessary. Currently, banks have sufficient liquidity but prefer low credit exposure. Such an approach is conditioned by the recent financial shocks, dissatisfaction and disappointment with the existing methodology, which has not protected banks from risks. It leads to the necessity for banks to introduce credit limits for each company. The authors suggest a model of adjustment of competitiveness drivers for the real sector of the economy and ways to determine credit limits in order to support competitiveness.

Keywords: monetary policy; transmission mechanism; transmission investment channel; competitiveness; general equilibrium model; structured product

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1. Introduction

The mechanism of interaction between monetary policy and competitiveness of companies is one of the foundations of the economic system. It ensures the interrelated dynamics of monetary policy indicators and corporate financial performance, which determines the competitiveness of companies. This mechanism should be established in such a way that, on the one hand, banks are able to issue credits to a particular company relying on its competitive performance. On the other hand, banks should encourage improvement of a company's performance. These tasks are interconnected. Competitiveness is additive information as far as the transmission mechanism is concerned; it can influence the connections of the monetary system and reflect the hierarchy levels of the users' financial mechanisms.

The next dilemma is the definition of competitiveness. Presently, there is no unequivocal interpretation of this notion; it usually implies any created advantage, such as:

1) expanding the market share at the expense of competitors;
2) operational efficiency;
3) complex of elements providing growth of productivity, technological effectiveness, efficient use of resources etc.

In this regard another dilemma arises: one the one hand, a unified approach is necessary; on the other hand, one cannot ignore the specific features of different sectors of the economy.

2. Literature review

The main aspects of lending to companies, risk management, assessment of limits, competitiveness and guarantees for credit institutions, have been studied by a number of foreign scientists, such as Bauerschmidt, P.A, Studnitzer, A.L, Albert, W.J, Callaway, P.J, Farrell, J.W, & Thiruthuvadoss, A.S (2010), Delis M.D (2012), Aven, T., & Renn, O. (2010), Sutton. I (2014), Rutkauskas, A.V, & Stasytytė, V. (2010), Thomas, J.B., & McDaniel Jr, R. R. (2017), Thomas, J.B., McDaniel Jr, R.R. (2017), Ashmos, D. P., Duchon, D., & McDaniel Jr., R.R. (2007), Tvaronavičienė, M., Masood, O., Javaria, K. (20180, etc.

For example, Bauerschmidt, P. A., et al. (2010) are exploring methods that allow anonymous transactions, which are a centralized element of the credit risk management mechanism.

Delis, M. D. (2012) assesses the degree of market power at the banking level for 84 banking systems around the world and analyzes the sources of banking competition, focusing on the effectiveness of institutional financial reform. The author believes that the policy of financial liberalization reduces the market power of banks, but a certain level of institutional development is a prerequisite for the success of reforms aimed at improving the efficiency of banking markets on the basis of competition in the non-financial sector.

Aven, T., & Renn, O. (2010) concentrate on a combined credit limit and social risk perception.

Sutton I. (2014) wrote that an effective credit policy program wss often based on foggy topics such as competitiveness and a company's reputation.

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Rutkauskas, A. V., Stasytytė, V. (2010) wrote that the concepts of competitiveness, risk and guarantees were the three cornerstones of ensuring the safety of investors and lenders.

Thomas, J.B. and McDaniel Jr., R.R. (2017) emphasize the crucial role of the competitiveness of industrial companies in finding investors and lending technologies. They assess how managers interpret a company's competitiveness for understanding strategic actions, organizational change, and learning. In their study, 151 managers were interviewed to study how the same situation is interpreted from the perspective of factors of competitiveness and risk.

Ashmos, D.P., Duchon, D., McDaniel Jr, R.R. (2000, 2007) assess the guarantees and lending limits created as a manifestation of organizational spirituality and culture.

3. Problem statement

In the course of determining their regulatory and economic capital (used to neutralize risks), credit organizations currently use both unified methods of quantitative and specific risk assessment in accordance with Basel III. This is caused by the necessity to take into account the heterogeneity of borrowers: industrial, sector-wise, segmental and social. Thus, it is definitely worth using ad-hoc elements for planning, particularly when it comes to planning a credit portfolio. The standard approach to competitiveness assessment can be based on official statistics collected by information agencies, as well as financial statements of borrowing companies. Table 1 shows an example of official assessment of the global competitiveness of a representative company from the chemicals and petrochemicals economy sector.

Table 1. Akron PAO | 2018, Thomson Reuters Global Index - Market Cap filter: Top 25, Report: Summary, Currency: RUB

Name	Last	PE	Est. PE	EPS	DPS	Div. Yld (%)	ROE (%)	P/Book	P/Sales	Weight %	Mcap
Akron PAO	4,251.00	6.16	10.23	696.93	597	13.91	36.52	2.59	1.95	0	173,700,470,643.61
Index average (Mean)	--	52.75	23.94	75,643.75	317.13	2.79	14.77	4.9	4.79	0.52	24,078,176,585,480.80
Index median	--	21.52	16.04	249.32	104.85	2.14	12.48	1.88	3.37	0.48	18,686,506,212,866.60

Source: Compiled by authors

Overvaluation of securities has been typical for companies from this sector of the economy for a long time. Chemicals and chemical fertilizers sector has an inverse correlation with the oil and gas sector. However, a change in trend can be noticed nowadays, which is reflected in Figure 1. Overvaluation of the companies' shares is connected with a lengthy period of stock prices growth, high expectations of dividend payment, positive reports in the prior periods (in terms of profitability). China has resumed export of fertilizers, and other companies started offering high dividends, quarterly disbursements, and lower leverage. Therefore, since June 2017 Akron PAO's shares were continuously rising in price by more than 50% in dollar terms (Table 1 and Figure 1), but recently, there have been changes in this trend. Since the beginning of 2018 shares of Akron PAO have risen only by 10%, and the remaining return this year amounts to 4%.

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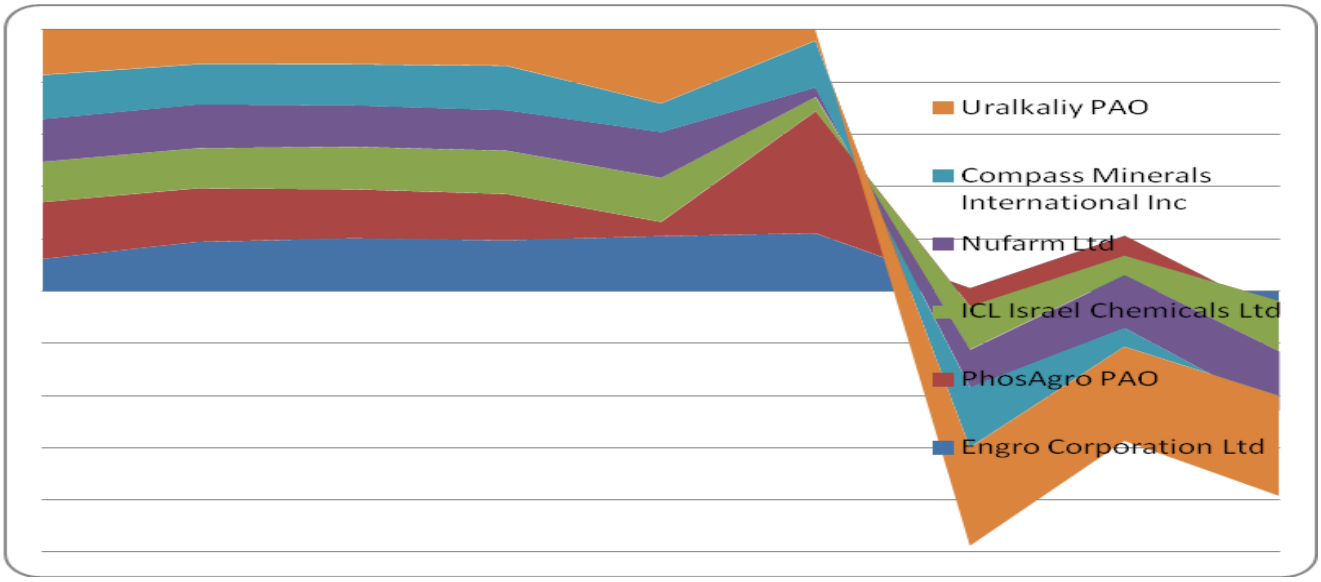

Fig.1. Index Competitors: Thomson Reuters Global Agricultural Chemicals Index — Cap filter: Top 25, Report: Relative Strength
Source: Compiled by authors

Currently, in many countries, the most effective sector is a closed monopoly, i.e. organizations that get overprotection from the government, such as affordable credits, interest subsidies, and budget co-financing. As a rule, such situation is typical for strategic industries. In Russia and China, these are agricultural, pharmaceutical, space and defense industries. However, strategic industries are heterogenic, since the distribution of productive power is usually ministerial.

Currently, banks have sufficient liquidity (for example, in China, Russia, former Yugoslavian countries and the Czech Republic, there is non-earning excess liquidity), but they still prefer to maintain low credit exposure. Nowadays the sensitive point for oil and gas companies is the lack of working capital and investments. This situation calls for the necessity to introduce credit limits for banks, which would determine the size of credit they cannot refuse. Such sentiment in the banking sector is caused by the recent financial shocks, dissatisfaction with the methodology of the Basel Committee, and the failure of the "economic capital" instrument. These processes have stimulated banks to develop their own models of risk management and calculation of economic capital. Due to this banking regulators in many countries monitor the dynamics and structure of banking operations in order to adjust the work of the banking sector. As one can see in Table 2, companies from this sector of economy use credit debt in their work with counterparties very efficiently, and even the reduction of sales profits in 2016 (of course, together with the reduction of credit debt) has not affected the profitability ratio. Such performance justifies the introduction of the credit limit.

Table 2. Performance figures characterizing credit debt. Source: Thomson Reuters

Performance indicators	2015	2016	2017
Credit debt profitability ratio (based on sales profits), %	635.54%	964.24%	1,016.68%
Credit debt profitability ratio (based on net profit), %	86.89%	261.70%	603.34%

Source: Compiled by authors

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Similar crediting guidelines at the macro-level were determined by Wicksell (2010) and Leontiev (1985). Evidently, the time has come to develop such guidelines for the meso-level as well. Management of competitiveness is of robust nature.

Administration of companies' competitiveness is a set of financial methods aimed at modifying the activity of regulatory institutions so that they can help companies achieve the required solvency and credit worthiness. If the object of financing and its characteristics are different from the reference model or not all of the monitored parameters are available, robust management is exercised. One of the goals of pursued by improvement of credit risk models set by Basel III is the introduction of predictive reservation model based on discounting of expected losses instead of the current approach based on incurred losses. It means that preference is given to transactions with future capital instead of current capital discounting, which implies a change of the financial policy. These requirements can be seen as a common approach to measuring all risks faced by the bank. Table 3 represents the competitiveness analysis of oil and gas companies. The analysis suggests that the market is concentrated, but the trend is descending

Table 3. Results of the competitiveness analysis

Classification by C* and MS*		Classification by MS			
		Leaders	High C*	Low C*	Outsiders
		20.58—30.10	10.00—20.58	2.95—10.00	1.36—2.95
Quickly improving C*	103.88—112.39	Sibur			
Improving C*	122.86—103.88			Akron PAO	
Declining C*	84.92—122.86	EvroHim	PhosAgro PAO	KuibyshevAzot, Nevinnomysskiy Azot	Dorogobuzh, Shchekinoazot
Quickly declining C*	72.64—84.92		Uralkaliy PAO	TOAZ	

References: C — competitiveness; MS — market share.*
Source: Compiled by authors

4. Methods

The authors use the dynamic stochastic general equilibrium model (DSGE) as the main instrument of analysis. This model was chosen due to its advantages described by Guerron-Quintana, P., A. Inoue & L. Kilian (2012), Christiano, L., Devis, R., Rostano, M.(2012), Kerk, L., Phillips, K. (2017) and Del Negro, Schorfheide, Smets & Wouters (2007):

- ✓ More accurate results;
- ✓ Introduction of specified utility functions advantageous for borrowing agents, which allows considering the effects of different types of macroeconomic interference into the agents' welfare;
- ✓ The advantage of choosing the prediction time lag.

As a rule, in order to analyze the processes in monetary policy, researchers use the classical minimum distance method. Examples of using this model, particularly impulse response function, can be found in the articles by Boivin & Giannoni (2006), Christiano, Eichenbaum & Evans (2005) and Schorfheide, F. (2010).

The novelty of the approach suggested in this article involves the balanced use of the portfolio theory by H. Markowitz, his T-portfolio and Tobin's Q theory. The latter reflects the possibility of changing the investment decisions made by the company. The model used for determining the minimum compulsory amount of credit to be issued is based on the balance between the bank exposure and the company's competitiveness. The guarantee

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of general equilibrium for the bank should be created by analogy with structured products, which include different types of bonds, shares, and options allowing to change the level of assurance both for the creditor and the borrower. Since assets belonging both to the bank and the borrower have a multi-layer structure, the choice of the optimal credit portfolio is made with the use of iterative techniques. In order to calculate the amount of the bank's economic capital and work out the distribution of credit exposure it is required to do the following:

- Determine the risk factors and their connection with profit components;
- Choose the methods of prediction and use ad-hoc elements for each risk factor and profitability of banking operations;
- Determine stochastic models, which reflect possible deviations of risk factors from their average predicted values.

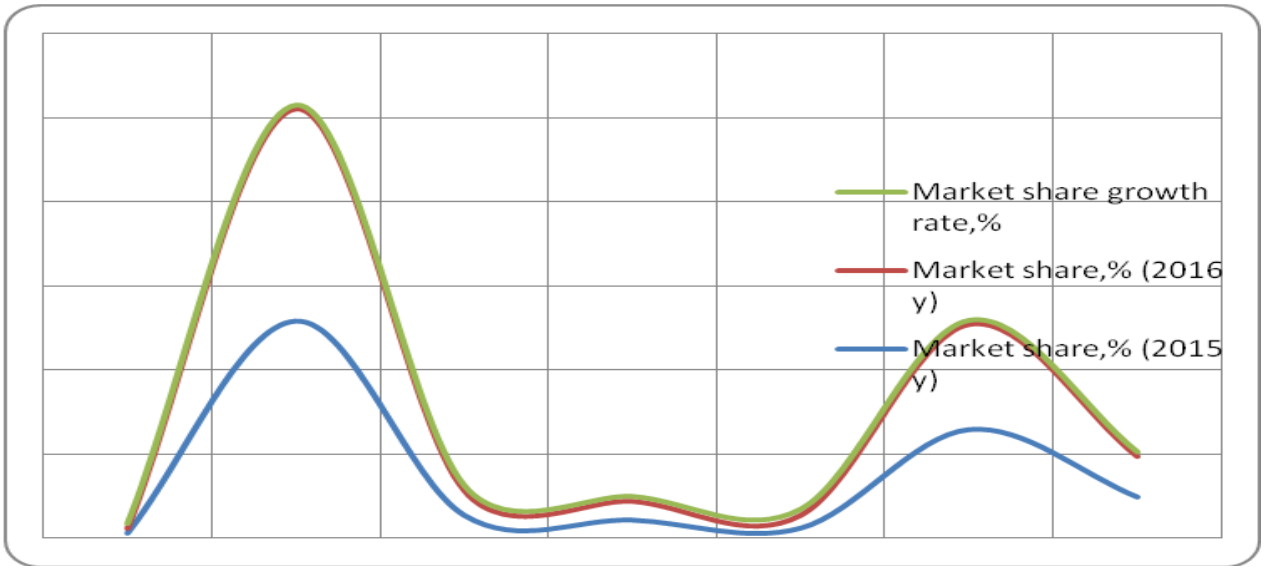

Figure 2. Banking segment, market growth and concentration parameters: Thomson Reuters: Top 25, Report
Source: Compiled by authors

Table 4 shows the main characteristics of banks' competitiveness which are used for calculating economic capital at different management levels, while Figure 2 shows dynamic characteristics of the banking business.

Table 4. Index Competitors: Thomson Reuters Global Banking Segment Index — Cap filter: Top 25, Report: Relative Strength

Name	Last	PE	Est. PE	EPS	DPS	Div. Yld (%)	ROE (%)	P/Book	P/Sales
Bank Sankt-Peterburg PAO	57.45	5.91	4.18	9.76	1.05	1.82	--	0.48	0.83
Index average (Mean)	--	14.67	7.90	17.49	10.10	2.79	13.47	1.35	4.07
Index median	--	10.31	6.00	17.12	6.00	2.39	11.68	1.15	3.07
…	…	…	…	…	…	…	…	…	…
Sberbank Rossii PAO	259.36	10.31	7.36	25.05	6.00	2.32	--	2.05	3.37

Source: Compiled by authors

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The distribution based on the available statistics was executed with the help of Thomson Reuters functionality. Arguably, in many countries, there is still an acute shortage of credit funds. However, the controversial nature of credit limits, both for the economy and banks, is obvious. First of all, it is important to plan distribution for first level portfolios. In order to calculate the credit limit based on competitiveness, one should determine the model using system (1).

$$Rrisk = -\Delta ROA_t * A_t - ROA_t * \Delta A_t = \frac{\Delta ROA_t}{ROA^t} * Profit_t - \frac{\Delta A^t}{A_t} * Profit_t$$

$$BRisk = \frac{\Delta A^t}{A_t} * \mathrm{P}\mathbf{r}ofitt^t$$

$$-\Delta ROA^t * A^t = -(\Delta DCP^t - \Delta NR^t) * CP^t - \Delta DFP^t * FP + \Delta SP^t * P^t - \Delta DV^t * OVP^t - \Delta NOD^t * A^t + \Delta Ex^t * A^t (1) \quad (1),$$

$$KRisk = \Delta NR^t * CP^t = \frac{\Delta NR^t}{NR^t} * NR^t * CP^t = \frac{\Delta NR^t}{NR^t} * ReZ^t$$

$$LTC = NCA + PCA + sVCA \text{ or } CL = iVCA \text{ or } NWC = PCA + gVCA$$

$$C^* = aFP + \beta SP + \gamma FS + \delta CG$$

$$KRisk = \Delta NR^t * CP^t = \frac{\Delta NR^t}{NR^t} * NR^t * CP^t = \frac{\Delta NR^t}{NR^t} * ReZ^t$$

$$LTC = NCA + PCA + sVCA \text{ or } CL = iVCA \text{ or } NWC = PCA + gVCA$$

$$C^* = aFP + \beta SP + \gamma FS + \delta CG$$

where the absolute change in profit (or one of its components exposed to risk) compared with the previous period with the opposite sign is used as risk value (Rrisk);

t = 1, 2, 3 years of prediction time-frame, duration – 1 year, risk modeling step – 1 day.

Let us take a closer look at the first equation in the system (1). The first part of the differential reflects the influence exercised on risk by all factors affecting the unit profitability of assets, and the second part shows the volume of the banking operations depending on the ability of the credit organization to accumulate resources;

DCP^t, NR^t, CP^t – average profitability and rate of reserve and credit portfolio growth;
DFP^t, FP^t – average profitability (with allowance for revaluation) and volume of securities portfolios;
SP^t, P^t – average cost and amount of borrowings;
DV^t, OVP^t – unit profit margin of currency transactions (net foreign exchange position and its amount);
NOD^t – unit standard of net fee and commission income;
EX^t – volume of administrative expenses and other costs;
ROA^t – return on assets at a particular point in time (t);
At – bank assets;
Rez^t – expenses for the creation of reserves;

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VCA – variable component of the current assets;
NCA – non-current assets;
PCA – permanent component of current assets;
LTD – long-term debt;
LTC – long-term funding source.
NWC – level of net working capital defined as: $NWC = AAR + ZAP + G - AAP$;
AAR – accounts receivable;
ZAP – inventory and supplies;
G – cash and cash equivalents;
AAP – accounts payable;
FP – efficiency criterion of the company's operational activity;
SP – efficiency of working capital management;
FS – efficiency criterion of sales and marketing operations;
CG – criterion measuring the competitiveness of goods.
a, β, γ, δ — weight coefficients of the criteria.

Table 5 shows the components of the bank's exposure in the chosen sector of the economy based on system (1).

Table 5. Credit portfolio indicators of a banking group

Performance indicators	Average term of overdue loans, days	Maximum credit period, days	Effective interest rate	Credit limit	ROA	VaR risk factor	Economic capital	Diversification coefficient
	3	120	52.26%	7.39	8.2%	0.10	0.63	82.4%

Source: Compiled by authors

The maximum amount of capital, which shareholders are ready to set as a limit, amounts to 7.3 bln roubles. Considering the overall financial risk, about 1 bln roubles will be sufficient to cover risks, which fully covers the economic capital.

5. Overview

There are a number of models used for determining the integral indicator of competitiveness. For example, General Electric developed the PIMS model in 1960, and its variant is still used by Thomson Reuters. J.-J. Lambin (2007), and M. Porter (2011) suggested a competitiveness assessment system based on comparison with the leading company in the market by identifying internal and external competitiveness factors etc. Charles Schwab Corporation started considering competitiveness from the perspective of credit organizations' needs. K. Schwab (2016) described the structure of the global competitiveness index, while Baruönü Latif (2012) differentiated the assessment criteria for macro- and meso-levels. The authors suggest using competitiveness index, which consists of the following blocks: indicators of the efficiency of operational activity management; indicators of the efficiency of working assets management; coefficients of autonomy and solvency; indicators of marketing quality; indicators of quality-to-price ratio; investment criteria.

To a certain extent, competitiveness is a criterion of acceptable risk for the bank. Thus, M. Tiesset and Ph. Troussard (2007), as well as E. Karpova (2016), define economic capital as the amount of own funds necessary to cover actual risks for a particular credit organization. The authors regard economic capital as an instrument for

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determining the level of credit limit within acceptable risks and as a means of stimulating competitiveness of the borrowing organizations. The amount of limit should be a structured product to provide opportunities for flexible risk management.

Capitalization is often considered as a criterion of competitiveness, for example, in Reuters, Bloomberg information bases. Such popularity, in particular, is connected with the positive experience of using the q-Tobin coefficient. Although this ratio is constantly criticized for the irrationality of the dynamics of this indicator. However, this indicator is still popular in financial analytics. For example, Xavier Gabaix. (2011) in its granular hypothesis proposes to consider capitalization within the business cycles of the largest companies. This paper proposes that specific shocks at the firm level can explain an important part of aggregated movements and provide a micro base for aggregated shocks. By James B. Thomas and Reuben R. McDaniel. (2017), De Backer, J Evans, R., Phillips, K. (2019) and Donde P Ashmos, Dennis Duchon, Reuben R McDaniel Jr. (2000), use approximation methods for dynamic general equilibrium stochastic models (DSGE), introducing competitiveness indicators into them. Of course, you cannot rely on only one criterion, you should use the system, each indicator becomes obsolete and accumulates deformation errors.

Bauerschmidt, P.A., Studnitzer, A.L., Albert, W.J., Callaway, P.J., Farrell, J.W., & Thiruthuvadoss, A.S. (2010) and Sutton, I. (2014) prefer integrated risk management.

Under conditions of uncertainty and a large number of factors, the stochastic general equilibrium model (DSGE) is becoming increasingly popular as a research tool. There is an extensive practice of its use, for example, Christiano, L., Devis, R., Rostano M. (2012) in Evans, R., Phillips, K. (2015 and 2017) proposed a linearization algorithm near the current state. Mojon B. (2000) and De Bondt, G.J. (2005) link the volatility of companies' competitiveness for financial institutions with the dynamics of interest rates.

Conclusions

The authors have suggested a model of competitiveness impact on monetary policy based on a general equilibrium model, which allows to go through and optimize technological aspects and investment criteria balancing between monetary performance and corporate financial indicators. The DSGE model has allowed balancing credit risk, economic capital, amount of working capital, competitiveness for of a group of companies or a cluster. The authors have suggested a block of information describing an integrated competitiveness indicator. These changes will allow expanding the inventory of impact instruments at the disposal of monetary policy. Credit calculated in the form of a structured product will ensure the flexibility of the bank's risk management. Using the information about the upper bound of the economic capital, the bank determines which combination of risk factors can lead to perverse effects and change the development scenario for the borrowing company.

References

Ashmos, D.P., Duchon, D., McDaniel Jr, R.R. 2000. Organizational responses to complexity: the effect on organizational performance. Journal of organizational change management, 13(6): 577-595.

Ashmos, D.P., Duchon, D., McDaniel Jr, R.R. 2007. Participation in strategic decision making: the role of organizational predisposition and issue interpretation. Decision Sciences, 29(1): 25-51.

Aven, T., Renn, O. 2010. Risk management. In Risk Management and Governance. Springer, Berlin, Heidelberg, 121-158.

Bauerschmidt, P.A., Studnitzer, A.L., Albert, W.J., Callaway, P.J., Farrell, J.W., Thiruthuvadoss, A.S. 2010. Cross-currency implied spreads U.S. Patent No. 7,734,538. Washington, DC: U.S. Patent and Trademark Office.

Boivin, J., Giannoni, M. 2006. Has monetary policy become more effective? The Review of Economics and Statistics, 88: 445–462.

Charles Schwab Corporation. n.d. Retrieved from: https://www.schwab.com/

Christiano, L., Devis, R., Rostano, M. 2012. Standard monetary DSGE model https://www.cn.ckgsb.com

Christiano, L.J. 2007. A short course on estimation, solution and policy analysis using equilibrium monetary models. Lecture Notes, Northwestern University.

De Backer, J., Evans, R., Phillips, K. 2019. Integration of tax policy micro-Simulation models into the DSGE macroeconomic model. Public Finance review, 47(2): 207-275.

De Bondt, G.J. 2005. Interest rate through: empirical results for the Eurozone. German Economic Review, 6(1). https://doi.org/10.1111/j.1465-6485.2005.00121.x

Del Negro, M., Schorfheide, F., Smets, F., Wouters, R. 2007. On the fit of new Keynesian models. Journal of Business & Economic Statistics, 25: 123–143.

Delis, M.D. 2012. Bank competition, financial reform, and institutions: The importance of being developed. Journal of Development Economics, 97(2), 450-465.

Evans, R., Phillips, K. 2015. Linearization about the current state: a computational method for approximating non-linear policy functions during simulation. BYU Macroeconomics and Computational Laboratory working Paper Series: 816.

Guerron-Quintana, P., Inoue, A., Kilian, L. 2012. Frequentist inference in weakly identified DSGE models. Quantitative Economics, 4: 197-229.

Karpova, E. 2016. Economic and regulatory capital in Russian banking practice. Moscow Financial – Industrial University "Synergy" Russia, Moscow.

Kerk, L., Phillips, K. 2017. The solution and modeling of unbalanced growth models using linearization about the current state of Economic Letters. Journalism of the Economy, 151: 35-38.

Lambin, J.J., Chumpitaz, R., Schuiling, I. 2007. Market-driven management: Strategic and operational marketing. Translation from French. Saints-Perersburg, Science.

Mojon, B. 2000. Financial Structure and the Interest Rate Channel of ECB Monetary Policy. ECB Working Paper, 40:105-108.

Porter, M.E. 2011. Competitive advantage of nations: creating and sustaining superior performance. Simon and Schuster.
Retrieved from: https://cyberleninka.ru/article/n/2007-02-016-tiesse-m-trussar-f-bazel-2-kapital-normativnyy-i-kapital-ekonomicheskiy-tiesset-m-troussard-ph-capital-reglementaire-et-capital

Rutkauskas, A.V., Stasytytė, V. 2010. Effectiveness, reliability and subject risk–shaping drivers for the set of possibilities and utility function when investment decision is made under uncertainty. The 6th International Conference “Business and Management 2010”: May 13–14, 2010, Vilnius, Lithuania. Vilnius: Technika: 176–183.

Schorfheide, F. 2010. Estimation and evaluation of DSGE models: progress and challenges. University of Pennsylvania, CEPR, NBER, and Visiting Scholar, Federal Reserve Bank of Philadelphia.

Schwab, K. Sala-i-Martin, X. 2016. The Global Competitiveness Report ... of Industrial and Business Management, 6(2). Retrieved from: http://repositorio.colciencias.gov.co/

Sutton, I. 2014. Process risk and reliability management. Gulf Professional Publishing.

Thomas, J.B. McDaniel, R.R. 2017. Interpreting Strategic Issues: Effects of Strategy and the Information-Processing Structure of Top Management Teams. Journal of Academy of management, 33(2), 10510-8020. https://doi.org/10.5465/25632620

Thomas, J.B., McDaniel Jr, R.R. 2017. Interpreting strategic issues: Effects of strategy and the information-processing structure of top management teams. Academy of Management journal, 33(2): 286-306.

Tiesset, M., Troussard, Ph. 2007. Capital reglementaire et capital economique. Revue de la stabilité fi nancière, 7: 63-78.

Tvaronavičienė, M., Masood, O., Javaria, K. 2018. Preconditions of the Eurozone economic security: how to overcome liquidity risk and cost inefficiency in leading banks of UK and Germany, *Polish journal of management studies*, 18(1), 418-427. https://doi.org/10.17512/pjms.2018.18.1.31

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REGIONAL ASPECTS OF THE DEVELOPMENT OF THE CHEESE MARKET IN TERMS OF THE TREND OF HEALTHY NUTRITION

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Abstract. In public nutrition nowadays, the trend of healthy nutrition is gaining momentum. One of the products that can be attributed to this category is cheese. In modern conditions, the consumption of cheese by the population of the country is characterized by high regional differentiation. An analysis of the cheese market and the main factors of its development in the context of the trend of healthy nutrition served as the purpose of this study. The information base of research is the consumption of cheese by the population of the Russian Federation (a case study of the 16 largest regions of the country). Particular attention is paid to the analysis of the cream cheese market, which currently has a low share in the sales structure of this group of goods, but has a high potential for consumption growth. As a result of the analysis, it has been revealed that the greatest influence on the consumption of cream cheese is exerted by such factors as the number of sales outlets per capita in the region, the number of assortment positions in the store, and the level of trade integration.

Keywords: healthy food; regional trade; cheese market; cream cheese; development of the cheese market

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1. Introduction

One of the current trends in the development of modern lifestyle is the promotion of healthy nutrition. A huge role in the development of this trend is played by the trade, directly providing services to end users. An important aspect of the development of healthy nutrition as a function of improving the quality of people's life is the assortment policy of trade organizations. Ivanov (2014) shows the influence of the quality of the goods sold on improving business reputation, and, consequently, increasing the social efficiency of trade in general. The sale of healthy food products is not limited to the economic benefits of the manufacturer and the seller, but, together, plays an important social role (Kornilova & Karashchuk, 2017).

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The period from the mid-20th century to the present is characterized by a strong anthropogenic load on the environment, which has led to a decrease in the level of safety and quality of food products (Eliseeva et al., 2015), and a healthy diet, in the first place, implies safe food products. One of the categories of products that characterize the trend of healthy nutrition is dairy products (Malaws & McDonald, 2018). It should be noted that a feature of dairy products is relatively short shelf life, and, accordingly, a short sale period. In modern conditions, the majority of commodity producers use various methods to increase the above time, which is often negatively perceived by the consumers, in terms of the trend of healthy nutrition. It should be noted that in a number of countries, the sale of raw cow milk for human consumption is prohibited due to regulatory requirements. In this regard, farmers are forced to seek various ways to sell their products (Linn, 2019). Also, a big role in the development of the making of various milk processing products is played by the change of the real prices of raw milk (Santos-Lavalle, 2018).

One of the dairy products, initially having sufficient shelf life to be sold, is cheeses. Canfora (2018) shows the perception of cheese by a number of consumers as an element of healthy nutrition. This category of goods can be sold by commodity producers either through the system of federal and regional distributors or through direct deliveries to the network retail system. Thus, the organization of sales of cheese is an important direction in the functioning of an effective distribution system in the FMCG market (Aleksina, 2018-19). Filipovic (2019) showed the high role of proper cheese distribution in forming consumer preferences.

In works by Buleca (Buleca et al., 2018), it is shown that as a result of the abolition of the quota system, the low price of raw cow milk has significant impact on the processes of production concentration. Ito (2019) revealed the important role of regional factors in forming consumer preferences. Zindy (2017) also showed the high role of the region of cheese production in forming consumer preferences.

Nigri (2014) discusses the benefits of cheese production by local producers. In particular, that paper noted that local production has impact on the environment. This study also allows concluding that there is a high potential for the sale of locally produced cheese. In turn, the innovations in the technological chain of cheese production currently lead to the formation of a wider range of cheese products (Quaranta & Salvia, 2017).

In the conditions of development of a digital economy, the consumers more carefully approach the formation of their choice by studying the properties of a product, reviews about it, which, in the context of the healthy nutrition trend, leads to the formation of a choice of higher-quality cheeses and a decrease in demand for products containing vegetable oils, unsafe components and those undesirable from the point of view of healthy nutrition. The importance of developing the interaction of various parts of regional distribution in the conditions of increasing the social responsibility of trade is shown in works by Mayorova (2018), which also determines the relevance of the study of regional aspects of the sale of healthy food products. A number of researchers currently note the importance of replacing traditional food products with products of their industrial processing (Honfoga et al., 2018). In particular, De-Magistris (2016) has shown that consumers are willing to pay a price premium for a pack of low-fat cheese or low-fat and low-salt cheese appearing together; however, they are not willing to pay for a pack of low-salt cheese. Also, the consumers' trend of healthy nutrition is analyzed by Sanchez-Macias (2012) taking the goat cheese market as a case study.

In works by Boatto (Boatto et al., 2016), the high role of personal preferences and price factors in the sale of cheese is shown.

As problems in the sale of various types of cheese products, it is advisable to note the insufficiently high level of safety of existing production facilities. In this regard, manufacturers need to intensify the use of all necessary measures in order to prevent food contamination (Angelidis et al., 2012). The importance of an environmental approach in the production of cheese is also discussed in research of Ceccarelli (Ceccarelli, 2017).

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Thus, the study of trends in the development of the market for healthy food products, in particular, the cheese market, is relevant. The purpose of this study is to analyze the cheese market in the context of the trend of healthy nutrition, as well as to identify the main factors of its development. In particular, an important aspect is the analysis of the market for cream cheeses, which do not have a significant market share today, but have prospects for increasing this share.

2. Methods

As the information base for this study, cheese consumption in a number of regions of the Russian Federation was chosen, as a state with a rather large level of differentiation of both the standard of living and the culture of cheese consumption in the regional context.

The sample size of the study was 16 largest regions, covering more than 50% of the population. In conducting the study, the priority was to consider the consumption of cheese by the urban population, since it is precisely this category of the population that faces the problem of maintaining a healthy lifestyle. It should be noted that the nature of consumption in large cities quite accurately corresponds to the nature of consumption in the whole country, the correlation coefficient being 0.9.

In recent years, the Russian cheese market has undergone major volumetric and structural changes due to a whole range of economic and socio-political reasons. As a result of the dramatic change in the structure of imports of these products to Russia at the end of 2014, there was a significant shift in the dynamics of the cheese market. As can be seen from Table 1, the segment of the market of hard and semi-hard cheeses suffered most from the crisis, the trend for the decline in sales volumes of which was observed during 2014-2017.

Table 1. Dynamics of sales of cheese in the Russian Federation in physical terms, growth rate, %

Cheese market segments	Years					
	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2018/2013
Hard/Semi-hard cheese	92.76	89.19	97.64	98.62	100.35	79.94
Processed cheese	104.76	104.08	99.55	97.85	100.64	106.89
Cream cheese	103.65	102.82	109.59	109.38	106.29	135.77
Feta/Brynza	91.79	91.58	106.90	107.53	101.50	98.07
Mozzarella	94.92	110.71	106.45	98.48	103.08	113.56
Other	101.84	94.95	92.40	90.12	100.00	80.51
TOTAL	95.84	93.49	98.73	98.50	100.87	87.90

Source: Compiled by the authors according to research company Nielsen

Over the past 4 years, cheese consumption in the Russian Federation has decreased, and only in the last year, there has been a stabilization trend. In particular, in 2018, the consumption of cheese in Russia amounted to 87.9% of the 2013 level. It should be noted that a sharp change in the structure of imports of cheese has a great effect. However, this trend is positive for a number of cheeses. In particular, sales of cream cheese in 2018 amounted to 135.8% of the 2013 level. This trend is sustainable; over the past 5 years, the minimum annual growth rate was 2.8%, the maximum – 9%. For this type of cheese, growth rates are maximum, which determines the prospects for the sales of cream cheese. This is largely consistent with the trend conditions for healthy nutrition.

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As noted above, for the purpose of analysis, the authors selected 16 largest regions of the Russian Federation, with a population exceeding 1 million people. The study analyzed the development of the cheese market, as fully consistent with the analyzed trend for healthy nutrition and demonstrating the highest growth potential. The main factors of influence chosen were such as the number of places of sale of cream cheese per capita, the numerical distribution, the number of SKU (stock keeping units) in the stores, the provision of population with modern shopping formats per 1,000 people, the share of sales via the Internet, the share of turnover of retail chains in the sale of goods, the retail trade per capita, the percentage of male and urban population in the region, the average per capita cash income of the population.

For the purpose of analysis, the calculation of the correlation coefficient was used, and the relationship between real and calculated values was used to estimate nonlinear dependencies.

3. Results

Currently, it is the market segment of cream cheese that shows the steadiest upward trend. As shown in Table 2, over the past 5 years, there has been an increase in the share of cream cheese in total sales (in physical terms) by one and a half times, from 2.59 to 4%.

Table 2. Structure of retail sales of cheese in the Russian Federation in physical terms in 2013 and 2018

Cheese market segments	Share in sales volume, %		Change in sales share
	2013	2018	
Hard/Semi-hard cheese	67.80	61.77	-6.03
Processed cheese	19.45	23.70	4.25
Cream cheese	3.91	4.37	0.46
Feta/Brynza	2.59	4.00	1.41
Mozzarella	1.11	1.44	0.33
Other	5.14	4.71	-0.43
TOTAL	100	100	-

Source: Compiled by the authors according to research company Nielsen

As can be seen from Table 2, despite the insignificant share of cream cheese in the sales structure, the share of cream and processed cheese is currently increasing, while the share of hard and semi-hard cheeses, which constitute a large part of the market, is decreasing.

Table 3 shows the results of the analysis of the main factors that influence the sales of cream cheese.

Table 3. Analysis of the influence of a number of factors on the sales of cream cheese in the Russian Federation in 2016-2018

No.	Factor	Correlation coefficient	
		Sales of cream cheese per capita in the region in physical terms	Share of cream cheese sales in the total retail turnover of the region
1	Number of places of cream cheese sale per capita in the region	0.68	0.82
2	Numerical distribution in the region	0.53	0.36
3	Number of assortment positions (SKU) in the stores of the region	0.76	0.71
4	Provision of the population with modern format shopping areas in the region	0.54	0.45
5	Share of online sales in the region	0.38	0.47
6	Share of retail trade turnover in the sale of goods in the region	0.77	0.84

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No.	Factor	Correlation coefficient	
		Sales of cream cheese per capita in the region in physical terms	Share of cream cheese sales in the total retail turnover of the region
7	Retail trade turnover per capita in the region	0.43	0.12
8	Share of the male population in the region	-0.25	-0.18
9	Share of the urban population in the region	0.64	0.60
10	Per capita income in the region	0.55	0.27

Source: Compiled by the authors

As can be seen from Table 3, the sale of cream cheese in the regions of the Russian Federation is influenced by factors directly related to the presence of retail organizations, in particular, the number of places for the sale of cream cheese per capita, as well as the share of retail chains turnover in the sale of goods. Also, SKU is important (stock keeping units, or the number of positions) in the stores. Some influence is exerted by the proportion of the urban population in the region. The absence of a significant dependency of the share of sales of cream cheese in the total retail trade turnover on the average per capita income of the population is also of interest.

Table 4 shows an analysis of the nature of the dependency between the share of cream cheese sales in the total retail trade turnover and a number of factors.

Table 4. Analysis of the influence of a number of factors on the sales of cream cheese in the Russian Federation in 2016-2018

No.	Factor	Nature of dependency	
		Linear	Nonlinear
1	Number of places of cream cheese sale per capita in the region	0.82	0.83
2	Numerical distribution in the region	0.36	0.36
3	Number of assortment positions (SKU) in the stores of the region	0.71	0.79
4	Provision of the population with modern format shopping areas in the region	0.45	0.59
5	Share of online sales in the region	0.47	0.47
6	Share of retail trade turnover in the sale of goods in the region	0.84	0.88
7	Retail trade turnover per capita in the region	0.12	0.16
8	Share of the male population in the region	-0.18	-0.24
9	Share of the urban population in the region	0.60	0.63
10	Per capita income in the region	0.27	0.27

Source: Compiled by the authors

As can be seen from Table 4, for a number of factors, the nonlinear nature of the dependency can be noted. A general view of the dependency of the share of cream cheese sales in the total retail turnover on such factors as SKU in the region's stores and the share of retail trade turnover in the sale of goods in the region is shown in Figure 1 and Fugure 2.

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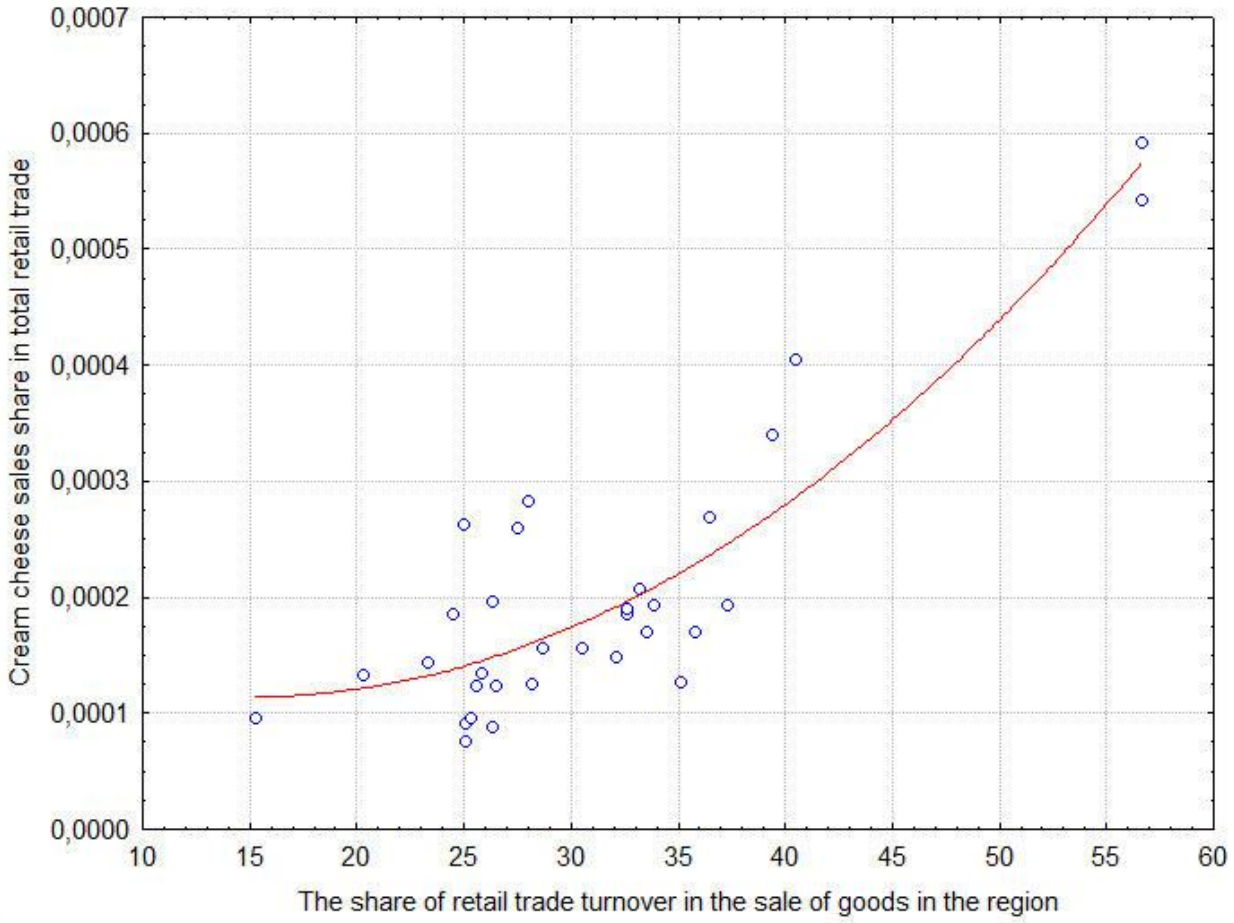

Fig. 2. Dependency of the share of sales of cream cheese in the total retail turnover on the share of the turnover of retail chains in the sale of goods
Source: Compiled by the authors

As shown in Fig. 2, the dependency of the share of sales of cream cheese in the total retail trade turnover on the share of retail trade turnover in the sale of goods in the region is high and is also characterized by outstripping growth rates.

Of interest is the comparison of the sales of cream cheese with other types of cheeses. In particular, as was shown earlier, a segment of processed cheese also has great development potential. In particular, Talbot-Walsh (2018) showed that processed cheeses with enhanced health benefits were of great interest to producers and consumers. Fig. 3 shows the relationship of the sale of processed and cream cheeses.

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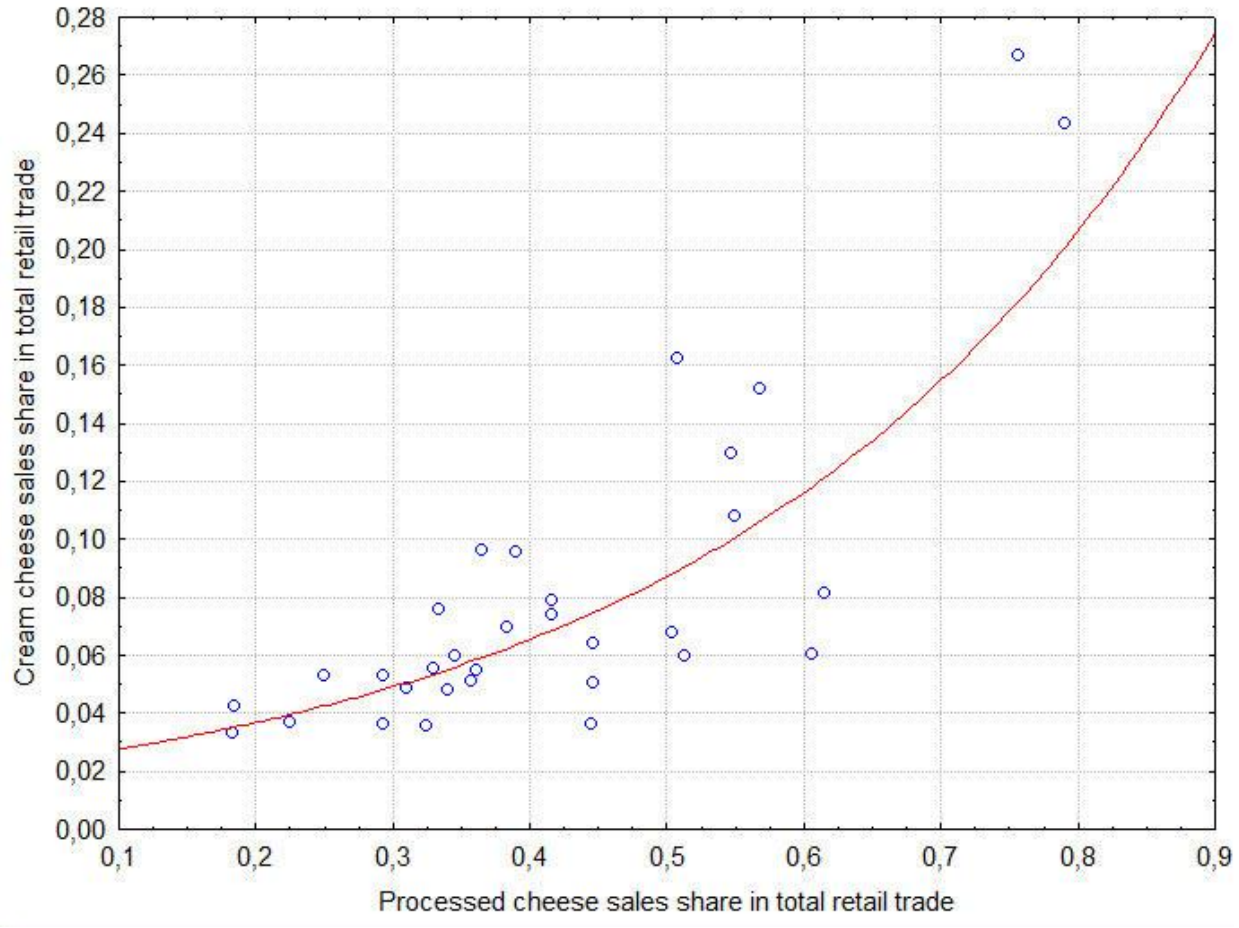

Fig. 3. Relationship of the sale of processed and cream cheese
Source: Compiled by the authors

The correlation coefficient between the sale of cream and processed cheese is 0.79. Moreover, as can be seen in Fig. 3, there has been an outstripping growth rate of sales of cream cheese compared to processed cheese.

Table 5 shows the impact of a number of factors on the sales of cream and processed cheese in the Russian Federation in 2016-2018.

Table 5. Analysis of the influence of a number of factors on the sales of cream and processed cheese in the Russian Federation in 2016-2018

No.	Factor	Correlation coefficient	
		Cream cheese	Processed cheese
1	Number of places of cream cheese sale per capita in the region	0.82	0.72
2	Numerical distribution in the region	0.36	-0.05
3	Number of assortment positions (SKU) in the stores of the region	0.71	0.27
4	Provision of the population with modern format shopping areas in the region	0.45	0.38
5	Share of online sales in the region	0.47	0.55
6	Share of retail trade turnover in the sale of	0.84	0.82

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No.	Factor	Correlation coefficient	
		Cream cheese	Processed cheese
	goods in the region		
7	Retail trade turnover per capita in the region	0.12	-0.21
8	Share of the male population in the region	-0.18	-0.22
9	Share of the urban population in the region	0.60	0.56
10	Per capita income in the region	0.27	-0.03

Source: Compiled by the authors

As can be seen from Table 5, the sale of cream cheese is more influenced by factors related to its availability in stores, in particular, the number of cream cheese sale places per capita in the region and the number of stock keeping units or assortment positions (SKU) in the stores of the region. The share of retail trade turnover has a strong influence on the sales of both types of cheese.

4. Discussion

As a result of the analysis, the authors revealed a high role in the consumption of cheese of such a factor as the level of trade development. In turn, the characteristic of trade as an important component of the economic and social way of life of the population is characterized in works by Mayorova (2016). In particular, it is shown that the sale of goods which form a positive image of trade organizations plays an important role in increasing the efficiency of their operation. These goods also include dairy products.

Currently, the population of the Russian Federation is insufficiently provided with dairy products. Thus, the availability of dairy products in one of the typical regions of the Russian Federation is three-quarters of the recommended consumption rates (Oseneva et al., 2017-8). The reasons for this include the low investment attractiveness of dairy cattle, an increase in the share of counterfeit products and a number of other negative factors (Seifullaeva et. al., 2017). However, in other countries, the level of consumption of dairy products, and in particular cheese, plays an important role in the national agriculture and is organically combined with the use of modern microbiological achievements (Eriksson & Bull, 2017). In this regard, the authors present various ways to solve this problem. For example, the paper by Eliseyeva (Eliseeva & Makhotina, 2012) analyzes the potential for replacing dairy products of natural animal origin with their plant analogs.

Currently, the level of cheese consumption in the Russian Federation is in the range of 6-7 kg per capita, while the average European level of cheese consumption, according to the research company Nielsen, is 19.2 kg per capita. Grashuis (2018) shows the potential for differentiating the consumption of cheese as an important direction for the development of farm trade. In particular, it is shown that consumers are willing to pay for the origin of the product. In turn, this confirms the authors' conclusions on the development potential of various types of cheese and a high dependency on the number of stock keeping units or assortment positions (SKU) in the stores. In the works by Dreyer (Dreyer, et al., 2016), the importance of consumption traditions is shown (a case study of Parmesan cheese), which also confirms the high role of the depth of cheese assortment in the stores. Lokhman (2018) addresses the sales of particular types of cheese products using gaming incentives. The paper shows the great potential of the opportunity of influencing consumer preferences.

The results obtained by the authors on the significant value of the number of places of cheese sale confirm the conclusions and, in many respects, coincide with the results of research by Titus (2016), which also shows the high role of product availability in the maximum possible number of stores. Also, the results obtained by the authors in connection with the high influence of the number of cottage cheese sale places are largely interrelated with the research by Mesic (2018), describing the importance of various distribution channels when selling food products.

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In the works by Vargas-Bello-Perez (2014), it has been shown that the main buyer of cheese in the family is a woman (52%), which confirms the slight negative correlation of sales of cheese obtained by the authors depending on the male population share.

Thus, the results obtained by a number of modern scholars largely confirm the authors' conclusions formulated in this study.

Conclusions

As a result of the study conducted by the authors in accordance with the goal, an analysis of the dairy products market was carried out taking cream cheese sales as a case study. The result confirms the hypothesis put forward by a number of scholars about the individual preferences in the formation of cheese consumption, which determines the importance of the parameters associated with assortment policy. In particular, such factors as the number of cream cheese sales places per capita in the region and the number of stock keeping units, or assortment positions (SKU) in the stores had significant impact. The level of trade integration, in particular, the development of trade networks in the region, also demonstrates a naturally large role.

As a general conclusion, it is necessary to note the positive trends in the sale of dairy products (in particular, cheese) in the past year, as well as the high potential for its development in the future.

References

Aleksina, S.B. 2018-19. Scenarios for the development of distribution strategy in the FMCG market under increasing pressure from federal trade networks. *Russian Journal of Entrepreneurship*, 3: 709-724. https://doi.org/10.18334/rp.19.3.38835

Angelidis, A.S., Georgiadou, S.S., Zafeiropoulou, V. Velonakis, E.N., Papageorgiou, D.K., & Vatopoulos, A. 2012. A survey of soft cheeses in Greek retail outlets highlights a low prevalence of Listeria spp. *Dairy Science & Technology*, 92(2): 189-201. https://doi.org/10.1007/s13594-011-0049-y

Boatto, V., Rossetto, L., Bordignon, P., Arboretti, R., & Salmaso, L. 2016. Cheese perception in the North American market Empirical evidence for domestic vs imported Parmesan. *British Food Journal*. 118(7) https://doi.org/10.1108/BFJ-09-2015-0315

Buleca, J., Kováč, V., & Šubová, N. 2018. Milk production related to price of raw cow's milk in selected European countries. *Potravinarstvo Slovak Journal of Food Sciences*, 12(1): 798-805. https://doi.org/10.5219/1002

Canfora, C., & Ottmann, A. 2018. Of ostriches, pyramids, and Swiss cheese risks in safety-critical translations. *Translation Spaces (Netherland)*, 7(2): 167-201. https://doi.org/10.1075/ts.18002.can

Ceccarelli, M. 2017. Milk magic and related topics in Sumerian texts. [Milchzauber und Verwandtes in sumerischen Texten] *Fabula*, 58(3-4): 375-382. https://doi.org/10.1515/fabula-2017-0032

de-Magistris, T., & Lopez-Galan, B. 2016. Consumers' willingness to pay for nutritional claims fighting the obesity epidemic: the case of reduced-fat and low salt cheese in Spain. *Public health*, 135: 83-90. https://doi.org/10.1016/j.puhe.2016.02.004

Dreyer, H. C., Strandhagen, J. O., Hvolby, H., Romsdal, A., & Alfnes, E. 2016. Supply chain strategies for speciality foods: A Norwegian case study. *Production Planning and Control*, 27(11): 878-893. https://doi.org/10.1080/09537287.2016.1156779

Eliseeva, L. G, & Makhotina, I. A. 2012. *Influence of the induced autolysis biotechnology on the biological value of the lupine flour (book chapter)*. Modern problems in biochemical physics: New Horizons. Nova Science Publishers, Inc. pp. 231-235

Eliseeva, L.G., Makhotina, I.A., Gorozhanin, P.P., & Yurina, O.V. 2015. Experience in the application of bioassays with planarian in the studies of drinking bottled water safety. *Mediterranean Journal of Social Sciences*, 6(2S4): 29-32.

Eriksson, C., & Bull, J. 2017. Place-making with goats and microbes: The more-than-human geographies of local cheese in Jämtland, Sweden. *Journal of Rural Studies*, 50: 209-217. https://doi.org/10.1016/j.jrurstud.2017.01.010

Filipovic, J. 2019. Market-Oriented Sustainability of Sjenica Sheep Cheese. *Sustainability*, 11(3): 834. https://doi.org/10.3390/su11030834

Grashuis, J., & Magnier, A. 2018. Product differentiation by marketing and processing cooperatives: A choice experiment with cheese and cereal products. *Agribusiness*, 34(4): 813-830. https://doi.org/10.1002/agr.21551

Honfoga, B. G., N'tandou-Bonzitou, G., Vodouhè, R. S., Bellon, M. R., & Hounhouigan, J. D. 2018. Assessing the role of market integration in the consumption of traditional foods in benin: A joint price instability coefficient and diet composition approach. *Agricultural and Food Economics*, 6(1). https://doi.org/10.1186/s40100-018-0097-1

Ito, B., Mukunoki, H., Tomiura, E., & Wakasugi, R. 2019. Trade policy preferences and cross-regional differences: Evidence from individual-level data of japan. *Journal of the Japanese and International Economies*, 51: 99-109. https://doi.org/10.1016/j.jjie.2018.12.003

Ivanov, G., & Mayorova, E. (2014). Business reputation and trade efficiency. *Economic Annals-XXI*, 1 (1-2): 54-57.

Linn, M. 2019. Making milk with conscious care: Raw milk ontologies and the practices of 'bath milk' producers in Victoria, Australia. *Journal of Rural Studies*, 65: 135-142. https://doi.org/10.1016/j.jrurstud.2018.10.010

Malaws, B., & McDonald, M. 2018. Bwrdd marchnata llaeth*: Four milk marketing board creameries in wales. *Industrial Archaeology Review*, 40(1): 25-38. https://doi.org/10.1080/03090728.2018.1452589

Mayorova, E. 2018. Assessing the Corporate Social Responsibility of Retailers for Compliance with Consumer Expectations. *Proceedings of the 32nd International Business Information Management Association Conference*, IBIMA 2018 - Vision 2020: Sustainable Economic Development and Application of Innovation Management from Regional expansion to Global Growth, November 15-16, 2018, Seville, Spain, 1899-1904.

Mayorova, E.A., & Lapitskaya, N.V. 2016. Assessment of customers' perception of social responsibility of trade business. *International Journal of Economics and Financial Issues*, 6(2): 158-163.

Mesic, Ž., Molnár, A., & Cerjak, M. (2018). Assessment of traditional food supply chain performance using triadic approach: The role of relationships quality. *Supply Chain Management*, 23(5): 396-411. https://doi.org/10.1108/SCM-10-2017-0336

Lokhman, N., Karashchuk O. & Kornilova O. 2018. Analysis of eSports as a commercial activity. *Problems and Perspectives in Management*, 16(1): 207-213. https://doi.org/10.21511/ppm.16(1).2018.20

Nigri, E.M., de Barros, A.C., Rocha, S.D.F., Romeiro, E. 2014. Assessing environmental impacts using a comparative LCA of industrial and artisanal production processes: "Minas Cheese" case. *Food Science and Technology*, 34(3): 522-531. https://doi.org/10.1590/1678-457X.6356

Kornilova, O. & Karashchuk, O. 2017. Socially responsible business in trade: further development in Ukraine and Russia. *Problems and Perspectives in Management*, 15(3): 445-452. https://doi.org/10.21511/ppm.15(3-2).2017.12

Oseneva O.V., Shchetilina I.P., & Borisova V.V. (2017-8). Analysis of the structure of the consumer basket and the purchasing power of the population of the Voronezh region in relation to dairy products. *Azimuth of Scientific Research: Economics and Administration*, 2(23): 251-253

Quaranta, G., & Salvia, R. 2017. *Social-based product innovation and governance in the milk sector: The case of carciocacio and innonatura*. Driving agribusiness with technology innovations, pp. 293-310. https://doi.org/10.4018/978-1-5225-2107-5.ch015

Sanchez-Macias, D., Moreno-Indias, I., Alvarez, S., Clevelan, M., Castro, N., Arguello, A., & Fresno, M.D. 2012. Sensory analysis of full-, reduced- and low-fat cheese elaborated with raw goat milk. *Journal of Applied Animal Research*, 40(2): 124-132, https://doi.org/10.1080/09712119.2011.633880

Santos-Lavalle, R., Flores-Verduzco, J.J., Cervantes-Escoto, F., Salas-Gonzalez, J.M., Sagarnaga-Villegas, L.M. 2018. Opportunities for goat farmers in Guanajuato, Mexico, in the marketing of fine cheese. *Revista Mexicana de Ciencias Pecuarias*, 9(3): 601-613. https://doi.org/10.22319/rmcp.v9i3.4500

Seifullaeva, M. E., Shirochenskaya, I. P., Shklyar, T. L., Mkhytaryan, S. V., & Panasenko, S. V. 2017. Strategy of import substitution at Russian food market. *International Journal of Economic Perspectives*, 11(3).

Talbot-Walsh, G., Kannar, D., & Selomulya, C. 2018. A review on technological parameters and recent advances in the fortification of processed cheese. *Trends in Food Science and Technology*, 81: 193-202. https://doi.org/10.1016/j.tifs.2018.09.023

Titus, R. 2016. Analyzing in-store & consumer factors in Adoption of Cheese as a Retail Product in Indian Market. *International conference on business and economics (ICBE2016)*, pp. 471-472.

Vargas-Bello-Perez, E., Aguilar, C., Toro-Mujica, P., Vera, R.R., Cerda, M., & Briones, I. 2014. Characterization of cheese consumers in Santiago Province, Chile. *Ciencia e Investigacion Agrarian*, 41(3): 327-335. https://doi.org/10.4067/S0718-16202014000300005

Zindy, P., Halawany-Darson, R., & Hauwuy, A. (2017). Consumers' perception and attitude towards regional "terroir" products: focus on "terroir" cheeses. *Inra Productions Animals*, 30(3): 229-240.

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TOWARDS TO A SINGLE INNOVATION SPACE IN THE AGRARIAN SECTOR OF THE MEMBER STATES OF THE EURASIAN ECONOMIC UNION: A CASE STUDY

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Abstract. The article deals with the formation of a single innovation space in the agrarian sector of the member states of the Eurasian Economic Union with the aim of rational use of their total scientific potential. The approaches to the formation of a common innovative space of the EU countries are considered. A distinctive feature of the modern stage of development of the innovation space in the agro-industrial sector of the Eurasian Economic Union is the intensification of cross-border cooperation of the participating countries. Models of interstate cooperation in the scientific and technical sphere were developed and a "panel of indicators" for the development of the market for scientific and technical products was proposed. Practical recommendations are given on innovation transfer in the agrarian sector of the economy of the member states of the Eurasian Economic Union. The economic effect will be manifested in increasing the volume and competitiveness of agricultural products, increasing the yield of agricultural producers, increasing the volume of innovative products and their share in the global agri-food market.

Keywords: Eurasian Economic Union (EAEU), innovation space, models of interstate cooperation, "panel of indicators".

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JEL Classifications: F02, F01, Q01

1. Introduction

Effective innovative development in the framework of integration requires a common focus and mutual coordination of the innovation activities of the countries participating in the integration association. The cooperative, synergistic effect of innovative development with integration is associated with the possibility of using various forms of interaction – the creation of common funds, pilot sites, the implementation of joint projects, clustering of organisations belonging to academic and non-academic sectors etc. (Asaliev et al., 2014 a,b; Tvaronavičienė, Razminienė, 2017; Ivanova et al., 2018).

The EU experience confirms that the common EU innovation space has common goals and principles of functioning within the framework of economic integration. At the same time, national innovation systems of European countries are considered separately from the common space and have their own characteristics (Asheim, Coenen, Moodysson, Vang, 2007).

There is no single model for the formation of the innovation space. It is specific for each country and is shaped by the national specifics of economic, industrial and regional development (Johnson and Hinton, 2019). For example, France implements in its innovative development the policy of "poles of competitiveness", i.e. the creation of specialized innovation clusters with state priority, which is not typical for developed industrial countries (Les labellisations des pôles depuis, 2005). In the UK, innovation centres are created to develop specific technologies and promote them to the market (for example, Printable Electronics Technology Centre, PETEC) or for a specific sector of the economy or market (Korableva and Kalimullina, 2014; Bentahar and O'Brien, 2019; Zavyalova, 2018; Puryaev, 2015; Mueller et al., 2019). Such centres are considered as strategic drivers of economic development at the regional level (Ministry of Economic

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Development of Russia. Reference on the International Experience of Innovative Development). The use of the results of scientific and technical activities and intellectual property in the agrarian sphere of the member states of the Eurasian Economic Union (hereinafter referred to as the EAEU) serves as the basis for the production of competitive products in the agro-industrial complex of the Union countries, ensuring their food safety. The relevance of the study determines the need for the formation of a single innovative space, and, consequently, the market of agricultural scientific and technical products of the EAEU member states. In the course of studying the possibilities of forming a single innovation space in the Eurasian Economic Union, the authors used the following methods: abstract-logical, monographic, economic-statistical, balance, expert assessments.

2. Results

The "single innovative space" of the EAEU member states should be understood as the territory where a single complex of economic, innovation and legal events is held. This category should not be identified with an "innovation sphere" – the area of activity of producers and consumers of innovative products (works, services), including the creation and distribution of innovations (Zhuravlev et al., 2018; Korableva et al., 2018; Ladatko and Nechaev, 2005, p. 30).

A single innovation space in the agrarian sector of the EAEU member states has not yet been formed, although the Recommendation of the EEC Board (hereinafter referred to as EEC) (dated February 19, 2013) No. 3 "On the Need to Prepare the Procedure for Developing and Recommending Intergovernmental Programs within a Single Economic Space" and the Decision of the Collegium of the EEC of July 8, 2015. No. 14, which highlighted promising areas for R & D until 2020, were adopted (Recommendation of the Board of the Eurasian Economic Commission of February 19, 2013, No. 3; Recommendation of the Board of the Eurasian Economic Commission of July 8, 2015, No. 14).

The formation of a single innovation space is directly related to the implementation of the goals and objectives presented in the programs and development strategies of the agro-industrial complex of each EAEU member country (Concept of the Strategy of Innovative Development of Armenia; The Concept of Innovative Development of the Republic of Kazakhstan until 2020; Science and Innovation Activities in the Republic of Belarus; The Main Directions of the Strategy for Sustainable Socio-Economic Development of the Agro-Industrial Complex of the Russian Federation for the Period up to 2030; Development of the Agro-Industrial Complex and Cooperation).

The authors support an approach towards formation of a single innovation space in the agrarian sector of the EAEU member states, which claims that success of such attempts directly depends on digitalization – replacing analogue (physical) data collection and processing systems with technological systems that generate, transmit and process a digital signal about their condition (Lincaru et al., 2018; Pogodina et al., 2019, Order of the Government of the Russian Federation dated July 2, 2017 No. 1632-p; Strategy for the Scientific and Technical Development of the Russian Federation until 2035).

Digitalization will affect all existing markets, including markets for innovative products, since they will all have a networked nature, which will have a positive effect on the growth of labour productivity in the industry (Gamede and Uleanya, 2018; Kamolov et al., 2019; Hanfan and Setiawan, 2018; Polyakova et al., 2019). At the same time, one of the main distinguishing features of the current stage of development of the innovation space in the agro-industrial sector is the intensification of cross-border cooperation, by analogy with the European Union. As an example of such interaction, the creation of a cross-border cluster (Russia-Kazakhstan) on deep processing of grain, which the authors considered in the previous works, should be given (Nechaev and Mikhayushkin, 2017; Nechaev et al., 2017; Kolpak et al., 2017; Barmuta et al., 2017; Dzhavatov et al., 2018; Dunets et al., 2019).

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It is the effectiveness of their development, and not only in the border areas but also abroad, that will, in the future, determine the positions of the EAEU member states in the agrarian sector of the economy, not only in the domestic but also in the global agri-food markets. The result of this cross-border cooperation will be: the expansion of the sales market for agricultural products based on innovative technologies, the development of a competitive environment, the creation of new jobs, the growth of export revenues from the sale of competitive products in the domestic and foreign markets, and the inflow of investments in the agricultural sector (Ponomareva et al., 2019). The formation of a single innovation space in the agrarian sphere of the EAEU member states is hampered by a number of problems:

- lack of supranational coordination of scientific, technical and innovation potentials, identifying the interests of the countries-partners for cooperation, identifying strategically possible technological spheres in them for the development of joint innovation projects;
- the high cost of this process in the formation of the interstate space coordinating the potential of innovation systems of cooperation partners in the global scientific, technical and educational space;
- imperfection (absence) of the model of integration relations in science, technology and financial policy, which makes it necessary to delegate part of the national authority to a supranational level (by analogy with the EU);
- the continuing contradictions of the national interests of the EAEU Member States in the market for innovative products;
- adverse global conjuncture in the agricultural market for scientific and technical products (price fluctuations, changes in demand, credit restrictions, the financial instability of all members of the Union);
- lack of a system for training scientific personnel for interstate innovation cooperation, innovation infrastructure, entrepreneurship in the scientific and technical sphere, investment mechanisms and other development institutions.

At the same time, there is an objective expediency of forming a single innovative space in the agricultural sector of the EAEU member states in order to optimize the use of scientific and financial resources to ensure the sustainability of the market for scientific and technical products in order to stimulate mutually beneficial innovative development of national agro-industrial complexes of the Union countries.

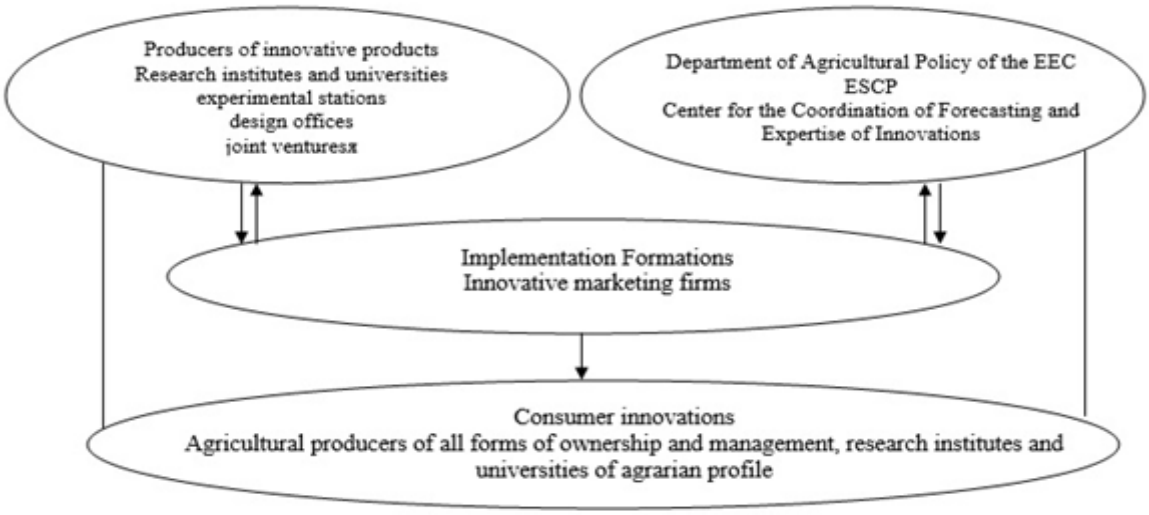

Fig.1. Conceptual model of the innovation market in the agricultural sector of the EAEU member states
Source: Research Report, 2017

The Eurasian Agricultural Technological Platform created in accordance with the decision of the Eurasian Intergovernmental Council of April 13, 2016 No. 2 “Regulations on the Formation and Functioning of Eurasian Technological Platforms” and facilitating cooperation in the scientific and technological and innovation spheres based on the unification of the scientific and financial potentials of the states of the Union,

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effective interaction of all interested parties (business, science, government, and intergovernmental organizations) in order to stimulate mutually beneficial innovative development of national agrarian complexes, constant technological renewal of production and increase the competitiveness of their products (Decision of the Eurasian Intergovernmental Council of April 13, 2016 No. 2).

The further formation of interstate innovation space can be carried out on the basis of models of interstate cooperation. The conceptual model of the innovation market in the agrarian sector of the EAEU member states is presented in Figure 1. In the presented model, on the polar sides there are the producers of innovative products and their consumers – agricultural producers of all forms of ownership, as well as the organizations of the science itself: research institutes and educational institutions of the agricultural sector. Based on the experience of various integration associations, and in accordance with the Recommendation of the EEC Board dated February 19, 2013 No. 3 and the Decision of the EEC Board of July 8, 2015. No. 14 to create and master the achievements of scientific and technological progress, it is advisable to create interstate research structures (Recommendation of the Board of the Eurasian Economic Commission of February 19, 2013, No. 3; Recommendation of the Board of the Eurasian Economic Commission of July 8, 2015, No. 14).
The functional model of the research and production interstate formation within the EAEU is presented in Figure 2.
At the stage of development and use of the model, it is planned to create several functional blocks:
- research and production coordination;
- development of production and sales of finished innovative products based on network technologies;
- production of high-quality agricultural products;
- production of finished products based on innovative technologies (resource-saving and environmentally friendly);
- development of market infrastructure for the sale of finished products in the markets of the EAEU and third countries.

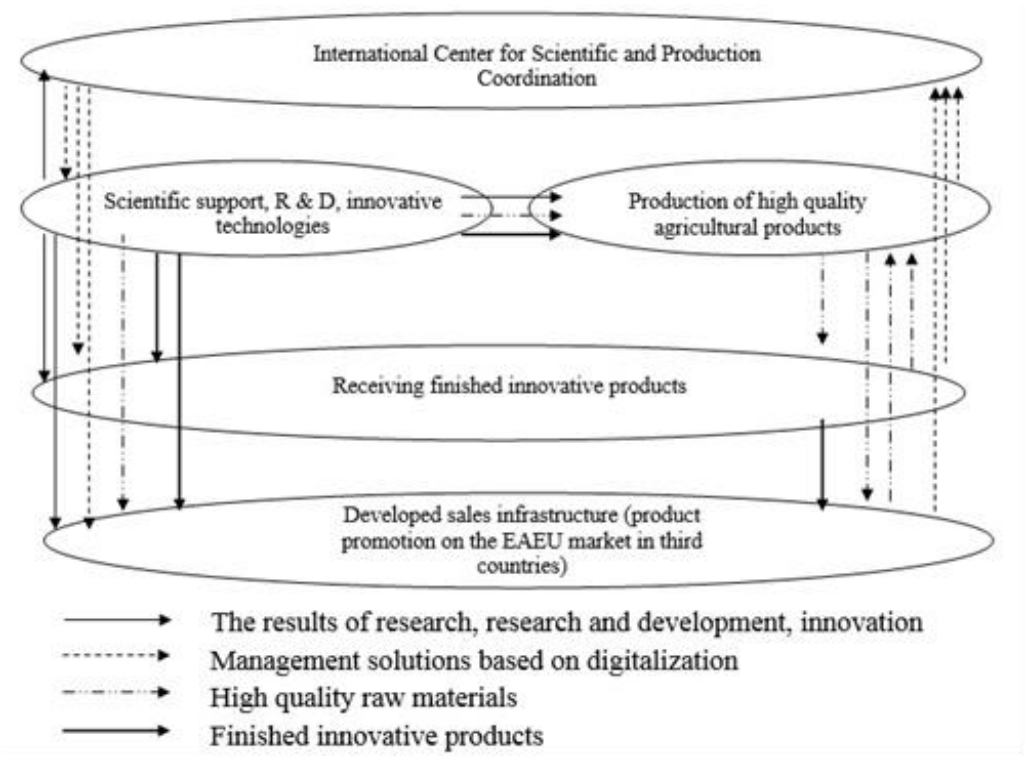

Fig.2. Functional model of a research and production interstate formation within the EAEU
Source: Research Report, 2017

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It should be noted that as of January 1, 2016, 65 joint ventures and more than 40 organizations with foreign capital operate in the agrarian sector of the EAEU member states. Their field of activity is focused on the production of potatoes, vegetables, livestock products, their processing, as well as the provision of various types of services (Research Report, 2017).

The mechanism of interaction of participants in interstate innovative entrepreneurship in the agricultural sector is presented in Figure 3. This mechanism is characterized by a complex interstate structure and consists of a set of models of innovative entrepreneurship, as well as two main blocks – organizational and economic. The main priorities of the organizational block of interaction of participants in interstate innovative entrepreneurship should include the creation of a supranational centre under the auspices of the Eurasian Economic Commission (hereinafter ECE) to coordinate innovative developments and introduce them into production (Darin and Telyakov, 2017; Telyakov et al., 2016), indicative planning and coordination of R & D, training innovative managers, creating information and consulting and marketing firms (Prodanova et al., 2019b; Sadriev & Mullakhmetov, 2016; Suratno, 2018; Takhumova et al., 2018; Zagrivnyi et al., 2019).

The economic block of interaction of participants in interstate innovative entrepreneurship in the agrarian sphere includes: interstate support based on the creation of a single financial fund to subsidize a part of interest rates on loans received for creating, acquiring and introducing innovations into the real economy of the EAEU member states; preferential taxation and insurance of risky (venture) innovations in the territory of a single innovative space; common approaches in pricing innovative products; leasing of scientific and technical equipment and other financial and economic methods and tools at the interstate level.

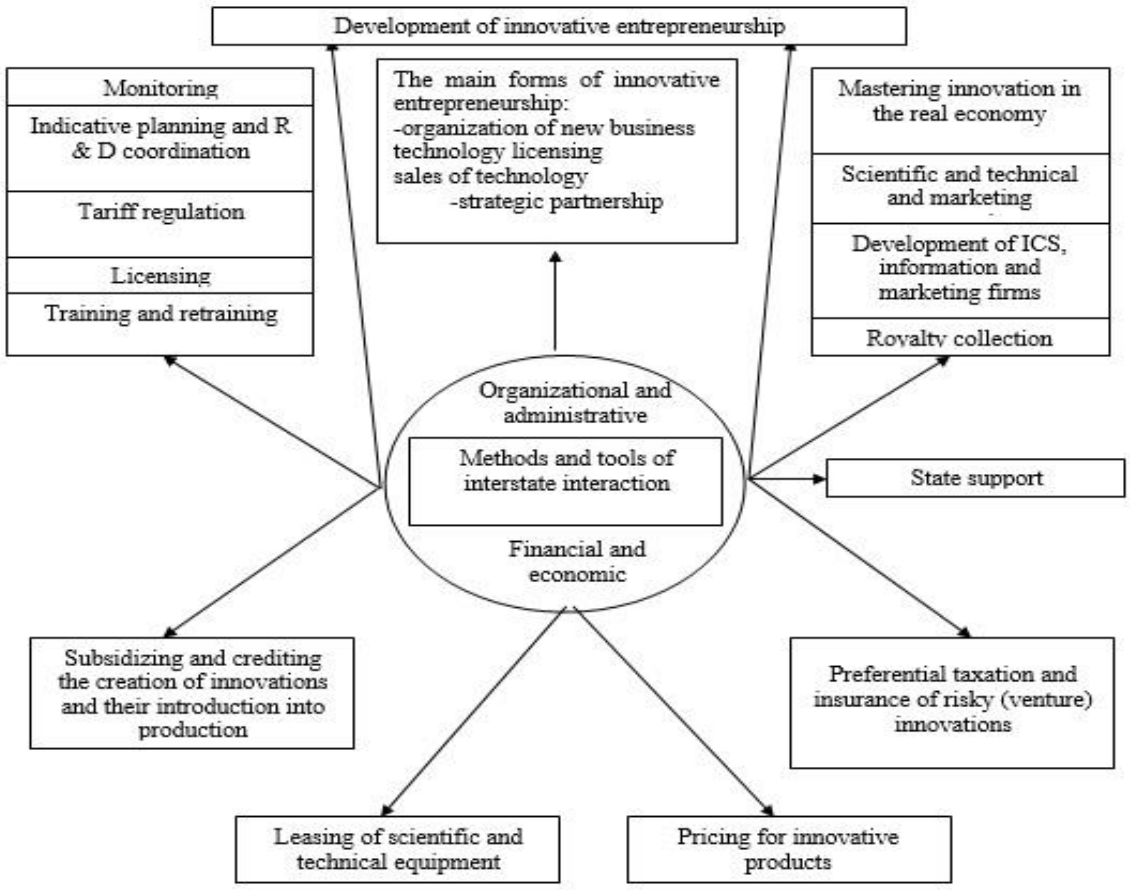

Fig.3. Mechanism of interaction between participants in interstate innovative entrepreneurship in the agricultural sector of the EAEU member states
Source: Research Report, 2017

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The development of interstate cooperation to form a single innovative space in the agrarian sector of the economy of the EAEU member states should be carried out in stages, starting with the creation and development of institutions and mechanisms for expanding the market for scientific and technical products and unhindered movement of capital and technology (Osadchy, 2015; Goloshchapova et al., 2018; Prodanova et al., 2019a; Voronkova et al., 2019). To this end, a market infrastructure should be formed as a priority – a set of institutions and organizations, consulting and information and marketing firms that ensure the free movement of scientific, technical and innovative products in the agricultural market.

It is the effectiveness of their development, as well as the degree of participation of the EEC in creating a favourable business environment in the future, that will determine the position of the EAEU member states in the global market for scientific and technical products (Malarev et al., 2018). In this regard, it will be useful for the EAEU member states to use the experience of the development of integration processes in the European Union based on the use of interstate agreements for the implementation of joint innovation projects. At the present stage of development of a single innovative space of the EAEU member states, it is proposed to limit the creation of a number of intergovernmental non-governmental organizations, among which the International Agrarian Scientific Society of the Union countries and the International Association "Agro-Education" should be noted. The first type of organizations is created to prepare for the EEC recommendations for the development of the market for scientific, technical and innovative products; the second is designed to assist educational institutions in fulfilling the tasks of staffing and scientific support for the development of the agro-industrial complex of the EAEU member states; maintain close ties with interstate and public organizations; study and distribute advanced foreign experience of the best educational, research and educational institutions; prepare innovative managers to work in the conditions of creating a single innovative space of the EAEU member states.

Particular attention should be paid to the development of practical methods of transferring innovations to the agro-industrial production of the Union countries on the basis of an agreed set of price (discounts, bonuses), financial (deferred payment, instalments for a long period, leasing), credit (subsidizing interest rates), technical (maintenance and repair in the regions of supply of equipment), as well as the use and improvement of the mechanism of public-private partnership in the promotion of advanced innovative developments in the agricultural sector of the Union economies.

The basis of the innovation space in the agrarian sector of the economy of the EAEU member states, along with the national innovation systems, is the market for scientific and technical products (STP), which should be understood as the totality of intellectual property objects, market agents, legal mechanisms, and information means by which the price level of the STP is formed and acts of sale are carried out. Currently, in the countries of the EAEU, the STP market is not developed and requires the direct and indirect influence of the state and intergovernmental authorities for its improvement proposed by the authors (Mikhailushkin et al., 2018; Ladatko and Nechaev, 2005; Nechaev, 2018; Yemelyanov et al., 2018; Ilyina et al., 2019; Polyakova et al., 2018).

In order to manage the STP market and carry out its quantitative assessment, the authors used the "panel of indicators" of the development of the market for scientific and technical products in the agricultural sector of the EAEU member states, presented in Figure 4, which allows assessing the current state of this market in the context of international trends (National Report on Innovations in Russia, 2017).

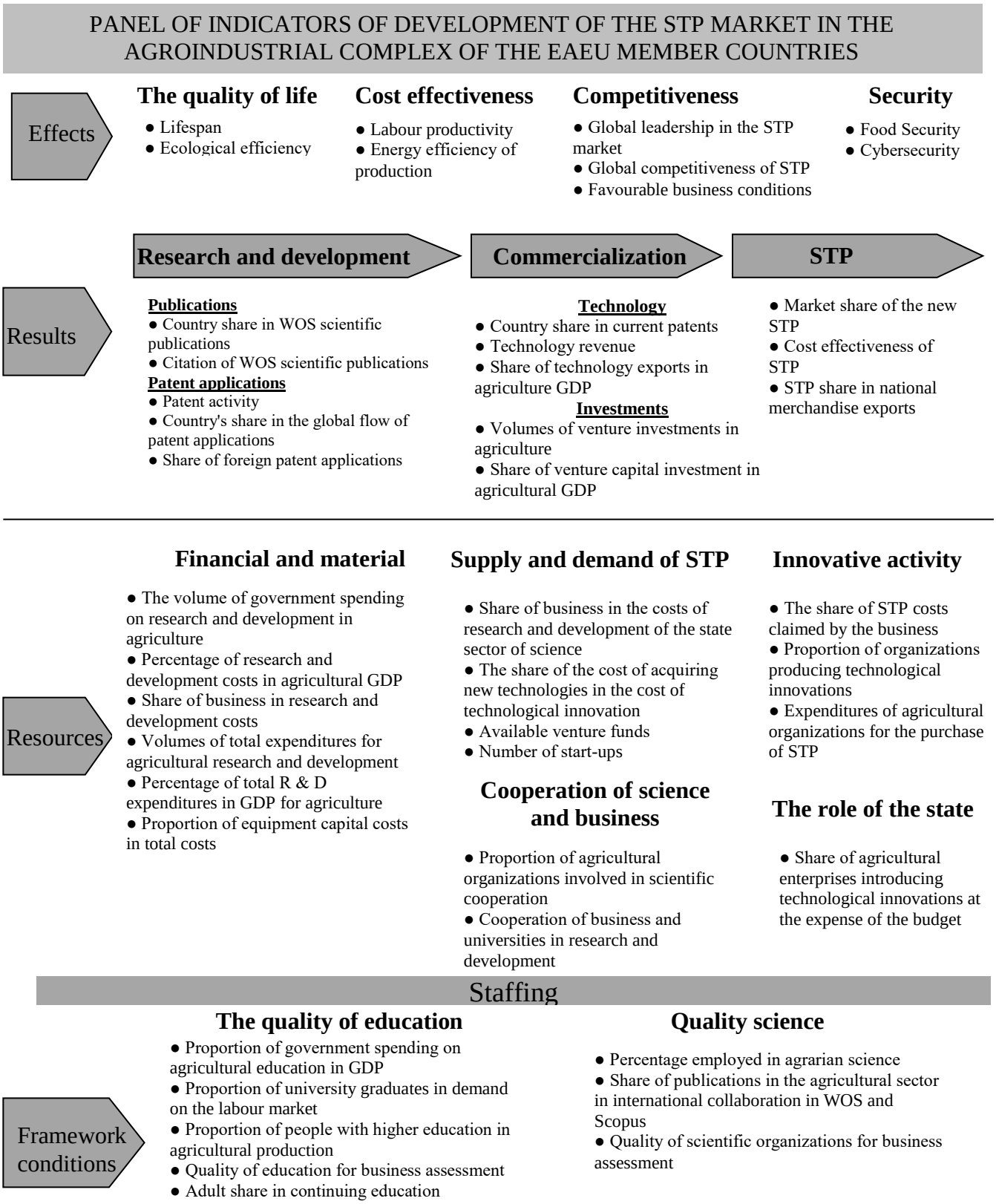

Fig. 4. Panel of indicators of the development of the market for scientific and technical products in the agricultural sector of the EAEU member states

Source: National Report on Innovations in Russia, 2017

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In the presented "Panel of Indicators" all indicators are grouped as follows: according to the stages of the development of the NTP market (horizontally); by levels of innovation space (vertical).

For most indicators of the impact of innovation on the economy and society, including the growth rates of labor productivity and life expectancy, Russia still lags behind the leading innovation economies. The country has not yet become a global leader in high-tech markets, domestic products are characterized by insufficient competitiveness.

There are negative dynamics in the development of research and production cooperation, gaps between science, education and business persist: the share of domestic industrial enterprises participating in joint research projects has decreased 1.1 times in the last two years, in general, for the period 2010–2017 years - 1.3 times. In the long run, there is no significant improvement in Russia in terms of indicators characterizing the results of commercialization (although, for example, the country's share in the total number of active patents among 45 countries has increased, but the de facto situation cannot be considered satisfactory).

3. Conclusion

The formation of a single innovation space in the agrarian sector of the EAEU member states on the basis of models of interstate cooperation will allow solving an important interstate problem of ensuring the access of the Union's agricultural producers to advanced agricultural technologies. Such an approach will help the countries to gain real economic effect from combining scientific and financial potentials, ensure mutual economic interest and build on this basis a mutually beneficial strategy for sustainable socio-economic development of the agrarian sector of the EAEU member countries on the basis of innovation. The achieved results of such cooperation would allow keeping decent positions both in the domestic and global agri-food markets.

References

Asaliev, A. M., Poltarykhin, A. L., & Alkhimenko, O. N. (2014a). Intellectual capital: Theory and approaches of its assessment on macro level. World Applied Sciences Journal, 30(10), 1404-1408. http://doi:10.5829/idosi.wasj.2014.30.10.14187

Asaliev, A. M., Zhuravlev, P. V., & Alkhimenko, O. N. (2014b). Intellectual capital management as the aspect of upgrading of modern companies management. *Life Science Journal*, 11(SPEC. ISSUE 11), 363-366.

Asheim B., Coenen L., Moodysson J., Vang J. (2007). Constructing knowledge-based regional advantage: implications for regional innovation policy. International Journal of Entrepreneurship and Innovation Management, 7, 140.

Barmuta, K.A., Yakovenko, Z.M., Zadorozhnaya, L.I., Mironov, D.S., & Klochko, E. N. 2017. Advantages of cluster approach in managing the economy of the Russian federation. International Journal of Applied Business and Economic Research, 15(23): 355-364.

Bentahar, A., O'Brien, J. L. (2019). Raising students' awareness of social justice through civic literacy. Journal of Social Studies Education Research, 10(1), 193-218.

Concept of the strategy of innovative development of Armenia. Retrieved from http://iidf.am/docs/concept-innov-armenia.pdf

Darin, A. A., & Telyakov, N. M. (2017). Processing of ferromanganese concretions with the use of sulfatising roasting. Journal of Engineering and Applied Sciences, 12(5), 1113-1115.

Decision of the Eurasian Intergovernmental Council of April 13, 2016. №2 "Regulations on the formation and functioning of the Eurasian technological platforms"

Decision of the Eurasian Intergovernmental Council of April 13, 2016. №2 "Regulations on the formation and functioning of the Eurasian technological platforms"

Development of the agro-industrial complex and cooperation / Sustainable Development Strategy of the Kyrgyz Republic for 2018-2040. [Electronic resource] http://cbd.minjust.gov.kg/act/view/ru-ru/61542

Development of the agro-industrial complex and cooperation / Sustainable Development Strategy of the Kyrgyz Republic for 2018-2040. Retrieved from http://cbd.minjust.gov.kg/act/view/ru-ru/61542

Dunets, A. N., Ivanova, V. N., Poltarykhin, A. L. 2019. Cross-border tourism cooperation as a basis for sustainable development: a case study. Entrepreneurship and Sustainability Issues, 6(4), 2207-2215. https://doi.org/10.9770/jesi.2019.6.4(45)

Dzhavatov, D.K., Sverdlikova, E.A., Sokolov, M.S., Avdeeva, O.A., & Yavkin, G.P. 2018. The influence of innovation on social and economic development of the Russian regions. European Research Studies Journal, 21(Special Issue 2): 767-776.

Gamede, B.T., & Uleanya, C. 2018. Entrepreneurship: Solution to unemployment and development in rural communities. Journal of Entrepreneurship Education, 21(Special Issue)

Goloshchapova, L. V., Plaskova, N. S., Prodanova, N. A., Yusupova, S. Y., & Pozdeeva, S. N. (2018). Analytical review of risks of loss of profits in cargo transportation. International Journal of Mechanical Engineering and Technology, 9(11), 1897-1902.

Hanfan, A., & Setiawan, A.I. 2018. Exploiting regio-centric product advantage to increase small and medium enterprises' (SMEs) marketing performance. International Journal of Economics and Business Administration, 6(2): 3-26.

Ilyina, I., Kulibanova, V., & Teor, T. 2019. Special aspects of master data-based integrated management of region reputation in modern IT environment. Paper presented at the IOP Conference Series: Materials Science and Engineering, 497(1) http://doi.org/10.1088/1757-899X/497/1/012022

Ivanova, V. N., Atyukova, O. K., & Poltarykhin, A. L. (2018). Prerequisites of growth of investment and social attractiveness of the regions of russia within the framework of implementation of the public-private partnership projects. International Journal of Mechanical Engineering and Technology, 9(11), 2299-2305.

Johnson, C., & Hinton, H. (2019). Toward a Brillant Diversity. Journal of Culture and Values in Education, 2(1), 56-70. Retrieved from http://cultureandvalues.org/index.php/JCV/article/view/27

Kamolov, S. G., Artemova, P. V., & Berezko, V. E. 2019. Shaping the systems of digital public governance of the digital economy in Russia and abroad. Studies in Computational Intelligence, 826: 435-442. http://doi.org/10.1007/978-3-030-13397-9_51

Kolpak, E. P., Sulimova, E. A., Kireev, V. S., Samarina, E. A., & Solodilova, N. Z. 2017. Clustering as a criterion for the success of modern industrial enterprises. International Journal of Applied Business and Economic Research, 15(23): 221-231.

Korableva, O. N., & Kalimullina, O. V. 2014. The formation of a single legal space as a prerequisite for overcoming systemic risk. *Asian Social Science, 10*(21), 256-260. http://doi.org/10.5539/ass.v10n21p256

Korableva, O. N., Kalimullina, O. V., Zaytseva, A. A., & Larionov, A. I. 2018. Elaboration of database for the subject domain of innovation and economic growth potential. Paper presented at the *Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020*, 6065-6073.

Ladatko, O. V., Nechaev, V. I. 2005. Intellectual Property from A to Z: Handbook. Printing House of the Kuban State Agrarian University, Krasnodar, p. 701.

Les labellisations des pôles depuis. 2005. http://competitivite.gouv.fr/la-politique-des-poles-depuis-2005/les-labellisations-des-poles-de-competitivite-476.html

Lincaru, C., Pirciog, S., Grigorescu, A., Tudose, G. (2018). Low-Low (LL) High Human Capital Clusters In Public Administration Employment - Predictor for Digital Infrastructure Public Investment Priority - Romania Case Study. *Entrepreneurship and Sustainability Issues*, 6(2), 729-753. http://doi.org/10.9770/jesi.2018.6.2(18)

Malarev V.I., Kopteva A.V., Koptev V.Yu. 2018. Electric Power Supply System Development for Down-hole Electric Steam Generators to Produce High-viscosity Oil. International Multi-Conference on Industrial Engineering and Modern Technologies, FarEastCon. http://doi.org/10.1109/FarEastCon.2018.8602954

Mikhailushkin, P. V., Lubkova, E. M., Shilova, A. E., Zhuravlev, P. V., Karpenko, E. Z., & Nikiforov, S. A. (2018). Possibilities of agriculture competitiveness increasing. *International Journal of Mechanical Engineering and Technology*, 9(11), 1401-1412.

Ministry of Economic Development of Russia. (2019) Reference on the international experience of innovative development http://economy.gov.ru/minec/about/structure/depSvod/doc20110407_02

Mueller, J. E., Chikunov, S. O., Fedchenko, E. A., & Pronskaya, O. N. 2019. Innovative technologies in entrepreneurship education: The case of European and Asian countries. Journal of Entrepreneurship Education, 22(1)

National report on innovation in Russia. 2017. https://www.rvc.ru/upload/iblock/c64/RVK_innovation_2017.pdf

Nechaev, V. 2018. The organizational and economic mechanism of the functioning of the NTP market in the agroindustrial complex of the EAEU member countries. Economics of Agriculture of Russia, 8: 85-93.

Nechaev, V.I, Mikhayushkin, P.V, Slepneva, T.N. 2017. New approaches to the deep processing of grain based on the formation of an interstate cluster. Economics of agricultural and processing enterprises, 9: 52-55.

Nechaev, V.I., Mikhayushkin, P.V., Altukhov, A.I. 2017. Formation of a cross-border agro-industrial cluster of EAEU countries for deep processing of grain. Strategy for the development of the agricultural sector of the economy: problems and solutions. Collective monograph. Krasnodar: Enlightenment-South, p. 703c.

Order of the Government of the Russian Federation of July 28, 2017 No. 1632-p Program "Digital Economy of the Russian Federation" [Electronic resource] Access mode: http://static.government.ru/media/files/9gFM4FHj4PsB79I5v7yLVuPgu4bvR7M0.pdf

Osadchy, E. A. 2015. The intellectual capital importance and the role of organizations against the backdrop of a crisis: Innovation vector. *Social Sciences (Pakistan)*, 10(6): 1013-1020. http://doi.org/10.3923/sscience.2015.1013.1020

Polyakova, A. G., Goloshchapova, L. V., Rakhmeeva, I. I., Noeva, E. E., & Rakovskiy, V. I. 2018. A model of regional economic space modernization. European Research Studies Journal, 21(Special Issue 2): 624-634.

Polyakova, A. G., Loginov, M. P., Serebrennikova, A. I., & Thalassinos, E. I. 2019. Design of a socio-economic processes monitoring system based on network analysis and big data. *International Journal of Economics and Business Administration*, 7(1): 130-139.

Pogodina, T.V., Aleksakhina, V.G., Burenin, V.A., Polianova, T.N., Yunusov, L.A. (2019). Towards the innovation-focused industry development in a climate of digitalization: the case of Russia, *Entrepreneurship and Sustainability Issues*, 6(4), 1897-1906. http://doi.org/10.9770/jesi.2019.6.4(25)

Ponomareva, N. V., Zvereva, A. O., Golubtsova, E. V., & Ilyashenko, S. B. (2019). Tax incentives for use of alternative energy sources in the russian federation. International Journal of Energy Economics and Policy, 9(4), 144-148. http://doi.org/10.32479/ijeep.7964

Prodanova, N. A., Plaskova, N. S., Bochkareva, N. G., Babalykova, I. A., Gazizyanova, Y. Y., & Zherelina, O. N. (2019a). Integrated Corporate Reporting as An Innovative Business Reporting Model. International Journal of Engineering and Advanced Technology, 8(5), 2075-2078.

Prodanova, N. A., Trofimova, L. B., Adamenko, A. A., Erzinkyan, E. A., Savina, N. V., & Korshunova, L. N. (2019b). Methodology for assessing control in the formation of financial statements of a consolidated business. International Journal of Recent Technology and Engineering, 8(1), 2696-2702.

Puryaev, A. S. 2015. The mathematical apparatus of compromise of efficiency estimation of investment projects. International Business Management, 9(5): 856-861. https://doi.org/10.3923/ibm.2015.856.861

Recommendation of the Board of the Eurasian Economic Commission dated February 19, 2013 N 3 "On the need to prepare the procedure for the development and implementation of intergovernmental programs within the Common Economic Space" [Electronic resource] - Access mode: https://www.alta.ru/tamdoc/13rk0003/

Recommendation of the Board of the Eurasian Economic Commission No. 14 dated July 8, 2015 "On the list of promising research and development activities in the field of the agro-industrial complex of the member states of the Eurasian Economic Union until 2020" [Electronic resource] - Access mode: http://www.garant.ru/products/ipo/prime/doc/71025632/ (Appeal date: 16.01.2019)

Report on research work. Development of promising directions and mechanisms for the development of a coherent agro-industrial policy of the member states of the Eurasian Economic Union, including the field of interstate cooperation and import substitution. Stage 3. Preparation of proposals for the creation of models of interstate cooperation, networks and infrastructure in the promising for the cooperation sector of the agro-industrial complex, on the mechanisms of their interaction and evaluation of their effectiveness. Under the contract number H-12/171 dated September 16, 2016, Moscow, 2017. p. 46

Sadriev, R. D., & Mullakhmetov, K. S. (2016). Russian business medium: Competition problems. *International Journal of Economics and Financial Issues*, 6(8Special Issue): 30-38.

Science and innovation activities in the Republic of Belarus. (Statistical collection) [Electronic resource]. - Access mode: http://www.belstat.gov.by/ofitsialnaya-statistika/publications/izdania/index_8305/

Suratno, A.P.S. 2018. Effect of government investment and capital participation on local own-source revenue: The case of Indonesia. European Research Studies Journal, 21(4): 368-377.

Takhumova, O. V., Kasatkina, E. V., Maslihova, E. A., Yumashev, A. V., & Yumasheva, M. V. 2018. The main directions of increasing the investment attractiveness of the Russian regions in the conditions of institutional transformations. Espacios, 39(37)

Telyakov, N. M., Darin, A. A., Telyakov, A. N., & Petukhov, A. A. (2016). Influence of the specific character of the content of iron-manganese concretions of the Pacific Ocean and Baltic Sea on technological indicators of valuable component extraction. Tsvetnye Metally, 2016(2), 40-45. http://doi.org/10.17580/tsm.2016.02.06

Tvaronavičienė, M., Razminienė K. 2017. Towards competitive regional development through clusters: approaches to their performance evaluation. Journal of Competitiveness, 9(4), 133 - 147, https://doi.org/10.7441/joc.2017.04.09

The concept of innovative development of the Republic of Kazakhstan until 2020 (adopted in 2012) [Electronic resource]. - Access mode: http://adilet.zan.kz/rus/docs/P1200000990

The main directions of the Strategy for sustainable socio-economic development of the agro-industrial complex of the Russian Federation for the period up to 2030. M: OneBook.ru, 2018. p. 58

The strategy of the scientific and technological development of the Russian Federation until 2035 [Electronic resource] http://sntrrf.ru/upload/iblock/c80/Decree%20President%20РФ%20o%20Strategy%20scientifictechnological%20development%20Russia%20Federation

Voronkova, O. Y., Iakimova, L. A., Frolova, I. I., Shafranskaya, C. I., Kamolov, S. G., & Prodanova, N. A. (2019). Sustainable development of territories based on the integrated use of industry, resource and environmental potential. International Journal of Economics and Business Administration, 7(2), 151-163.

Yemelyanov, V., Yemelyanova, N., & Nedelkin, A. (2018). Diagnostic system to determine lining condition. Paper presented at the MATEC Web of Conferences, 172 http://doi.org/10.1051/matecconf/201817204001

Zagrivnyi E. A., Malarev V.I., Kopteva A.V. 2019. Studying the Operating Mode of the Down-Hole Electrode Heater for the Production of High-Viscosity Oil. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus pp. 1110-1113. http://doi.org/10.1109/EIConRus.2019.8656868

Zavyalova, N. 2018. BRICS soft power promotion: Dataset for media preference and use pattern among the Russian audience who follow the development of BRICS. Data in Brief, 16: 939-946. http://doi.org/10.1016/j.dib.2017.12.004

Zhuravlev, P. V., Poltarykhin, A. L., Alkhimenko, O. N., & Kuksova, O. D. (2018). Human capital and its efficiency in the knowledge economy: The role of continuing education. Espacios, 39(46)

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ECONOMIC POLICY FOR COUNTRY'S DIGITALIZATION: A CASE STUDY*

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Abstract. The theoretical foundations for the development of the digital economy and e-government are considered in this article. The main objectives of Russia's transition to the digital economy are listed. The relevance of the development of the digital government concept is considered. The indicators of the current level of state development in the framework of digitalization and the formation of e-government are analyzed. The main problems, the solution of which makes the implementation of the digital government project of the Russian Federation possible, are singled out. Digital economy development is associated not only with the progress of the information technology and innovation industry, but also with the improvement of the labor market, where new jobs, professions and personnel are created. In this regard, there is a rapid process of the foundation of society, where one job becomes low-paid, and new professions allow one to receive a personal income at the level of top managers of small and medium-sized enterprises.

Keywords: digital economy; digital government; Russian economy; e-government

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1. Introduction

The modern world cannot be imagined without the extensive use of information technologies, which have facilitated the commercial activities of enterprises exponentially while the management system has been made more perfect (Perpelyak and Salomatina, 2014). It is for this reason that research in the field of "digital economy" has a high level of relevance since it analyzes a new direction of economic theory and practice.

Based on research in the modern society development, Decree of the President of the Russian Federation of 09.05.2017 No. 203 entered into force the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030 (hereinafter the Information Society Strategy). The goal of the Information Society Strategy is to create conditions for the knowledge society formation in the Russian Federation. This normative legal act is designed to promote: human potential development, safety and security of the citizens and the state, improvement of the Russia's role in the global humanitarian and cultural space, improvement of the efficiency of the government, development of the economy and social sphere, as well as formation of the digital economy (Asaliev et al., 2014; Korableva et al., 2018).

2. Methods

The Information Society Strategy is a long-term regulatory legal act. The goal-setting within the framework of long-term planning is aimed primarily at the stability improvement of the economic situation within the state.
Digital economy is an activity in which production key factors are the data presented in digital form, and their processing and using in large volumes improve the efficiency, quality and productivity in various types of production, technology, equipment, during storage, sale, delivery and the consumption of goods and services (Perpelyak & Salomatina, 2014).
A cosmopolitan diffusion of digital technologies in the economy and society since the end of 20th century resulted in a situation where the experts have begun to discuss the digital revolution, leading to large-scale and radical transformations of many aspects of business, providing unprecedented opportunities and penetrating all fields of global economy (Smirnova & Rudenko, 2017; Korableva et al., 2017; Akhmetshin et al., 2017; Kovalenko et al., 2018a; 2018b). In many ways, these transformations are due to the digital technology properties, namely:

- ✓ high quality, rapidity, inerrancy and reliability of transmission, storage and processing of digital signals (accuracy, inerrancy, safe-keeping and integrity, high image quality);
- ✓ flexibility – a wide range of types of information with which digital technologies work (texts, numbers, photo, audio, video);
- ✓ the possibility of endless reproduction of the signal (information) without compromising its quality (for example, a display of a page on the Internet);
- ✓ zero (minimum) signal transmission marginal costs within the network structure;
- ✓ ease of use, user-friendliness, flexibility and convenience of interfaces, the development of a variety of services for consumers (for example, various screen formats, resolutions, picture size, etc.);
- ✓ integrability of different systems, since digital technology uses the communication between the devices based on standardized protocols. This allows one to build flexible multi-level integrated systems.

The digital economy development is observed in almost all countries of the world, including Russia. For example, according to the state programs for the development of the national economy of the Russian Federation in the framework of the transition to a digital economy, the following strategic goals are set (Draft of the digital economy program, 2018; Andieva and Filchakova, 2018; Carothers, 2018): the growth of public involvement in

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the digital economy (Kamolov, 2019; Mikhailushkin et al., 2018); the creation of a market infrastructure, ensuring the development of information technologies and interaction of the digital economy subjects; cost reduction in the interaction of the following subjects "citizens – state – business"; improvement of the competitiveness level of the economy (Sadriev & Mullakhmetov, 2016; Kamolov, 2017; Chernopyatov et al., 2018; Khairutdinov et al., 2018; Oumlil & Juiz, 2018).

Undoubtedly, a positive factor, contributing to the widespread of digital technologies is the rapid decline in prices for digital devices with the equally rapid expansion of their functionality. The ability of digital devices to operate for years without service is also important.

Digital technologies are becoming not just a tool for implementing the strategy of modernizing public administration (Nechaev et al., 2018; Krasyuk et al., 2018), but also largely determine the direction of change.
If in the early stages, states seek to maximize the share of public services available in electronic form, then as digital transformation proceeds, the composition of public services will change and the number of types of services provided will decrease. Similarly, the popular idea of "state as a platform" is not relevant for the stages of fully digital and "smart government" (Table 1).

Table 1. Maturity stages of digital government: from e-government to "smart government" (according to Gartner's classification)

Parameter	E-government	Open government	Data centric government	Fully digital ruler	"Clever ruler
	Initiation	Development	Definition	property	property
Priority aspects	Performance requirements, efficiency	Transparency and openness	Subject value	Control	Optimization
The main channel for the provision of public services	Government services portal	Public administration as a platform	Non-state	Transformation	Resilience
Core technology	Service	Open data, open services	state channels	Using different channels	Automation replaces portals
Performance Indicators	Orienteering	The share of open data in total data	Opening all data	Things like data	Smart machines (robotization)

Source: according to Gartner's classification

An analysis of the maturity stages of digital government proposed by Gartner's experts shows that an important sign of digital transformation is not only changing the way government functions (public services) are implemented, including processes and subprocesses performed when performing public functions and government services, but and their understanding and composition. We illustrate these considerations on the example of some types of state functions (services) (Fig. 1).

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As it is	How can
- A citizen applies for a public service (to the authority, to the MFC, to the portal) and receives the result of the service; - Document = paper; - The organization reports to the tax authorities, extra-budgetary funds, statistics authorities, etc., incl. in electronic form through "digital intermediaries"; - The organization independently records the data of production control, which is the subject of verification; - Development of public policy - rule-making departments as a reaction to high-profile cases, formal consultations.	- State services are presented by default upon the occurrence of life events; - Document = entry in the registry; - The accounting program automatically reports to the authorities; - Documentary checks are carried out in an autonomous (automatic) mode; - Remote control and autonomous correction in case of detection of violations (for example, over-emissions); - Continuous adaptation of state regulation, taking into account the needs of the final recipients and assessing the effect of the implemented policy.

Fig. 1. Examples of changes in public administration based on digitalization

Source: Baranova, 2017

Thus, based on the above analysis, under the digital transformation we propose to understand the qualitative change based on the digitization of the content of public administration, including its individual procedures, stages of the management cycle, public functions and their types, leading to an increase in the quality of public administration. At the same time, the quality of public administration is understood as its compliance with three key criteria — validity, effectiveness and efficiency.

Digital technologies can significantly transform the processes of monitoring and evaluating the results achieved. In this sense, international initiatives on the use of “big data” for official statistics (including as an alternative to the traditionally used methods) are of interest. In 2017, under the UN Department of Statistics, a Global Working Group on “Big Data” was created to develop a strategic vision, direction and global program on the use of “big data” for official statistics, to support the practical use of “big data” sources for statistical purposes and develop solutions to the challenges associated with their use, as well as support capacity development and the exchange of experience on this issue.

The Global Working Group includes twenty countries and nine international organizations. In 2015-2017 Global Working Group has carried out significant work on the collection and systematization of information Russia is not a member of the Global Working Group on projects aimed at using “big data” in official statistics. The corresponding database is published on the website of the organization.

Thus, the technologies of the Internet of Things and “big data” make it possible to use fundamentally new data sources beyond the limits of traditional statistics and administrative data of agencies for monitoring the results of public policy implementation. Digital platforms are often used for monitoring and evaluating the effectiveness and efficiency of state authorities in foreign practice, especially in terms of monitoring and assessing the quality of public services.

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3. Results

In order to implement the state program “Information Society (2011–2020)” in 2014, the following main activities were defined in the Ministry of Economy and Development of Russia:
- formation of an automated information system "Federal Register of State and Municipal Services (functions)";
- evaluation of the activities of state and municipal authorities on the transfer of services into electronic form, monitoring of provided state and municipal services in electronic form;
- development and maintenance of the functioning of automated processes for the provision of state and municipal services;
- development of monitoring to identify the quality of the provision of state and municipal services through the information and analytical system;
- development of the open data portal in the Russian Federation, methodological assistance of state and municipal authorities to provide access to open data;
- development of an automated information system within the framework of the state programs of the Russian Federation, which ensures the openness of the activities of state and municipal authorities;
- development of the methodology of the state automated information system "Management";
development of information systems that are aimed at supporting small and medium-sized businesses.
The trends that undoubtedly affect e-government include the increased importance of knowledge sharing and interoperability, transformation in service delivery and integration, flexible organizational structure and ubiquity. If we apply these effects to the four functions of e-government, we get the following picture of new trends (Fig. 2).

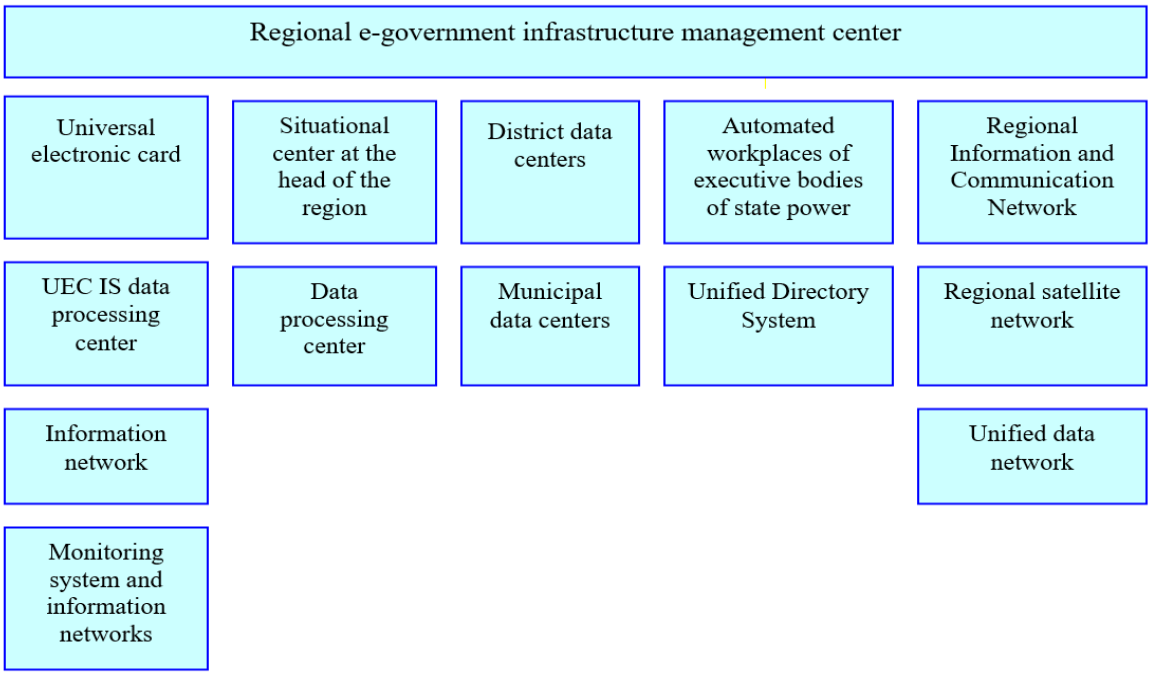

Fig.2. Factors and development trends of e-government

Source: Baranova, 2017

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Currently, the Government of the Russian Federation is still far from the implementation of its project on adaptation to digital space. Accordingly, in terms of Competitiveness in the field of e-government, the country ranks 35th in the world ranking. The rating is even worse in terms of Digital competitiveness, – the 42nd place (Kosorukov, 2017).

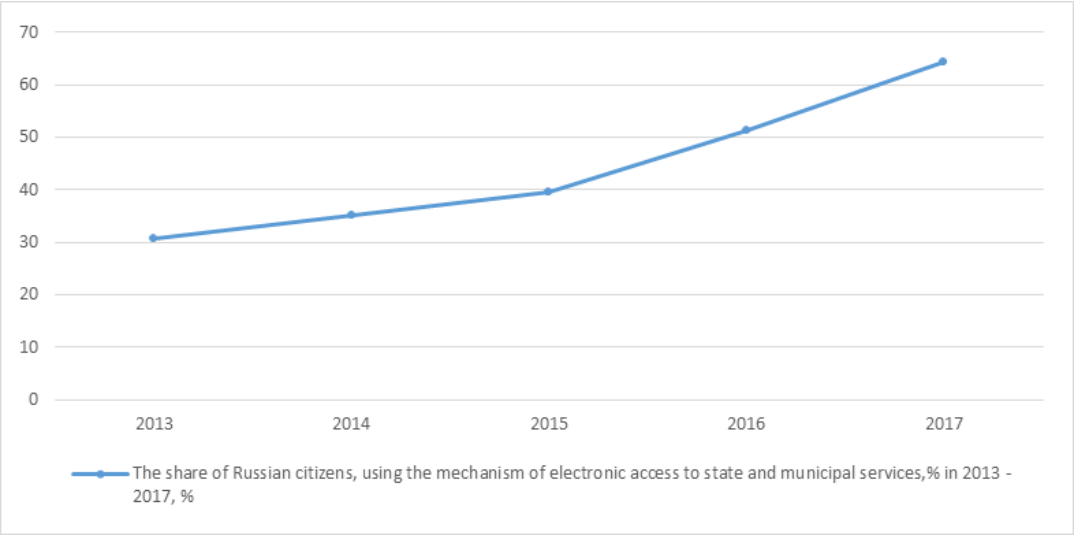

Fig. 3. The share of Russian citizens, using the mechanism of electronic access to state and municipal services in 2013-2017, %

Source: Fedstat, 2018

At the same time, a positive trend in the number of citizens using the mechanism for obtaining state and municipal services through the electronic form can be observed (Figure 1).

Consider examples of a comparative nature in the formation of e-government activities in the countries of near and far abroad. The most authoritative, complete and stable among the existing e-government development level ratings is the OOH Global E-Government Survey (Global E-Government Survey) rating, which has been published since 2003 (Andreeva, 2017).

It is based on the e-government development index. The country's e-government development index is calculated as the result of averaging three private indices: the level of development of online services, infrastructure, and human capital. In addition, the UN also calculates the e-participation index (e-participation), the results of which do not affect the e-government development indicator. Table 2 shows the figures for the e-government index (1) and the e-participation index (2) in the UN global reports of Russia, Kazakhstan, Belarus, Ukraine and Armenia.

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Table 2. UN Global Reports of e-government of Russia and neighboring countries

UN Global Reports	Russian Federation		Kazakhstan		Armenia		Republic of Belarus		Ukraine	
	1	2	1	2	1	2	1	2	1	2
2004	58	91	83	69	86	91	81	102	54	24
2006	52	41	69	59	83	97	58	32	45	24
2008	50	61	65	47	106	83	51	36	48	28
2010	60	98	81	98	103	135	56	98	41	14
2012	59	86	46	18	110	135	64	51	54	48
2014	27	19	38	3	94	161	61	109	68	83
2016	27	30	28	22	61	59	55	92	87	77
2018	35	32	33	67	87	84	49	76	62	32

Source: according to own research

Enhancing citizen feedback, providing electronic services to them, creating public service portals for providing online transactions on a "single window" principle, as well as unified information and reference support systems for citizens and organizations is an incomplete list of the global trend of e-government development (Baranova, 2017).

The components of e-government in the United States are state online services, the most popular of which are income tax registration, licensing requests for fishing and hunting, renewal of professional licenses, transfer of employment information, registration of complaints about organizations, and public loan requests. E-learning provides learning opportunities to federal institutions.

In 2012, the UN published the results of a study of the countries of the world over the previous two years, a review entitled "E-Government Review 2012. E-Government for People" ("United Nations E-Government Survey 2012"). According to the main results of this study, the Republic of Korea is the world leader in the field of e-government (e-government index for this country is 0.9283), then the Netherlands is located (0.9125), the United Kingdom (0.8960) and Denmark (0.8889). The groups of leaders are followed by countries such as the USA, Canada, France, Norway, Singapore and Sweden.

The main reason for digital inequality is the lack of information and communication infrastructure, which impedes the use of information and knowledge.

Nevertheless, the expectations of citizens and businesses, which are formed on the basis of the experience of a wider use of technology, as well as new goals set by the leading countries in the framework of digital government development strategies, indicate not only that it is necessary to bring to the logical end all the ongoing activities but also to look into the future and outline the transition to the development and implementation of the next phase of the strategy, namely the strategy of transition to digital government (Digital Government 2020, Poltarykhin et al., 2018).

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4. Discussion

At the present stage of development of the digital government in Russia, the practical implementation of the principle of designing digital services by default, reorienting the multifunctional centers and other service centers to train citizens to perform the operations online without the need to maintain a personal presence mode is important (Prodanova et al, 2019b). The government should provide for the possibility to use the mobile devices to carry out transactions from beginning to end when each new state or municipal service is converted into electronic form. For the successful implementation of the principle of the provision of digital services by default, the government services in digital format should be attractive and easy to use for the vast majority of citizens. It is necessary to change the government's approach to the development of new public services, orienting it to the user, in respect of which the government acts as a whole and takes into account its key needs.

The development strategy of digital government should integrate the departmental systems for rendering state and municipal services within a single portal the infrastructure of which will provide a number of common services, including an identification and authentication system, a payment system, a support for SMS gateways, and the integration of personal data, addresses and contact information (Kirillova et al., 2018). The integration of digital services with the user-orientation within a single portal will help to solve the problem of lack of funds and specialists required for the development of different systems in numerous departments, including regional and municipal levels of government (Ilyina et al., 2019; Polyakova et al., 2018; Koptev et al., 2019; Voronkova et al., 2018a; 2018b; Nagimov et al., 2018).
Thus, the following tasks and recommendations on the development of the digital government of the Russian Federation are formed:

- ✓ it is necessary to force the events and create a program project for the implementation of the digital government of the country until 2021;
- ✓ to build new infrastructure elements for creating a digital space for state and municipal government;
- ✓ to create a more comfortable institutional environment for the operation of the digital space;
- ✓ to accelerate the implementation of the Russian Digital Economy project, including the points regarding interaction and communication between society and the government, as well as between business and the government;
- ✓ to pay a great deal of attention to a solution of the problem of digital inclusion, taking into account the scale of the territory of Russia and its demographic characteristics.

Conclusions

In conclusion, it should be noted that Russia has accumulated quite positive experience in e-government creation, including the interdepartmental information exchange systems – the Unified Interdepartmental Information and Statistical System and the Interdepartmental Electronic Document Management System that facilitate the transition to a more advanced level of information exchange between various government departments. However, the construction of a full-fledged digital government requires a transition to the state sharing infrastructure, launching a unified state cloud platform to provide the services able to improve the quality and security of interaction between departments, provide financial savings by refraining from creating duplicate infrastructures in individual departments or regions. The government can also support the development and implementation of the most popular sharing applications by various government departments on the basis of cloud technologies, supporting the virtualization of workplaces, digital mail and workflow, workflow processes management, infrastructure monitoring etc. Instead of the creation of own systems, the regional government bodies and local governments should be given the opportunity to receive high-quality digital services they need from state cloud resources. Such a system will provide standardized and scalable platforms for the creation of new digital services and, over time, will allow the integration of existing state information systems into a common state resource for computation and data storage. In addition to these services, government cloud resources can become a platform

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for the operation of a wide variety of digital service providers, including the innovative companies that will offer their products and services to the regions and municipalities.

Thus, the development of the digital government of the Russian Federation is a strategically important objective for the current socio-economic growth of our state. Taking into account Russia's current position in the global competitiveness ranking of the digital economy, it is necessary to increase the funding and to allocate the budget funds to create a market infrastructure to support the digitalization of business, public services and management. Moreover, given the increasing demand of the citizens of the country for the provision of services through electronic channels – this indicates the relevance of this problem for society as well. Besides, it is through the creation of a digital government that many institutional and fundamental factors for the development of the shadow sector, corruption and bureaucracy within the government can be solved.

References

A draft digital economy program will be presented at SPIEF. Retrieved from http://fond83.ru/novosti/federalnye-novosti/637-proekt-programmy-tsifrovoj-ekonomiki-rf-budet-predstavlen-na-pmef

Akhmetshin, E. M. 2017. The System of Internal Control as a Factor in the Integration of the Strategic and Innovation Dimensions of a Company's Development. Journal of Advanced Research in Law and Economics, 8(6): 1684-1692. https://doi.org/10.14505/jarle.v8.6(28).03

Andieva, E.Yu, Filchakova, V.D. 2016. Digital economy of the future. Industry 4.0. Applied Mathematics and Fundamental Informatics, 3, 214-218.

Andreeva I.N. State and Municipal Administration: Textbook. Part I, II. M.: Gardariki, 2017. - 652s.

Arkhipova, Z.V. 2016. Transformation of "Electronic Government" into "Digital Government". News of the BSU, 5.

Asaliev, A. M., Zhuravlev, P. V., & Alkhimenko, O. N. (2014). Intellectual capital management as the aspect of upgrading of modern companies management. Life Science Journal, 11(SPEC. ISSUE 11), 363-366.

Baranova I.N. Information technology of public administration. M.: News, 2017. 428p.

Carothers, D. (2018). A culture of equality?. Journal of Culture and Values in Education, 1(2), 42-57. Retrieved from http://cultureandvalues.org/index.php/JCV/article/view/13

Chernopyatov, A., et al. 2018. Entrepreneurship development and business activity in the Russian Federation. Journal of Entrepreneurship Education, 21(4)

Digital Government 2020. Prospects for Russia. Retrieved from http://www.iis.ru/docs/DigitalGovernmentRussia2020RUS.pdf

Dmitrieva, I. S., Sharafutdinov, R. I., Gerasimov, V. O., & Pavlov, S. V. 2017. Method evaluation of the human capital with its innovational potential consideration and perspectives of regional development: The example of the Republic of Tatarstan and Volga Federal District regions. Espacios, 38(40)

Goloshchapova, L. V., Plaskova, N. S., Prodanova, N. A., Yusupova, S. Y., & Pozdeeva, S. N. (2018). Analytical review of risks of loss of profits in cargo transportation. International Journal of Mechanical Engineering and Technology, 9(11), 1897-1902.

Gurieva, L. K., Savicheva, A. N., Kataeva(Sventa Yarvik), V. I., & Norkina, A. N. 2016. Theoretical foundations of management of the organization: Development, types of structures, management methods of control. International Business Management, 10(22), 5406-5416. https://doi.org/10.3923/ibm.2016.5406.5416

Ibatullin, R. R., Gapsalamov, A. R., Vasilev, V. L., & Bakhvalov, S. Y. 2019. Audiovisual aids application in the secondary-level vocational education establishments: efficiency analysis and assessment. International Journal of Educational Management, 33(2), 1-20. https://doi.org/10.1108/IJEM-02-2018-0082

Ibidunni, A.S., et al. 2018. Examining the moderating effect of entrepreneurs' demographic characteristics on strategic entrepreneurial orientations and competitiveness of SMEs. Journal of Entrepreneurship Education, 21(2)

Ilyina, I., Kulibanova, V., & Teor, T. 2019. Special aspects of master data-based integrated management of region reputation in modern IT environment. Paper presented at the IOP Conference Series: Materials Science and Engineering, 497(1) https://doi.org/10.1088/1757-899X/497/1/012022

Kamolov, S. G. 2017. Digital public governance: Trends and risks. Giornale Di Storia Costituzionale, 33(1), 185-194.

Kamolov, S. G., Artemova, P. V., & Berezko, V. E. 2019. Shaping the systems of digital public governance of the digital economy in Russia and abroad. Studies in Computational Intelligence, 826, 435-442. https://doi.org/10.1007/978-3-030-13397-9_51

Kirillova, E. A., Pavlyuk, A. V., Mikhaylova, I. A., Zulfugarzade, T. E., & Zenin, S. S. 2018. Bitcoin, lifecoin, namecoin: The legal nature of virtual currency. Journal of Advanced Research in Law and Economics, 9(1), 119-126. https://doi.org/10.14505/jarle.v9.1(31).16

Koptev V.Yu., Kopteva A.V., Poddubniy D.A. 2019. Increase in Energy Efficiency of Oil and Gas Companies by Perfecting of Management Systems. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus, pp. 548-552. https://doi.org/10.1109/EIConRus.2019.8657041

Korableva, O. N., Kalimullina, O. V., Zaytseva, A. A., & Larionov, A. I. (2018). Elaboration of database for the subject domain of innovation and economic growth potential. Paper presented at the Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020, 6065-6073.

Korableva, O.N., Gorelov, N.A., & Shulha, M.V. 2017. Risk component of innovation management strategy. Paper presented at the Proceedings of the European Conference on Innovation and Entrepreneurship, ECIE, 2017-September 837-843.

Kosorukov, A.A. 2017. Digital government in the practice of modern public administration (on the example of the Russian Federation). Trends and management, 4.

Kosorukov, O. A., & Maksimov, D. A. (2016). Methods of assessing efficiency of wildfire monitoring systems functioning. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 7(6), 517-529.

Kovalenko, K. E., Goloshchapova, L. V., Polyakova, A. G., Erzinkyan, E. A., & Murzagalina, G. M. 2018a. Approaches to social entrepreneurship in russia and foreign countries. Journal of Entrepreneurship Education, 21(Special Issue 2)

Kovalenko, K. E., Ling, V. V., Erzinkyan, E. A., Murzagalina, G. M., & Kolomeytseva, A. A. 2018b. Individual entrepreneurship in russia and abroad: Social and legal aspects. Journal of Entrepreneurship Education, 21(Special Issue 2)

Krasyuk, I. A., Kobeleva, A. A., Mikhailushkin, P. V., Terskay, G. A., & Chuvakhina, A. G. (2018). Economic interests focusing as a basis of the formation of investment policy. Espacios, 39(31)

Kuznetsov, V. S., & Suprun, I. K. (2017). Reduction of an adverse impact during well drilling by means of drilling waste usage. Journal of Ecological Engineering, 18(2), 12-15. https://doi.org/10.12911/22998993/68211

Lebedeva, T. E., Dzagoyeva, M. R., Kobersy, I. S., & Ikoev, S. K. 2016. Corporate governance issues and control in conditions of unstable capital risk. International Journal of Economics and Financial Issues, 6(1S): 25-32.

Leonteva, L. S., Maximov, D. A., Kurbanov, S. A., Afanasyev, I. V., Melnikova, T. E., & Rezakov, R. G. (2018). Information services and development of effective urban management. International Journal of Civil Engineering and Technology, 9(11), 2518-2525.

Melnikov, A.B., Shcherbakov, P.A., Voronkova, O.Y., Mikhaylushkin, P.V., & Poltarykhin, A.L. 2018. Level of development of milk and dairy products market of the federal districts of the Russian Federation. International Journal of Mechanical Engineering and Technology, 9(10), 1214-1219.

Mikhailushkin, P. V., Novoselova, N. N., Shulga, K. V., Kolpak, E. P., & Kabrits, S. A. (2018). Study of the forms and conditions of economic crises in the regional economies of developing countries. Espacios, 39(31)

Mullakhmetov, K. S., & Nazmiev, E. F. 2015. Control in the system of public administration in Russia. International Business Management, 9(7), 1732-1736. https://doi.org/10.3923/ibm.2015.1732.1736

Nagimov, A. R., Slanov, V. P., Shpakova, R. N., Solomonov, M. P., & Il'yaschenko, D. P. 2018. Foresight technologies in the formation of a sustainable regional development strategy. European Research Studies Journal, 21(2), 741-752.

Nechaev, V., Mikhailushkin, P., & Presnyakov, D. (2018). Priorities of social and economic safety. Paper presented at the MATEC Web of Conferences, 212 https://doi.org/10.1051/matecconf/201821204015

Osadchy, E. A. 2015. The intellectual capital importance and the role of organizations against the backdrop of a crisis: Innovation vector. Social Sciences (Pakistan), 10(6), 1013-1020. https://doi.org/10.3923/sscience.2015.1013.1020

Oumlil, R., & Juiz, C. 2018. Acceptance of tourism e-entrepreneurship: Application to educational Balearic Islands context. Journal of Entrepreneurship Education, 21(1)

Perpelyak, A.I., & Salomatina, E.V. 2014. Digital economy: new business opportunities // Scientific community of students of the XXI century. Engineering science: Sat. Art. on mat. LII int. stud scientific-practical conf., 4(51).

Plotnikov, A. V., Kuznetsov, P. A., Urasova, A. A., 2018a. Digital economy: data analysis on the context advertising market in the UK and the US. International Journal of Civil Engineering and Technology, 9(11), 2372-2382.

Plotnikov, A. V., Kuznetsov, P. A., Urasova, A. A., 2018b. Correlation analysis of the data on the UK and US market for contextual advertising. International Journal of Civil Engineering and Technology, 9(11), 1630-1639.

Poltarykhin, A.L., Suray, N.M., Zemskov, Y.V., Abramov, Y.V., & Glotko, A.V. 2018. Food safety in the Russian Federation, its problems with the solutions. Academy of Strategic Management Journal, 17(4)

Polyakova, A. G., Goloshchapova, L. V., Rakhmeeva, I. I., Noeva, E. E., & Rakovskiy, V. I. 2018. A model of regional economic space modernization. European Research Studies Journal, 21(Special Issue 2), 624-634.

Prodanova, N. A., Plaskova, N. S., Bochkareva, N. G., Babalykova, I. A., Gazizyanova, Y. Y., & Zherelina, O. N. (2019a). Integrated Corporate Reporting as An Innovative Business Reporting Model. International Journal of Engineering and Advanced Technology, 8(5), 2075-2078.

Prodanova, N. A., Trofimova, L. B., Adamenko, A. A., Erzinkyan, E. A., Savina, N. V., & Korshunova, L. N. (2019b). Methodology for assessing control in the formation of financial statements of a consolidated business. International Journal of Recent Technology and Engineering, 8(1), 2696-2702.

Sadriev, R. D., & Mullakhmetov, K. S. 2016. Russian business medium: Competition problems. International Journal of Economics and Financial Issues, 6(8Special Issue), 30-38.

Samerkhanova, E., Krupoderova, E., Krupoderova, K., Bakhtiyarova, L., Ponachugin, A., & Kanyanina, T. 2017. Developing an information educational environment based on cloud technologies. Journal of Entrepreneurship Education, 20(3)

Sharafutdinov, R. I., Gerasimov, V. O., Yagudina, O. V., Dmitrieva, I. S., & Pavlov, S. V. 2017. Research of human capital in view of labour potential of staff: National companies case study. Paper presented at the Proceedings of the 29th International Business Information Management Association Conference - Education Excellence and Innovation Management through Vision 2020: From Regional Development Sustainability to Global Economic Growth, 839-852.

Shaytura, S. V., Knyazeva, M. D., Feoktistova, V. M., Vintova, T. A., Titov, V. A., & Kozhaev, Y. P. (2018). Philosophy of information fields. International Journal of Civil Engineering and Technology, 9(13), 127-136.

Smirnova, N.V., & Rudenko, G.V. 2017. Tendencies, problems and prospects of innovative technologies implementation by Russian oil companies. Journal of Industrial Pollution Control, 33(1), 937-943.

Swaramarinda, D.R. 2018. The usefulness of information and communication technology in entrepreneurship subject. Journal of Entrepreneurship Education, 21(3)

Sycheva, I. N., Dunets, A. N., Svistula, I. A., Panteleeva, T. A., & Potashova, I. Y. 2018. Labour relations in research of socio-economic systems. European Research Studies Journal, 21(4): 356-367.

Telyakov, A. N., Petukhov, A. A., Dar'in, A. A., & Telyakov, N. M. (2015). Selective precipitation of manganese in the processing of phosphorus-bearing ferromanganese nodules. Metallurgist, 59(5-6), 466-469. https://doi.org/10.1007/s11015-015-0127-0

The share of citizens using the mechanism of obtaining state and municipal services in electronic form. Retrieved from https://fedstat.ru/indicator/43568

Vasilev, V. L. 2014. The role of information and information technology in the management control function. Biosciences Biotechnology Research Asia, 11(3), 1469-1474. https://doi.org/10.13005/bbra/1540

Voronkova, O. Y., Zadimidcenko, A. M., Goloshchapova, L. V., Polyakova, A. G., & Kamolov, S. G., 2018a. Economic and mathematical modeling of regional industrial processes. European Research Studies Journal, 21(4), 268-279.

Voronkova, O. Y., Sycheva, I. N., Shpakova, R. N., Pashkova, E. Y., & Poltarykhin, A. L. 2018b. Economic mechanism of regulating land relations in the agricultural sector of Russia. European Research Studies Journal, 21(4): 280-291.

Voronkova, O. Y., Iakimova, L. A., Frolova, I. I., Shafranskaya, C. I., Kamolov, S. G., & Prodanova, N. A. (2019). Sustainable development of territories based on the integrated use of industry, resource and environmental potential. International Journal of Economics and Business Administration, 7(2), 151-163.

Widyasthana, G. N. S., Wibisono, D., Purwanegara, M. S., Siallagan, M., & Sukmawati, P. 2017. Corporate venture capital strategy for selecting start-up investments in indonesia using an agent-based model: Cases of a mobile application start-up, payment solution start-up and digital advertising start-up. Journal of Entrepreneurship Education, 20(2)

Yemelyanov, V. A., Fatkulin, A. R., Nedelkin, A. A., Titov, V. A., & Degtyarev, A. V. (2019). Software for weight estimation of the transported liquid iron. Paper presented at the Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus 2019, 381-384. https://doi.org/10.1109/EIConRus.2019.865701

Zagrivnyi E. A., Malarev V.I., Kopteva A.V. 2019. Studying the Operating Mode of the Down-Hole Electrode Heater for the Production of High-Viscosity Oil. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus 2019. Pp. 1110-1113. https://doi.org/10.1109/EIConRus.2019.8656868

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SUSTAINABLE TERRITORIAL DEVELOPMENT BASED ON THE EFFECTIVE USE OF RESOURCE POTENTIAL

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Abstract. The effective use of resource potential is a prerequisite for implementing all the functions of the territory and thus, can be considered fundamental for sustainable territorial development. Within the context of the current crisis in the economic sphere, regional affiliation generally occupies a special place in the structure of socio-economic development. Therefore, finding ways to ensure the effective use of resource potential is a crucial task, combining territorial specifics with the interests of the state. Modern approaches to the organization and management of the resource potential of the territory in the direction of its sustainable strategic development are analyzed. The authors substantiate the conditions and factors of formation of the resource potential of the region. On the basis of a detailed study of the problem, the mechanism developed by the authors to implement the strategy of effective use of resource potential at the regional level is presented. The proposed mechanism can be implemented in the socio-economic management of the territory focused on sustainable development.

Keywords: sustainable development; resource potential; strategy; territory

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1. Introduction

When implementing a strategy of sustainable territorial development, it is important to achieve a balanced solution to the socio-economic task to preserve and increase the efficiency of using resource potential. Stabilization of the socio-economic situation is associated with centralization of decision-making at the territorial level, as well as the willingness and ability of territories to provide targeted and effective use of all available resources.

The analysis of the concepts of "sustainable development" and "resource potential" suggests that sustainable development of regions with natural-resource specialization implies the efficient use of their natural (and geographical) competitive advantages in the socio-economic development of the Russian Federation.

The broad interpretation of the term "potential" allows applying it in various branches of science and practice, depending on the type of resource, its reserves, and sources. The presented scientific term encompasses two aspects: resource availability and its targeted use. Furthermore, the potential is a combination of all available factors of production, intelligence, production reserves and opportunities that can ensure the release of high-quality and in-demand goods and services necessary to meet the comprehensive needs of various categories of consumers (Alferova, 2015; Isyanbaev, 2016; Poltarykhin et al., 2018; Rozenberg, 2005).

At the same time, the potential is not only the amount of a certain resource but also the possibility of developing the system in a given direction, as well as its effective use. Thus, the potential should be understood as a set of funds and reserves of a certain territorial resource, the use of which allows achieving the economic effect. The World Conservation Strategy, presented in 1980 by the International Union for Conservation of Nature and Natural Resources, emphasized that sustainable development requires considering not only economic aspects but also social and ecological ones. In the 1980s, the issue of the relationship between ecology and social development was particularly actively discussed in the global scientific community (Korableva et al., 2018; Gusev, 2013; Danilov-Danilian, 2003; Dokholyan, 2011; Mishenin et al., 2018; Kolesova, 2015). Later, it was replaced by the concept of "eco-development", meaning environmentally friendly development, that is, development that has the least negative impact on the environment.

Most of the international organizations of the UN system have incorporated the substantial environmental component into their activities, oriented towards the transition to sustainable development. The World Bank experts have identified sustainable development as a process of managing a collection (portfolio) of assets aimed at preserving and expanding people's opportunities (Podprugin, 2012; Pavolová et al., 2019; Shumakova et al., 2016; Mikhailushkin et al., 2018). The assets in this definition include not only traditionally considered financial and material capital but also natural and human capital.

2. Methodology

The study is based on the study of sustainable development based on the integrated and effective use of territorial resource potential, the formation of organizational and economic relations of sustainable development, including through the mechanism for achieving the goals of sustainable territorial development through the effective use of resource potential. To achieve the objectives of the study, the authors used a critical analysis of literary sources, as well as general scientific methods – the system approach, the methods of analogies, abstract, logical, monographic, statistical and economic methods. The system approach served as a methodological basis, which allowed ensuring the complexity and focus of the study.

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3. Results and Discussion

Synthesizing the existing approaches to understanding the category of "sustainable development" allows distinguishing two major interpretations of this concept. The first one focuses attention mainly on the environmental component, which is reflected in the optimization of the territory's activity towards the biosphere. The second one implies a new type of territorial development based on significant changes in its historically established parameters: economic, social, ecological, tourist and recreational, cultural, etc. Thus, the "concept of sustainable territorial development" is multidimensional and consists of several interrelated aspects, including:

- the economic aspect directs the territory's production and economic activity not to the increase in consumption of natural resource potential, but to its effective use;
- the social aspect implies an increase in the earned income of the population by reducing poverty and improving the quality of life in the region;
- the environmental aspect assumes a strict regulation of environmental management and environmental protection;
- the cultural aspect determines the set of historically established characteristics of the territory and national composition of the population;
- the prognostic aspect is associated with considering not only the current sustainable development strategy but also the assessment of long-term planning dynamics.

Russia's transition to sustainable development was presented by the Government of the Russian Federation and approved by the decision of the President of the Russian Federation in April 1996. The concept involves the formation of the effective spatial structure of the country's economy while respecting the balance of interests of all subjects of the Russian Federation (Sycheva et al., 2017; Voronkova et al., 2018; Telyakov et al., 2016; Ivanova et al., 2018). The analysis of the presented concept shown that considered attention is paid to the regional aspect, justified the possibility of transition to sustainable development of the Russian Federation under the condition of sustainable development of its territories (Fedorinin and Zhuravlev, 2002; Nechaev et al., 2018a,b). We believe that this is possible only in the formation of an effective spatial structure of the country's economy and the balance of interests of all subjects of the Russian Federation.

The process of transition of the regional economy to sustainable development is associated with its stabilization, which, based on the research methodology, is objectively related, on the one hand, to the general content of the ongoing economic transformations in the country, and on the other hand, to the objective socio-economic situation in a certain territory. The implementation of this process should be based on the economic reality of the territory; it is important to consider the potential of this territory, its socio-economic specifics, and cultural characteristics. Therefore, the major methodological principles for the study of sustainable development of the territory are the following:

- the principle of unity of the territory's economic development and the process of the national economy reformation;
- the principle of a single financial and economic space of the state in implementing economic development at the territorial level;
- the principle of diversity in implementing sustainable development of the territory.

When using natural resources in production, in some cases economists proceed from the concept called "The Theory of Three Factors", where each production factor is considered a separate source potentially contributing to income growth (Kovalenko, 2012; Malarev et al., 2018; Makar, 2015; Asaliev et al., 2014; Mikhailushkin et al., 2018). So, invested capital brings interest, labor – produced goods, land – product and rent. The interchangeability of resources helps to reduce the scarcity of certain types of raw materials, which are often dependent on each other. Modern economics provides opportunities for accounting for various alternative solutions differentiating in capital intensity of mining and development, the service life of raw materials sources and return on investments, as well as the assessment of environmental damage.

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Definition of conditions, factors, and prerequisites for sustainable territorial development is closely linked to the assessment of its resource and environmental potential. The value of the natural resource potential as the sum of potentials of individual types of territory's natural resources (land, water, forest, mineral resource base) depends on the following factors:

- the list of available natural resources (the more resources to be used in the production process, the higher the level of resource potential) (Petukhov et al., 2017; Aleksandrova et al., 2019; Gulkov et al., 2019);
- quantitative characteristics of certain types of resources (value of stocks, share, and terms of their exhaustion);
- qualitative characteristics (the content of useful substance, caloric value, availability);
- the possibility of the systematic use of resources.

One of the major activities of regional authorities and local governments is the rational use of primary and secondary resources, the restoration of renewable natural resources, improving the quality of environmental components and residential security in the territory.

Currently, there is no consensus on the (Goloshchapova et al., 2018). At the same time, despite the enormous achievements of science and technology, the primary types of natural resources in Russia remain solar energy, internal heat, water, land, mineral, plant and animal resources. Depending on the state and level of productive forces development, nature is affected by society, which, objectively, can be both positive and negative.

A number of scientists, analyzing the strategy of socio-economic development of the Russian Federation, note that sustainable territorial development on the basis of resource potential involves improving the efficiency of the use of territorial resources (Yarlykapov, 2013; Shedko, 2015; Darin and Telyakov, 2017; Koptev et al., 2018; Usmanova, 2014), namely:

- ensuring the legal framework for the production and natural complexes in the territory;
- preserving natural resource potential and improving the ecological condition of the territory;
- organizing complex environmental monitoring;
- developing a methodological framework for environmental regulation and environmental auditing.

Therefore, the study of the regional natural resource potential is a prerequisite for creating an effective management system in the national economy. The quantitative and qualitative characteristics of natural resources determine the specialization of different economic regions, the prospects for their infrastructure development, as well as the capacity and spatial dimensions of local markets.

The most effective use of the resource potential is of great importance for the stable territorial development of territories. The importance of strategic resource management for a territory results from the fact that it is the resources of various types that underlie the creation of such important elements of national wealth as fixed assets. Furthermore, the resources are directly involved in shaping the characteristics of socio-economic territorial development (Shatunova et al., 2019), which include the gross domestic product, the amount of investment attracted to this territory, the high standard of living and employment.

The resources are a multifaceted category, including all factors of activity (tangible and intangible), which allow the territory to perform any activities within the framework of a predetermined development strategy (Vinogradova, 2013; Prodanova et al., 2019a; Yemelyanov et al., 2018; Sharafutdinov et al., 2019; Nagimov et al., 2018; Amraoui et al., 2019). The resource potential is the possibility of using the resources available in a given territory to obtain any beneficial effects. When developing a sustainable development strategy based on the resource potential of a territory, it is necessary to consider that its natural, climatic, economic, informational, infrastructural, socio-cultural, demographic and other conditions have been formed and acted in the territory for a long period of time and therefore, largely determine its current state and territorial development trends.

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Each territory has its own specific list of resources; however, not all the resources of a given territory have equal importance or potential for ensuring sustainable competitive advantages to this territory. To achieve a territorial competitive advantage, the most important are those resources that are endowed with such features as uniqueness, rarity, and the impossibility of substitution. In our opinion, the resource provision of sustainable development of the territory should be controlled by the authorities in the appropriate form and based on clear resource strategies that contribute to the solution of the following tasks (Figure 1).

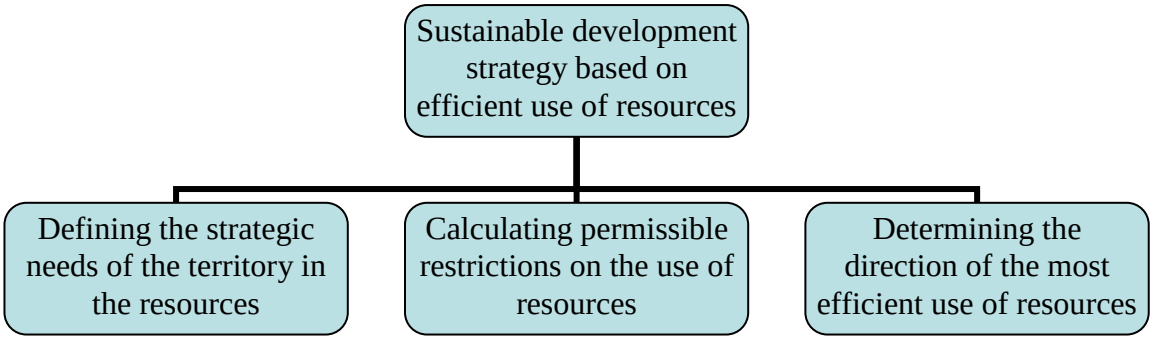

Fig. 1. Resource strategy for sustainable territorial development
Source: own research

The achievement of organic interconnection and integration of numerous functional types of production activities developed in this territory (trade, production, tourism) into a single cross-sectoral management system is a characteristic feature of modern approaches to organization and management of territorial resources. The modern approach to improving the efficiency of the region's resource potential implies building a resource strategy basis on studying its competitive position with respect to its internal uniqueness. At the same time, an important emphasis should be placed on defining the characteristics of a resource that allows generating sustainable competitive advantages of the territory. Such a resource must form an economic value, be quite rare, difficult to imitate and difficult to access in the market of production factors (Pikulkin, 2010; Polushkina, 2012; Pavlyuk et al., 2018; Dzhavatov et al., 2018; Prodanova et al., 2019b; Dalevska et al., 2019).

The use of resource concept towards sustainable development of the territory is based on systemic imperatives:

- there are persistent systemic differences in the implementation of control over the resource required for the implementation of the territorial development strategy;
- the difference between the types of resources of a particular territory leads to the formation of differences in the socio-economic results acquired by the territory compared to competing territories;
- each territory tries to increase or maximize these results.

To implement the mechanism of effective use of the territory's resource potential to achieve the goals of sustainable development, the authors suggest systematizing its resources into four groups (Robertson, 2014):

- strategically important strengths;
- strategically important weaknesses;
- strategically not important strengths;
- strategically not important weaknesses.

For each group, it is necessary to formulate rules indicating the efficient use of resources and abilities of the territory. These rules are formalized by the executive authorities in the form of strategic priorities within the system of territorial management. With a shortage of resources, their limited nature, high cost or unavailability at

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the territorial level, it becomes important to consider the resource supply of each element of the territorial development strategy (Polyakova et al., 2018).

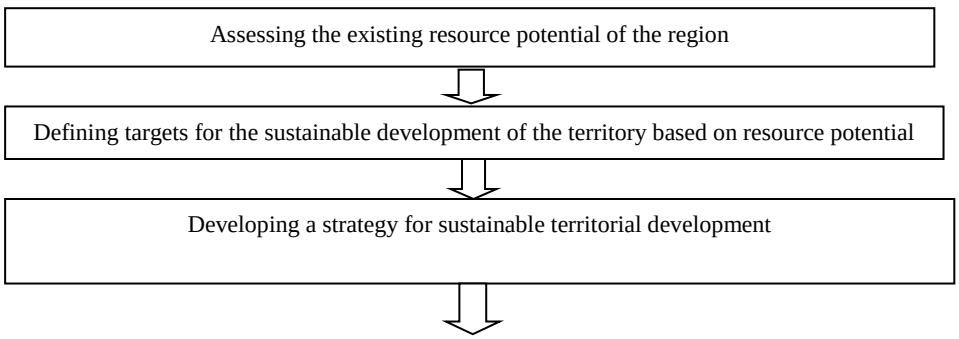
It is necessary to remember that the limited resources are constantly increasing, which increases the urgency of the most efficient use of the territory's resource potential. The resource utilization plan must be balanced, clear and logical to ensure the optimal use of the limited resources of the territory. The choice of specific criteria and indicators requires the availability of methods for their formation, considering the characteristics of each specific territory.

Improving the management system of the territory's resource potential requires efforts from both state authorities and local governments. Thus, the effective management of the territory's resource potential is an important task of the territory's socio-economic development, as well as the most important component of the territorial policy. Given the limited budget and other material and financial resources, the territory's inner resource potential can be considered the main resource of territorial development. The search for the most efficient use, further preservation, and an increase of the territorial resource potential is one of the key priorities for the local executive authorities and local governments.

The strategy of strengthening the territorial resource potential and increasing its efficiency involves:
- formation of management, socio-economic, legal and regulatory environment for the implementation of principles of sustainable territorial development;
- developing entrepreneurship, mainly small and medium-sized businesses as the key factor of socio-economic territorial development;
- strengthening the economic integration of the territory through a more efficient realization of its competitive advantage in the form of a unique resource potential;
- promoting active development of the personnel potential through social and demographic stabilization, the achievement of productive employment, and the development of social infrastructure;
- improving the complex of environmental measures and more efficient use of the territory's natural resources.

The main activities of federal and local authorities in the strategy of sustainable development of the territorial resource potential should involve expanding the sectoral specialization of the economy, creating technologically equipped processing enterprises in the territory, cleaner production, developing transport and market infrastructure in the territory, promoting entrepreneurship, implementing innovation policy, ensuring effective management of the territory's infrastructure.

Ensuring the comprehensive human resource development of the territory requires the formation of a set of measures for this direction of development. Among these measures, one can mention the development of social programs aimed at solving the labor problems of the territory (providing employment, creating new jobs, financing the education, health care, social protection and culture sectors) (Ilyina et al., 2019; Korableva et al., 2019; Voronkova et al., 2019; Krasyuk et al., 2018). In the modern world of innovation and rapid technology development, it is also necessary to consider the intangible resources of the territory.



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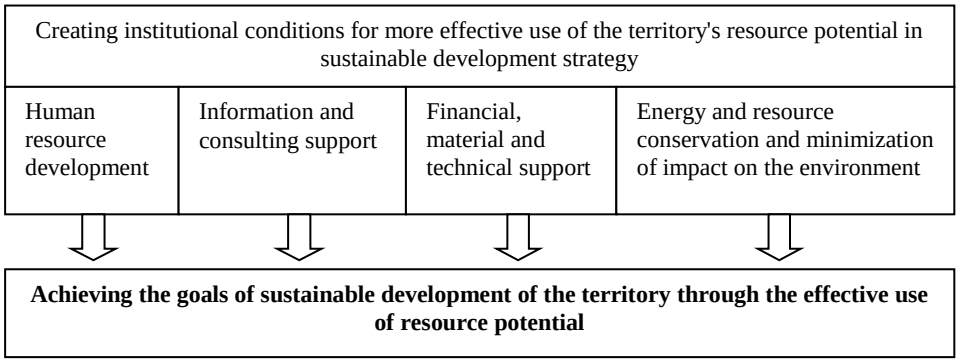

Fig. 2. The mechanism for achieving the goals of sustainable development of the territory through the effective use of resource potential
Source: own research

Based on the study of scientific materials on the research topic, it can be concluded that the results of sustainable territorial development depend on many factors, the analysis and evaluation of which is carried out using a systematic approach and system analysis. Initially, the results depend on the quantitative and qualitative characteristics of territorial resources, technologies, internal and external factors. Therefore, the effective use of the resource potential of the territory is an objective condition for the implementation of all functions of the territory and can be considered an essential prerequisite for sustainable territorial development. According to the authors of the article, the implementation of this approach takes place within the framework of the resource concept aimed at the effective implementation of the resource potential of the territory in the conditions of fierce market competition between the territories for strategically important partners, as well as consumers and tourists. Mechanism for achieving the goals of sustainable development of the territory on the basis of effective use of resource potential.

The conditions for the formation of resource potential imply the state of productive forces of society, including natural factors, equipment, and technologies, as well as the educational and qualification competencies of people for their effective use, within a specific territory. The main conditions, varying in different federal districts and regions, include the level of GDP production; the level of real incomes of the population; the volume of investment in the economy, etc. The prerequisites for the effective use of resource potential include the extent to which territorial resources are used correctly and scientifically and how the potential of strategic production is ensured.

The factors forming the economic potential of the region are the key resources of productive activities (land, labor, capital, and entrepreneurship), and the driving force of economic and production processes affecting the result of production and economic activity. The factors affecting labor productivity include the level of remuneration, labor organization, employee training, and technical perfection of production tools.

In general, the regional factors include the economic and geographical location of the territory, its population and labor resources, the industrial complex of the territory, the infrastructure, localized natural resources (energy, mineral, biological, water), transport infrastructure, scientific and technological potential, and other factors.

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Conclusion

Sustainable development of territorial production largely depends on the resource potential, which includes the territory's geopolitical situation, its socio-political conditions and development factors; natural potential (water, forest, land and mineral resources); demographic and labor potential; production potential (the material and technical base of the territory and financial resources for its development); social potential (health care, education, housing and municipal services, trade, public catering). In most of the socio-economic indicators in the strategies of sustainable development of the Russian territories, the authors revealed noticeable discrepancies caused by differences in the available territorial resources and efficiency of their use. The processes of rapprochement in sustainable territorial development are not automatic; therefore, without an effective regional strategy and policy, it is impossible to mitigate the existing differentiation in terms of the key production indicators of the territory and in terms of development and well-being of its population.

The availability of basic resources of a certain territory is often limited by circumstances of both objective and subjective nature. Modern industrial enterprises generally face a shortage of water, land and mineral resources, energy, and skilled workers. Sustainable development of territorial production is also associated with the effective use and strengthening of its material and technical base, which is one of the crucial components of territorial resource potential in sustainable development strategies.

References

Alferova T.V. 2015. Conceptual modeling of the category of «sustainable development». Journal of Economic Theory, 4, 46-52. file:///C:/Users/Manuela/Downloads/Sustainable%20Development%20of%20Territories%20Based%20on%20the%20Integrated%20Use%20of%20Industry,%20Resource%20and%20Environmental%20Potential.pdf

Aleksandrova T. N., Nikolaeva N. V., Lvov V. V., Romashev A. O. (2019) Ore processing efficiency improvements for precious metals based on process simulations. Obogashchenie Rud, (2), 8–13. https://doi.org/10.17580/or.2019.02.02

Amraoui, B., Ouhajjou, A., Monni, S., El Amrani El Idrissi, N., Tvaronavičienė, M. (2019). Performance of clusters in Morocco in the shifting economic and industrial reforms. Insights into Regional Development, 1(3), 227-243. https://doi.org/10.9770/ird.2019.1.3(4)

Asaliev, A. M., Zhuravlev, P. V., & Alkhimenko, O. N. (2014). Intellectual capital management as the aspect of upgrading of modern companies management. Life Science Journal, 11(SPEC. ISSUE 11), 363-366.

Dalevska, N., Khobta, V., Kwilinski, A., Kravchenko, S. (2019). A model for estimating social and economic indicators of sustainable development. Entrepreneurship and Sustainability Issues 6(4): 1839-1860. http://doi.org/10.9770/jesi.2019.6.4(21)

Danilov-Danilian V.I. 2003. Sustainable development. Theoretical and methodological analysis. Economics and Mathematical Methods, 8 (24), 123-135.

Dzhavatov, D. K., Sverdlikova, E. A., Sokolov, M. S., Avdeeva, O. A., & Yavkin, G. P. (2018). The influence of innovation on social and economic development of the Russian regions. European Research Studies Journal, 21(Special Issue 2), 767-776.

Darin, A. A., & Telyakov, N. M. (2017). Processing of ferromanganese concretions with the use of sulfatising roasting. Journal of Engineering and Applied Sciences, 12(5), 1113-1115.

Dokholyan A. S. 2011. Problems of sustainable development of the region's economy. Modern problems of science and education, 5, 25-31.

Fedorinin, V. N., & Zhuravlev, P. V. (2002). New developments of optopolarization sensor devices and articles based on them. Paper presented at the Proceedings of SPIE - the International Society for Optical Engineering, 4900(2) 982-987. http://doi:10.1117/12.484491

Goloshchapova, L. V., Plaskova, N. S., Prodanova, N. A., Yusupova, S. Y., & Pozdeeva, S. N. (2018). Analytical review of risks of loss of profits in cargo transportation. International Journal of Mechanical Engineering and Technology, 9(11), 1897-1902.

Gulkov Yu.V., Turysheva A.V., Kopteva A.V. 2019. Research of Grounding Systems of Electrical Complexes in the Conditions of Permafrost Soils. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus, pp. 969-972. https://doi.org/10.1109/EIConRus.2019.8657119

Gusev Yu. N. 2013. Sustainable development through the prism of corporate social responsibility. Economic systems, 2, 2-4.

Ilyina, I., Kulibanova, V., & Teor, T. (2019). Special aspects of master data-based integrated management of region reputation in modern IT environment. Paper presented at the IOP Conference Series: Materials Science and Engineering, 497(1). https://doi.org/10.1088/1757-899X/497/1/012022

Isyanbaev M. N. 2016. Sustainable development of regional socio-economic systems: directions, mechanisms. Humanitarian research, 12, 12-16.

Ivanova, V. N., Atyukova, O. K., & Poltarykhin, A. L. (2018). Prerequisites of growth of investment and social attractiveness of the regions of Russia within the framework of implementation of the public-private partnership projects. International Journal of Mechanical Engineering and Technology, 9(11), 2299-2305.

Kolesova Yu. N. 2015.Strategy of sustainable development of rural areas. Young scientist, 8, 392-394.

Koptev V.Yu., Kopteva A.V., Poddubniy D.A. 2019. Increase in Energy Efficiency of Oil and Gas Companies by Perfecting of Management Systems. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus, pp. 548-552. https://doi.org/10.1109/EIConRus.2019.8657041

Korableva, O., Durand, T., Kalimullina, O., & Stepanova, I. (2019). Usability testing of MOOC: Identifying user interface problems. Paper presented at the ICEIS 2019 - Proceedings of the 21st International Conference on Enterprise Information Systems, 2 468-475.

Korableva, O. N., Kalimullina, O. V., Zaytseva, A. A., & Larionov, A. I. (2018). Elaboration of database for the subject domain of innovation and economic growth potential. Paper presented at the *Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020,* 6065-6073.

Kovalenko E. G. 2012. Problems and mechanisms of development of rural territories. Fundamental research, 3-3, 687-690.

Krasyuk, I. A., Kobeleva, A. A., Mikhailushkin, P. V., Terskay, G. A., & Chuvakhina, A. G. (2018). Economic interests focusing as a basis of the formation of investment policy. Espacios, 39(31)

Malarev V.I., Kopteva A.V., Koptev V.Yu. (2018). Electric Power Supply System Development for Down-hole Electric Steam Generators to Produce High-viscosity Oil. International Multi-Conference on Industrial Engineering and Modern Technologies, FarEastCon. https://doi.org/10.1109/FarEastCon.2018.8602954

Makar S. V. 2015. To the question of the pole of development of the region's potential. Pskov regional journal, 24 (24), 12-22.

Mikhailushkin, P. V., Lubkova, E. M., Shilova, A. E., Zhuravlev, P. V., Karpenko, E. Z., & Nikiforov, S. A. (2018). Possibilities of agriculture competitiveness increasing. International Journal of Mechanical Engineering and Technology, 9(11), 1401-1412.

Mikhailushkin, P. V., Novoselova, N. N., Shulga, K. V., Kolpak, E. P., & Kabrits, S. A. (2018). Study of the forms and conditions of economic crises in the regional economies of developing countries. Espacios, 39(31)

Mishenin, Y.; Koblianska, I.; Medvid, V.; Maistrenko, Y. 2018. Sustainable regional development policy formation: role of industrial ecology and logistics, Enterpreneurship and Sustainability Issues 6(1): 329-341. http://doi.org/10.9770/jesi.2018.6.1(20)

Nagimov, A. R., Slanov, V. P., Shpakova, R. N., Solomonov, M. P., & Il'yaschenko, D. P. (2018). Foresight technologies in the formation of a sustainable regional development strategy. European Research Studies Journal, 21(2), 741-752.

Nechaev, V., Mikhailushkin, P., & Alieva, A. (2018a). Trends in demand on the organic food market in the european countries. Paper presented at the *MATEC Web of Conferences, 212* http://doi:10.1051/matecconf/201821207008

Nechaev, V., Mikhailushkin, P., & Presnyakov, D. (2018b). Priorities of social and economic safety. Paper presented at the MATEC Web of Conferences, 212 http://doi:10.1051/matecconf/201821204015

Pavlyuk, A. V., Hasanov, E. L., Sverdlikova, E. A., & Kadyrov, M. A. (2018). Institutional mechanisms for implementation of entrepreneurial potential of the population of the region. Journal of Applied Economic Sciences, 13(7), 2052-2075.

Pavolová, H., Bakalár, T., Emhemed, E. M., Hajduová, Z., Pafčo, M. 2019. Model of sustainable regional development with implementation of brownfield areas, Entrepreneurship and Sustainability Issues 6(3): 1088-1100.

Petukhov, A. A., Dar'in, A. A., & Telyakov, N. M. (2017). Processing of ferromanganese nodules of the Pacific Ocean. Metallurgist, 61(5-6), 439-443. https://doi.org/10.1007/s11015-017-0514-9

Pikulkin A.V. 2010.The system of government administration. - Moscow: UNITY-DANA, 639.

Podprugin M. O. 2012. Sustainable development of the region: the concept, the basic approaches and the factors. Journal of Russian entrepreneurship, 24, 214-221.

Poltarykhin A.L., Alekseev A.E., Kudryavtsev V.V., Makhanova T.A., Voronkova O.Yu., Aydinov H.T. 2018. Prospects for the Development of the Green Economy of Russian Federation. European Research Studies Journal Volume XXI, Issue 4, pp. 470-479.

Polushkina T. M. 2012. Formation of a rational system of state regulation of agrarian sector of economy meeting the requirements of cost-effective agricultural policy. Basic research, 9-4, 976-980.

Polyakova, A. G., Goloshchapova, L. V., Rakhmeeva, I. I., Noeva, E. E., & Rakovskiy, V. I. (2018). A model of regional economic space modernization. European Research Studies Journal, 21(Special Issue 2), 624-634.

Prodanova, N. A., Trofimova, L. B., Adamenko, A. A., Erzinkyan, E. A., Savina, N. V., & Korshunova, L. N. (2019a). Methodology for assessing control in the formation of financial statements of a consolidated business. International Journal of Recent Technology and Engineering, 8(1), 2696-2702.

Prodanova, N. A., Plaskova, N. S., Bochkareva, N. G., Babalykova, I. A., Gazizyanova, Y. Y., & Zherelina, O. N. (2019b). Integrated Corporate Reporting as An Innovative Business Reporting Model. International Journal of Engineering and Advanced Technology, 8(5), 2075-2078.

Robertson St., Blackwell B. 2014. Lifecycle Planning and Enduring Value for Remote communities. International Journal of Rural Law and Policy, 1, 1 – 11.

Rozenberg N.V. 2005. Socio-cultural component of the concept «region». Analytics of cultural science, 2(4), 34-43.

Sharafutdinov, R. I., Polyakova, A. G., Gerasimov, V. O., Shpakova, R. N., & Mikhailova, M. V. (2019). Inclusive growth: A dataset on key and institutional foundations for inclusive development of Russian regions. Data in Brief, 23. https://doi.org/10.1016/j.dib.2019.103864

Shatunova O., Anisimova T., Sabirova F., Kalimullina O. (2019) STEAM as an Innovative Educational Technology. Journal of Social Studies Education Research, 10 (2), 131-144.

Shedko Yu. N. 2015. A set of mechanisms for managing sustainable development of regions. Economics and management: problems, solutions, 8(44), 92-97.

Shumakova, O., Poltarykhin, A. L., & Mozzherina, T. G. (2016). Import substitution as the basis of solving problem related to food safety of the russian federation. International Journal of Applied Business and Economic Research, 14(9), 5911-5920.

Sycheva, I.N., Ovchinnikov, Y.L., Permyakova, E.S., Voronkova, O.Yu. 2017. Organic Production at Long-fallow Lands as a Strategic Resource of the Food Import Substitution Policy. Revista Espacios, 38(33), 40.

Telyakov, N. M., Darin, A. A., Telyakov, A. N., & Petukhov, A. A. (2016). Influence of the specific character of the content of iron-manganese concretions of the Pacific Ocean and Baltic Sea on technological indicators of valuable component extraction. Tsvetnye Metally, (2), 40-45. https://doi.org/10.17580/tsm.2016.02.06

Usmanova T. H. 2014. Modern requirements of formation of strategy of social and economic development of regions. Economy. Business. Banks, 2(7), 23-36.

Vinogradova K. O. 2013. The essence and structure of the development potential of the region. Modern problems of science and education, 3(18), 17-25.

Voronkova, O. Y., Akhmetshin, E. M., Sycheva, I. N., Shpakova, R. N., Pashkova, E. Y., & Poltarykhin, A. L. 2018. Economic mechanism of regulating land relations in the agricultural sector of Russia. European Research Studies Journal, 21(4), 280-291.

Voronkova, O. Y., Iakimova, L. A., Frolova, I. I., Shafranskaya, C. I., Kamolov, S. G., & Prodanova, N. A. (2019). Sustainable development of territories based on the integrated use of industry, resource and environmental potential. International Journal of Economics and Business Administration, 7(2), 151-163.

Yarlykapov A. D. 2013. Assessment of regional development forecasting options. Regional economy, 2 (34), 23-31.

Yemelyanov, V., Tochilkina, T., Nedelkin, A., & Shved, E. (2018). Automation of monitoring and diagnosing the technical condition of torpedo ladle cars. Paper presented at the MATEC Web of Conferences, 239 https://doi.org/10.1051/matecconf/201823904003

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CORRUPTION AS AN OBSTACLE TO SUSTAINABLE DEVELOPMENT: A REGIONAL EXAMPLE

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Abstract. Corruption in various sectors causes serious damage not only to individual economies, countries, and regions but also to humanity as a whole. This paper analyzes the state of corruption in the Republic of Tatarstan, the manifestations of which restrain the development of the Republic, and presents the results of a pilot sociological study that demonstrate changes in the perception of problems of corruption in society. The sustainable development of a region is influenced by various economic and social factors. The results of this research show that one of these factors is corruption, which is often used as a tool for managing territories at various levels. It is a serious obstacle to the achievement of continuous sustainable development of a region, as it impedes the building of harmonious relations between state, government, society, and business. Sustainable development of a region can be described as a system and as a process. In this study, "sustainable development" refers to the process in which various stakeholder interactions take place that influence the established order of relations in the region. The findings suggest that when assessing the effectiveness of a region's sustainable development, the level of corruption should be considered as an indicator of its stability. Some measures were proposed to improve the organization of anti-corruption work in the Republic of Tatarstan for leveling social tensions in society.

Keywords: corruption, sustainable development, obstacle, Russia, Tatarstan

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1. Introduction

Recently, research has focused on the sustainable development of territories and the influence of various factors on it (Baklanov, 2014; Malyutina, 2015; Ponomareva et al., 2019; Sasongko et al., 2018; Tvaronavičienė, 2018; Zeibote et al., 2019). For a long time at the global level, there has been an integrative influence of various socio-economic problems on the sustainable development of territories. Sustainable development of a region is aimed at such development, which levels social tensions in society, sufficiently satisfies its needs, and ensures the stable economic growth of the territory. Corruption is one of the main social factors impeding the sustainable development of a territory.

The relevance of the study is due to changes in public perceptions about the role and causes of corruption, its development, and manifestations, as well as an assessment of the effectiveness of measures in the implementation of anti-corruption policy in Tatarstan. A number of authors (Asaliev et al., 2014; Badrutdinov and Rakhimov, 2013; Yeparkhina, 2013; Kochurova, 2017; Lipatov et al., 2017; Nagimov and Nagimov, 2015; Poltaradneva and Goverdovskaya, 2014; Savchenko et al., 2018; Papakostas, 2016) point to the need to measure the level of corruption among the population, the importance of anti-corruption monitoring (Kabanov, 2012; Pankratov, 2011; Saltykova, 2018; Feschenko, 2014; Shumakova et al., 2016), pay attention to corruption in various authorities and spheres of activity and anti-corruption measures (Vlasenko, 2015; Volkonskaya, 2018; Garipov et al., 2014; Golubovsky and Sinyukova, 2015; Dyatlov and Isakova, 2018; Eli, 2016; Kochurova, 2017; Temnikov, 2017; Frolova and Bibarsova, 2017; Chaldayeva et al., 2014; Luzgina 2017). Special attention should be paid to the works of researchers of the case study of the Republic of Tatarstan (Badrutdinov and Rakhimov, 2013; Garipov et al., 2014; Kochurova, 2017; Pankratov, 2011; Temnikov, 2017).

At first glance, the terms “sustainable” and “development” can be interpreted as bipolar definitions. Thus, sustainability implies some kind of stability or constancy, and “development” indicates a change or a process. Therefore, the symbiosis of definitions of “sustainable development” is interpreted as a constant change and continuous improvement (today is better than yesterday, and tomorrow is better than today). In this regard, sustainable development should be considered as a basis in territorial management strategies (Pavlyuk et al., 2018; Voronkova et al., 2019; Prodanova et al., 2019a; Goloshchapova et al., 2018; Fedorinin and Zhuravlev, 2002; Ivanova et al., 2018).

In order to assess the state of corruption in the Republic of Tatarstan, a pilot study was conducted in which 400 respondents aged from 19 to 65 took part, including: from 19 to 29 – 27.5%; from 30 to 39 – 23.25%; from 40 to 49 – 27.75%; over 50 – 21.5%. Most of the respondents are women (68.25%).

Object of study: the attitude of the population of the Republic of Tatarstan toward various manifestations of corruption and the assessment by the society of the measures that are being taken to combat corruption in the Republic of Tatarstan.
The subject of the study is corruption as a factor of obstacles to the sustainable development of the region.
Objectives of the study:
1. To conduct a review of scientific research on the problem of corruption and sustainable development of territories.
2. To analyze the results of the questionnaire survey on the causes of corruption crimes, the degree of corruption of officials in various fields, the attitude of the population to the manifestations of corruption in the Republic of Tatarstan, to interpret the research results.
3. Formulate conclusions and develop recommendations for improving the organization of anti-corruption work in the Republic of Tatarstan to ensure the sustainable development of the region.
The following hypotheses are put forward:

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- various manifestations of corruption together have a serious impact on the sustainable development of the region, the growth of social tension in society and the negative perception of anti-corruption measures;
- increasing the level of anti-corruption education and changing the anti-corruption behavior of the population of the Republic of Tatarstan.

The research results are of an applied nature and can be used as the basis for the development of a separate region development strategy, as well as programs of interaction between civil society institutions and authorities on anti-corruption education and anti-corruption issues to ensure sustainable development of the territory and leveling social tension.

2. Literature review

Corruption is always a companion of new regimes, so the article (Barsukova, 2019) traces the transformation of informal relations between the state and big business due to changes in the financial and administrative capabilities of the state, and compares the situations of the 1990s, 2000s and 2010s. However, corruption is a problem in many countries (Pujiyono et al., 2019; Campbell, 2018; Denkers, 2018; Naushad et al., 2018; Kordík and Kurilovská, 2018; Osipov et al., 2018; Petukhov et al., 2017; Batzilis, 2019). Of particular interest is a study of China's experience that measures the impact of anti-corruption efforts on public perceptions of corruption and trust in government (Zhang et al., 2019; Gulkov et al., 2019). Based on data from twelve Chinese provinces, anti-corruption efforts, public perceptions of corruption, and government credibility are used as variables in the empirical framework, and then analyzed with a detailed discussion of the impact of the fight against corruption. The results show that public perception of corruption affects the attitude to the authority of the government, anti-corruption efforts mitigate the damage in public confidence in the central government, but do not significantly reduce the damage in trust to the provincial governments. Based on the results, three political consequences emerge: (1) anti-corruption efforts should be further improved as an important method of maintaining the health of the ruling party and as a method of winning public support (Prodanova et al., 2019b; Sharafutdinov et al., 2019); (2) the government should increase diversification of efforts to curb corruption, introduce innovative anti-corruption mechanisms (Zhuravlev et al., 2018; Mullins, 2019; Korableva et al., 2019; Ige, 2019; Ilyina et al., 2019) and increasing public participation in anti-corruption efforts, and (3) measures to combat corruption should be strengthened.

3. Methods

The study was conducted by a questionnaire survey in various cities of the Republic of Tatarstan. The questionnaire included 29 questions aimed at studying and analyzing the causes of corruption crimes, the degree of corruption of officials in various spheres, the public attitude toward corruption, and public assessment of the measures taken to combat corruption in the Republic of Tatarstan.

Sampling for the questionnaire survey consisted of two stages. At the first stage, four settlements in the Republic of Tatarstan were selected: Kazan, Naberezhnye Chelny, and Almetyevsk as the largest cities in terms of population, and for comparison – Nizhnekamsk, as the youngest city in the Republic. Then there was a sampling of respondents based on traditional selection criteria: age and gender, as well as the employment status (student, employed, unemployed). The pilot survey was conducted in large shopping centers. The method of data collection was based on the willingness of respondents to independently answer all the questions of an anonymous questionnaire on the research problem. The collection of survey data made it possible to process and systematize the information received. In the processing of empirical data, the authors used the methods of typology, ranking, grouping, and comparative analysis.

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4. Data Collection

The empirical basis of the study was a secondary analysis of research data on corruption and sustainable development, as well as the results of own sociological research.

The sample survey consisted of 400 respondents aged from 19 to 65 years, including: from 19 to 29 – 27.5%; from 30 to 39 – 23.25%; from 40 to 49 – 27.75%; over 50 – 21.5%. Most of the respondents are women (68.25%). 69% of respondents are employed, 8.5% are in search of a job, 4.25% of respondents are unemployed. 18.25% of survey participants study at educational institutions of the Republic; some of them also combine work and study.

For half of the participants in the sociological survey (51.5%), corruption is a significant problem, 27.75% attribute it to extremely acute problems, for 15.75% of respondents this problem is insignificant, and for 5% this is not a problem at all. Among respondents, 102 people (25.5%) are residents of Kazan, 160 people (40%) live in Naberezhnye Chelny, 80 respondents (20%) are residents of Nizhnekamsk and 58 (14.5%) live in Almetyevsk.

According to the results of a concrete sociological study, the population classifies as corruption various acts. Most of the participants consider the following actions: receiving a bribe (92%), giving a bribe (86%); a crime committed by an official for personal gain in personal interests, in the interests of other persons/organizations (75%), and any crime committed by an official using his/her official position (74.25%).

The lowest grades of corruption have been received for the following: giving gifts to officials; any crime committed by an official and provision of any lawful services by an official – 9.5%, 6%, and 5%, respectively.
The main goals of giving a bribe to an official are presented in Table 1.

Table 1. Opinion of the respondents on the purpose of giving a bribe (%)

The purpose of giving a bribe	%
1) violate the established procedure for resolving issues in their own interests (the desire to circumvent the law)	24,25
2) solve the problem with government representatives in their favor	52
3) escape responsibility for committing wrongdoing	37,75
4) get any help, including illegal (get benefits)	25,25
5) conniving at work (close eyes to improper fulfillment of official duties)	14,5
6) promotion (assistance in rapid advancement on the career ladder)	15,25
7) patronage of service (unreasonable appointment to a higher position)	12,5
8) meet personal needs that are expressed in obtaining certain benefits or benefits	36,75
9) meet the interests of third parties	11,5
10) for the purpose of gratitude to the official unforeseen by law, advance due remuneration for already committed lawful action in service	15,25
11) for the purpose of remunerating the official after the commission of a specific action (inaction) in favor of the bribe giver	11
12) for the purpose of bribing (for committing (evading from committing) a particular action in the interests of the briber)	35
13) Hard to answer	5,25

Source: own research

According to the respondents, the main objectives for which people resort to giving a bribe to an official are the following:

- solving the problem with representatives of public authorities in their favor – 52%;
- avoiding responsibility for committing unlawful actions – 37.75%;

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- meeting personal needs, which are expressed in obtaining certain preferences or benefits – 36.75%;
- committing/evading from committing a particular action in the interests of the briber – 35%.
-

Rarely, people resort to giving a bribe to an official with the goal of satisfying the interests of third parties (11.5%) and remunerating an official after he/she has committed a certain action (inaction) in favor of the briber – 11%.

It should be noted that out of 208 people who indicated a solution to the problem with representatives of state authorities in their favor, 94 respondents are from Kazan (92.12% of the Kazan sample) and 104 people from Naberezhnye Chelny (65% of the Naberezhnye Chelny sample).

The main causes of corruption crimes, according to residents of the Republic of Tatarstan, are: insufficient control over the activities of officials, poorly identifying corruption crimes (52%), insufficient effectiveness of punishment for corruption crimes (50.75%), imperfect laws, leading to the appearance of officials, using loopholes for personal gain (31%).

36.25% of respondents believe that the opinion in the team does not matter for the commission of a corruption offense by an official.

To a large extent, officials agree to bribe because of self-interest (51.5%), confidence that they will go unpunished (48.25%), insecurity in material well-being in the future (35%), as well as the corruption of the very system of authorities (30%). The reasons for extortion of a bribe by officials are also largely due to self-interest (62%), confidence in impunity (52.5%), and difficult financial situation (35.5%).

With regard to anti-corruption measures in the Republic of Tatarstan, it is possible to state a positive attitude of the population: more than half of respondents believe that giving a bribe (54.5%) can be avoided to solve their own problems, 28.5% of respondents indicate the need to avoid it. Only 15% of survey participants consider bribes a necessary part of life.
Meantime, respondents are more convinced (56%) that without a bribe, problems are not solved or are solved with great difficulties.

5. Data Analysis

The main elements of the analysis were chosen as follows: the attitude of the population toward corruption, opinions on the level of corruption of various authorities and areas of activity, the presence of corruption situations in the life of respondents, the attitudes toward publications in the media about corruption, the opinion of respondents about the effectiveness of measures to combat corruption.
First, it is necessary to analyze the results obtained regarding the attitude of the respondents toward corruption (see Fig. 1).

Only 44% of respondents show a sharply negative and a negative attitude toward corruption (see Fig. 1). 43% indicated a tolerant or neutral attitude toward manifestations of corruption, and 7% referred to it positively.

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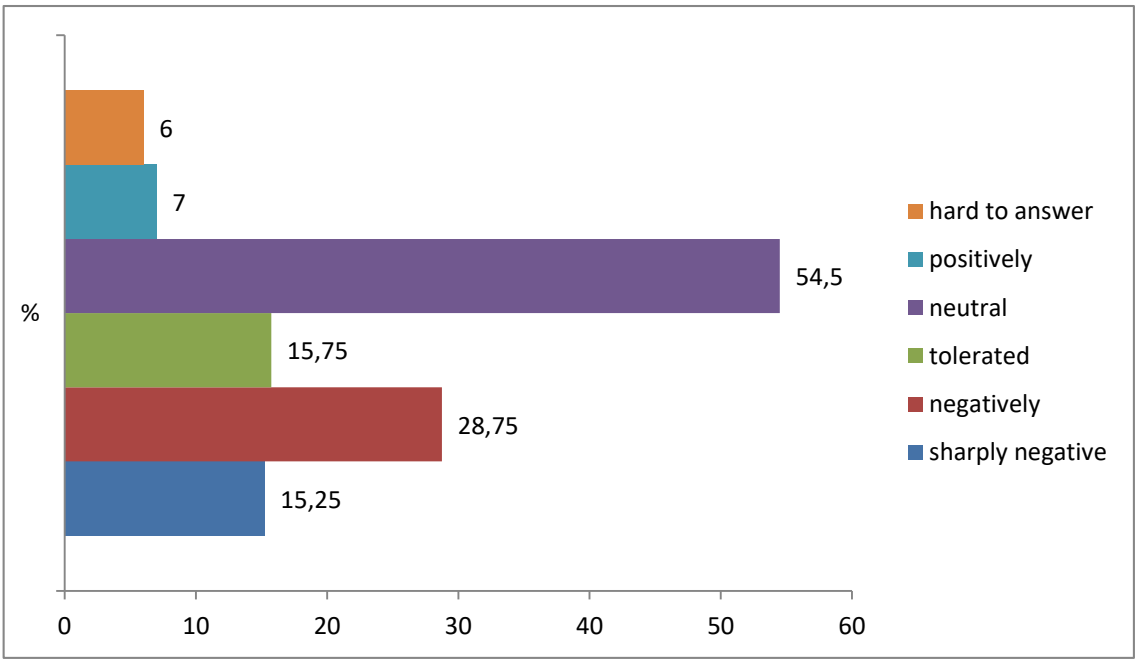

Fig. 1. Attitudes of respondents toward corruption (%)
Source: own research

When assessing the level of corruption of various authorities and spheres of activity, it was found that the majority of respondents noted the highest degree of corruption in the traffic police (76%), the housing (76.25%), the prosecutors (75.75%), the public administration (75.25%), and the police (74%) (see Fig. 2).

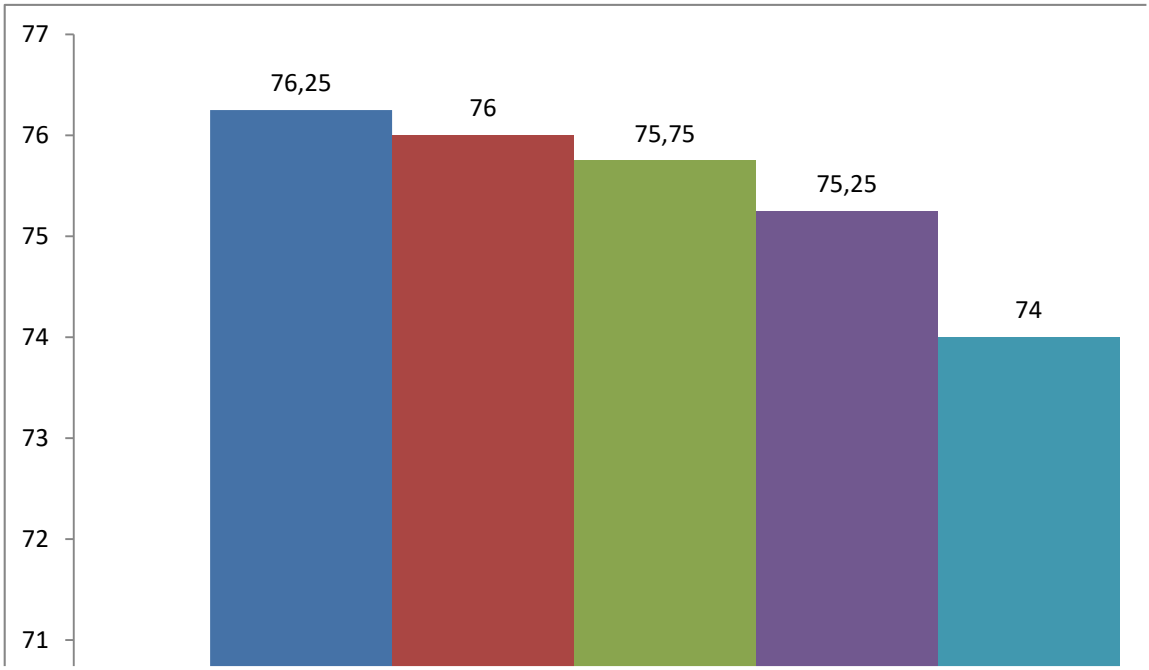

Fig. 2. The most corrupt areas of activity, according to respondents (%)
Source: own research

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In addition to individual responses, the respondents identified a high level of corruption in the military sphere (4%) and the Russian Orthodox Church (2.75%). The respondents allowed a low level of corruption in the drug control bodies (40.75%), the consumer rights protection authorities (40.5%) and the Federal Security Services (FSB) (29.75%). Some respondents still admit the absence of corruption in the FSB (7.25%), the investigative bodies (5.25%), in the sphere of culture and sports (4%), the municipal services (3.5%), the prosecutors (3%), the police (1%), as well as in the economic sphere (0.5%) and the traffic police (0.25%). It should be noted that all survey participants believe that to one degree or another, corruption is present in the legislative and judicial bodies and the political sphere. Thus, more than half of the respondents (56.5%) point out a high level of corruption in the political sphere.

In terms of increasing the social tension of the population, there are also concerns about the results of the fact that 51.75% of respondents assess with a high level of corruption the investigative bodies, 48% – the legislative and registering bodies, 47.5% – judicial bodies, a quarter of respondents (26.5%) indicate a high degree of corruption in the FSB. A high level of corruption in the business sphere (50.75%), in the tax authorities (46.75%), in the education (40.75%) and the economic sphere (34.5%) potentially cause the low growth of the Republic's economy due to the development of the business environment and entrepreneurial competencies. This state of affairs hampers the economic development of the territory, thereby reducing its competitiveness. Mostly, when a crime of corruption is committed, respondents condemn the one who extorts a bribe (52.25%), and 40% equally condemn all (the extortionist, briber and intermediary).

Over the past 2 years, 339 people out of the number of respondents (84.75%) got into corruption situations, which were more related to the traffic police (57.42%), healthcare (29.58%), and education (13.34%). Of the 12 people who refused to give a bribe, the main reason (66.64%) was the "not affordable" amount of the bribe, only one person said about his principled attitude not to give a bribe. The population believes that publications in the media about facts of corruption mostly pursue political goals – to remove a competitor, an "inconvenient" person, etc. (93.75%) and clearly aim to create for people a picture of a successful fight against corruption, regardless of its results (87.25%). Only 6.5% of respondents rated the objectivity of the information in the media about the fight against corruption at maximum points, and 32.25% of the participants in the survey put the minimum points for this indicator. This more testifies to the populism of coverage of anti-corruption issues in the media than to the real picture of the current state of affairs.

From the point of view of survey participants, the most effective measures to combat corruption (maximum effectiveness of 4-5 points) are the following (see Table 2):

– use technical means to openly see the activities of officials – 96.25%;

– verification of the accuracy and completeness of information on income, property and property obligations represented by officials, their spouses and minor children – 91%;

– public control over the activities of officials – 90%;

– strengthening state control over the activities of officials – 88.5%;

– criminal prosecution and punishment without any exceptions – 88.5%;

– toughening criminal penalties for corruption – 83.75%;

– free access to public services – 80.75%;

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– formation of intolerance in society towards corrupt behavior – 63.25%;

– improvement of legislation, effective implementation of existing regulations – 60%;

– reduction in the number of state and municipal employees – 53.25%.

Table 2. The effectiveness of measures to combat corruption, according to respondents (%)

Anti-Corruption Measures	1 point	2 points	3 points	4 points	5 points
Improving legislation, effective implementation of existing laws	10,75	14,25	15	18	42
Encourage a long, flawless and efficient performance of official duties	**41,25**	**22,75**	35	1	-
Strengthening state control over the activities of officials	0,25	2	9,25	16	**72,5**
Providing public control over the activities of officials	3,75	3,25	3	14,5	**75,5**
Increased penalties for corruption	4,25	4,75	7,25	26	**57,75**
Wider coverage of anti-corruption activities in the media	-	5	**53,75**	32,75	8,5
Formation of social intolerance towards corrupt behavior	1	10,25	25,5	28,75	34,5
Free access to public services	3,5	6,25	9,5	30,25	**50,5**
Providing citizens with access to information about the activities of federal government bodies, including the subjects of the Russian Federation and local governments	5	35,75	31	26,25	2
Open decision-making by government representatives	15,25	18,25	24,5	36	6
Reducing the number of state and municipal employees	23	18	5,75	23	30,25
Increase in material and social security of officials	**31**	**40,5**	22,5	2	4
In the case of a crime to prosecute and punish without exception	3,5	5,25	2,75	12,25	**76,25**
Conduct demonstration, exit trials of bribe takers	8,75	9,75	46	17	18,5
Use technical means of openly monitoring the activities of officials	0,5	2,5	0,75	45,5	50,75
Development of institutions of public and parliamentary control over compliance with legislation on countering corruption	8	26	**60,25**	4	1,75
Presentation of qualification requirements for citizens applying for filling positions of state or municipal service	15,25	28,5	**51,25**	2,25	2,75
Verification of the accuracy and completeness of information about income, property and property obligations represented by officials, their spouses and minor children	1,75	1	6,25	13,25	**77,75**

Source: own research

The measures of a moderate degree of effectiveness (3 points) in the fight against corruption are the following:
– development of institutions of public and parliamentary control over the observance of anti-corruption regulations – 60.25%;

– wider coverage of anti-corruption activities in the media – 53.75%;

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– introduction of qualification requirements for citizens applying for positions of state or municipal service – 51.25%.

71.75% of respondents mentioned raising the material and social security of officials, as well as motivation for the continuous, flawless and efficient performance of duties by an official (64%) as an ineffective measure to combat corruption.
The majority of respondents are positive about toughening criminal penalties for giving a bribe: 43.5% do not allow any doubt, and 52.25% are more positive than negative.
Of the economic penalties for corruption crimes, 94.75% of respondents consider confiscation, but not a fine, effective (see Table 3).

Table 3. The choice by respondents of effective penalties for corruption crimes (%)

Effectiveness of penalties	1 point	2 points	3 points	4 points	5 points
Economic					
Confiscation	-	1,75	3,5	**15,5**	**79,25**
Penalty	**25,75**	**54,75**	19	0,5	-
Imperative					
Long imprisonment	-	-	-	**9,5**	**90,5**
The death penalty	7	3,5	6,25	**8,5**	**74,75**

Source: own research

Among the mandatory measures of punishment, 100% of those surveyed mentioned long-term imprisonment and 83.25% – death penalty as the measures having maximum effectiveness. The results show that the population does not trust the solution of their questions by the authorities and the protest mood of the population, the lack of tolerance for power and the social tension of the society.
At the same time, answering the question about the acceptability of death penalty for committing a corruption offense, only 42.25% of the respondents were categorically against the death penalty, because it can become a way of getting rid of "undesirable" people, and corruption will still flourish.

6. Discussion

When analyzing the data obtained, a contradiction arises: the respondents consider the death penalty to be an effective punishment, but they show humanism in this connection.

One can see a negative attitude of the population regarding the prospects of fighting corruption in the next 3-5 years – 70.25% of respondents believe that the situation is unlikely to change. This may also be due to this reason: 65% or 313 survey participants are not ready to report corruption facts that have become known to them. Consequently, the population, to a greater extent, places the responsibility for fighting corruption on the authorities, demonstrating at the same time a low level of readiness to express their citizen stand and report on the fact of corruption.

Of the 87 people who are ready to report a crime of corruption, 37 people (42.55%) will report to the prosecutor; 33.35% (29 people) to the anti-corruption commission and 24.15% (21 people) to the helpline.
According to the results of the survey, applying to the police, or via e-mail to the law enforcement agencies and to own leadership does not arouse confidence in the population.

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Table 4. Reasons for keeping silent about the facts of corruption (%)

Why do you think people with certain information do not report corruption?	%
1) consider it useless, still measures will not be taken	43,5
3) it is dangerous not only for them, but also for their loved ones due to possible negative consequences	42,75
2) they do not wish to bother themselves (to appear upon the call of the investigator, etc.)	13,75
4) do not consider it necessary, believing that this will inevitably become known to law enforcement agencies	0
5) difficult to answer	0

Source: own research

Survey participants name two main reasons why they do not report corruption: the futility is 43.5% and the presence of danger and negative consequences for families – 42.75%.
Over the past 2 years, 18 people out of those polled have turned to law enforcement agencies about a corruption offense.

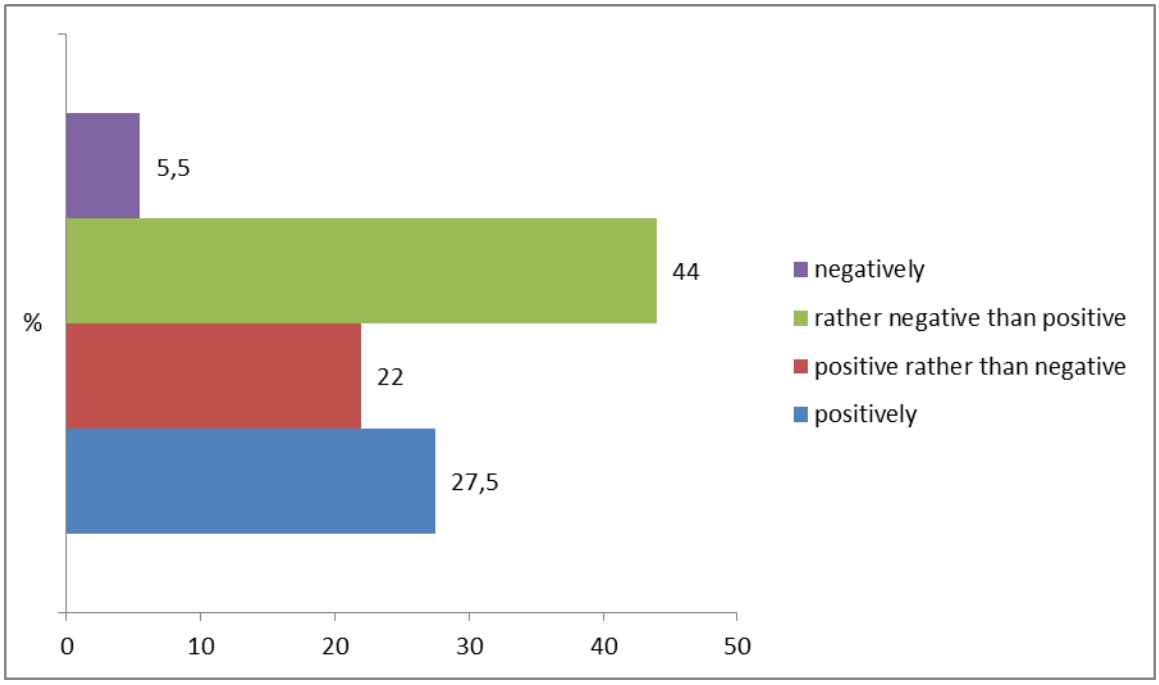

Fig. 3. Opinion of respondents about the attention shown to them by the law enforcement agencies when addressing the fact of corruption offense (%)

Source: own research

44% of them (8 people) rated the attention to them rather negatively than positively. 27.5% of respondents (5 persons) were completely satisfied with the attention to solving the problem.

The data on the possibility of exemption from criminal responsibility of participants in a corruption offense were also of interest. Thus, 87.75% of respondents believe that it is possible to exempt a bribe-giver from criminal liability in the following cases: existing extortion against him/her by an official; repentance and voluntary reporting of the incident to the internal affairs bodies (57.75%) and rendering maximum assistance in solving the crime (54.25%). The population is also quite loyal to the intermediary in a corruption offense and allows

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exemption from criminal liability in cases of active assistance in solving and/or stopping a crime (69.75%) and voluntarily reporting to the authorized body on mediation in bribery (63.5%).
A categorical "no" about the possibility of exemption from criminal responsibility was chosen by the respondents for the bribe-taker in cases if an official receives an offer from a briber (76%) and repentance and voluntary reporting about the incident to the internal affairs bodies (67%).

Thus, there is a duality and ambiguity of the respondents in relation to the various participants in a corruption offense. This may also be due to the insufficient level of anti-corruption training.

Conclusions

According to the results of the study, it is possible to formulate the following conclusions:
– there is an integrative effect of various socio-economic problems on the sustainable development of territories;
– corruption is one of the main social factors impeding the sustainable development of a region.
According to the results of a sociological study of the population in the Republic of Tatarstan, the hypotheses were confirmed that various manifestations of corruption have a serious impact on the sustainable development of the region, its economic growth, and hidden social tensions in society. The negative perception of anti-corruption measures was also confirmed, which confirms the low level of trust and the lack of tolerance of the population towards the authorities in solving problems of corruption.

The hypothesis of increasing the level of anti-corruption training and anti-corruption behavior of the population of the Republic of Tatarstan was partially confirmed: on the one hand, a positive change in the public's attitude to avoid giving a bribe; on the other hand, the negative attitude of the respondents based on the coverage of anti-corruption issues in the media, which may be due to populism, rather than presenting a real picture of the current state of affairs. Further research is needed to identify the relationship between the level of corruption and indicators of the region's development effectiveness.

In order to improve the organization of anti-corruption work is proposed:
1. To continue the work on the formation of anti-corruption behavior among the population.
2. Develop mechanisms that provide opportunities to fearlessly report on the facts of corruption crimes and the protection of persons providing such information.
3. Organize work in the media to form a positive image of law enforcement agencies in the fight against corruption on a regular basis.
4. To ensure transparency of reporting on the fight against corruption in the law enforcement agencies themselves and the measures taken, to place information in the public domain.
5. Organize a transparent system of public feedback with the authorities throughout the vertical on issues of corruption.
6. Ensure a wide and open discussion on the websites of law enforcement agencies and official web pages on the problems of corruption, survey results, provide the opportunity to leave open reviews without the possibility of their removal with the creation of the tab "Fact of corruption".
7. To ensure discussion in the mass media of the role of civil society in the participation of public control in the field of combating corruption.
8. Develop and implement mechanisms for the use of various public control tools.
9. To ensure the conduct of public control on the basis of continuous analysis of indicators of public anti-corruption monitoring.

10. Develop monitoring indicators for assessing the effectiveness of the region's sustainable development, incorporating the level of corruption as an indicator of sustainability.
11. Expand the pilot study toolbox to organize and conduct further integrated research together with economists to identify the correlation of the measured level of corruption with the economic indicators of the region's development.

References

Asaliev, A. M., Poltarykhin, A. L., & Alkhimenko, O. N. (2014). Intellectual capital: Theory and approaches of its assessment on macro level. World Applied Sciences Journal, 30(10), 1404-1408. https://doi.org/10.5829/idosi.wasj.2014.30.10.14187

Badrutdinov, MS, Rakhimov, S.F. (2013) Interaction in the Republic of Tatarstan of state authorities and local authorities with civil society institutions on the implementation of anti-corruption policy and financial control. Actual problems of economics and law, (27), 227-234.

Baklanov, P.Ya. (2014) Territory of advanced development: concept, structure, approaches to the selection. Regional studies, 3: 12-19.

Barsukova, S. (2019). Informal practices of big business in the post-soviet period: From oligarchs to "kings of state orders". Demokratizatsiya, 27(1), 31-49.

Batzilis, D. (2019). Electoral competition and corruption: Evidence from municipality audits in Greece. International Review of Law and Economics, 59, 13-20. https://doi.org/10.1016/j.irle.2019.04.003

Campbell, L. (2018). The organisation of corruption in commercial enterprise: Concealing (and revealing) the beneficial ownership of assets. Corruption in commercial enterprise: Law, theory and practice (pp. 82-101) https://doi.org/10.4324/9781315105796

Chaldayeva, L.A., Kilyachkov, A.A., Sivakov, O.G. (2014). The role of the business community in the fight against corruption. Finance and credit, (617), 2-8.

Denkers, A. (2018). Mickey-mouse-money and gingerbread cookies: Bonuses and organizational measures as predictors of corruption in organizations. Corruption in commercial enterprise: Law, theory and practice (pp. 124-142) https://doi.org/10.4324/9781315105796

Dyatlov, G.A., Isakova, Yu.I. (2018) Spheres and forms of the spread of corruption. Science and education: economy and economics; entrepreneurship; right and management, 3(94), 92-96.

Eli, C.K. (2016) Analysis of the main trends of corruption crime in Russia. All-Russian Journal of Criminology, 10(3), 531-543.

Fedorinin, V. N., & Zhuravlev, P. V. (2002). New developments of optopolarization sensor devices and articles based on them. Paper presented at the Proceedings of SPIE - the International Society for Optical Engineering, 4900(2) 982-987. https://doi.org/10.1117/12.484491

Feschenko, P.N. (2014). Functioning of the anti-corruption monitoring system: quality improvement issues. Actual problems of economics and law, 1(29), 66-71.

Frolova, OV, Bibarsova, G.Sh. (2017). Corruption in modern Russia as a threat to state and public security. Humanitarian problems of military affairs, (11), 75-77.

Garipov, I.M., Kabanov, P.A., Magizov, R.R. (2014). Victimological measurement of the state of commercial corruption in the Republic of Tatarstan (analysis of statistical indicators for 2007-2011). Criminology: yesterday, today, tomorrow, 2(33), 51-56.

Goloshchapova, L. V., Plaskova, N. S., Prodanova, N. A., Yusupova, S. Y., & Pozdeeva, S. N. (2018). Analytical review of risks of loss of profits in cargo transportation. International Journal of Mechanical Engineering and Technology, 9(11), 1897-1902.

Golubovsky, V.Yu., Sinyukova, T.N. (2015). Forms and types of corruption in the modern Russian society. Political linguistics, 2 (52), 240-246.

Gulkov Yu.V., Turysheva A.V., Kopteva A.V. (2019). Research of Grounding Systems of Electrical Complexes in the Conditions of Permafrost Soils. Proceedings of the 2019 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus pp. 969-972. https://doi.org/10.1109/EIConRus.2019.8657119

Ige, O. (2019). Using action learning, concept-mapping, and value clarification to improve students' attainment in ICT concepts in social studies: The case of rural learning ecologies. Journal of Social Studies Education Research, 10(1), 301-322.

Ilyina, I., Kulibanova, V., & Teor, T. (2019). Special aspects of master data-based integrated management of region reputation in modern IT environment. Paper presented at the IOP Conference Series: Materials Science and Engineering, 497(1) https://doi.org/10.1088/1757-899X/497/1/012022

Ivanova, V. N., Atyukova, O. K., & Poltarykhin, A. L. (2018). Prerequisites of growth of investment and social attractiveness of the regions of russia within the framework of implementation of the public-private partnership projects. International Journal of Mechanical Engineering and Technology, 9(11), 2299-2305.

Kabanov, P.A. (2012) Criminological monitoring of the interaction of public authorities of the constituent entities of the Russian Federation with civil society institutions in the field of combating corruption. Monitoring law enforcement, 4, 25-31.

Kochurova, I.G. (2017). Anti-corruption in the Republic of Tatarstan. In the collection: "The State and the legal system of the Russian Federation in the conditions of the information society": a collection of articles of the International Scientific and Practical Conference. p. 34-38.

Korableva, O., Durand, T., Kalimullina, O., & Stepanova, I. (2019). Usability testing of MOOC: Identifying user interface problems. Paper presented at the ICEIS 2019 - Proceedings of the 21st International Conference on Enterprise Information Systems, 2 468-475.

Kordík, M.; Kurilovská, L. (2018). Intra group compliance agreement as a tool to manage the risks in the daughter companies. Entrepreneurship and Sustainability Issues, 5(4), 1008-1019. http://doi.org/10.9770/jesi.2018.5.4(21)

Lipatov, V.A., Naimzada, M.D.Z., Denisov, A.A., Terekhov, A.G. (2017) The results of a sociological opinion poll on the level of corruption in the Kursk region. In the collection: “Scientific basis for the development and application of anti-corruption measures”: a collection of scientific papers based on the materials of the regional forum “Youth. The science. Innovations” in the Regional Scientific and Practical Conference “Anti-Corruption in Modern Society ”. p. 24-34.

Luzgina, A. (2017). Problems of corruption and tax evasion in construction sector in Belarus. Entrepreneurship and Sustainability Issues, 5(2): 263-282. http://doi.org/10.9770/jesi.2017.5.2(8)

Malyutina, A.A. (2015) Formation of a mechanism for managing the sustainable development of municipal socio-economic systems in the region. Bulletin of the Samara Municipal Institute of Management, 3, 52-60.

Mullins, R. (2019). Using Dewey’s Conception of Democracy to Problematize the Notion of Disability in Public Education. Journal of Culture and Values in Education, 2(1), 1-17. Retrieved from http://cultureandvalues.org/index.php/JCV/article/view/24

Nagimov, A.M., Nagimov, M.A. (2015) State of corruption in government bodies in the Republic of Tatarstan: analysis of public opinion. In the collection: “Corruption: the state of counteraction and the direction of optimization of the struggle”: Russian Criminological Association. p. 228-235.

Naushad, M., Faridi, M.R., Malik, S., A. (2018). Economic development of community by entrepreneurship: an investigation of the entrepreneurial intent and the institutional support to the local community in Al-Kharj region. Entrepreneurship and Sustainability Issues, 5(4), 899-913. http://doi.org/10.9770/jesi.2018.5.4(14)

Osipov, G.V., Glotov, V.I., Karepova, S.G. 2018. Population in the shadow market: petty corruption and unpaid taxes. Entrepreneurship and Sustainability Issues, 6(2), 692-710. http://doi.org/10.9770/jesi.2018.6.2(16)

Pankratov, A.Yu. (2011) Monitoring of corruption and implementation of anti-corruption policies in the Republic of Tatarstan: theory and practice. Actual problems of economics and law, 3(19), 255-259.

Papakostas, A. (2016) Formation of a civilized public sphere distrust, trust and corruption. Monitoring public opinion: economic and social changes, 1(131), 346-362.

Pavlyuk, A. V., Kokorev, A. S., Lazareva, T. G., & Artemova, E. I. (2018). Assessment of the economic security of the region (on the example of Chelyabinsk region). Journal of Applied Economic Sciences, 13(8), 2309-2322.

Petukhov, A. A., Dar'in, A. A., & Telyakov, N. M. (2017). Processing of ferromanganese nodules of the Pacific Ocean. Metallurgist, 61(5-6), 439-443. https://doi.org/10.1007/s11015-017-0514-9

Ponomareva, N., Zvereva, A., Golubtsova, E., Novikova, E., & Maximov, D. (2019). Approaches to the improvement of tax auditing for operations with intellectual property in the Russian Federation. Espacios, 40(10)

Poltaradneva, E.V., Goverdovskaya, I.N. (2014) Corruption in society: a sociological approach to the problem. In the collection: "Development of the institute of managerial personnel reserve in the constituent entities of the Russian Federation as a challenge of time and an effective tool for improving state personnel policy": collection of articles of the Interregional Scientific and Practical Conference (October 9, 2014, Samara). Samara, p. 284-289.

Prodanova, N. A., Plaskova, N. S., Bochkareva, N. G., Babalykova, I. A., Gazizyanova, Y. Y., & Zherelina, O. N. (2019a). Integrated Corporate Reporting as An Innovative Business Reporting Model. International Journal of Engineering and Advanced Technology, 8(5), 2075-2078.

Prodanova, N. A., Trofimova, L. B., Adamenko, A. A., Erzinkyan, E. A., Savina, N. V., & Korshunova, L. N. (2019b). Methodology for assessing control in the formation of financial statements of a consolidated business. International Journal of Recent Technology and Engineering, 8(1), 2696-2702.

Pujiyono, Setiawan, F. A., & Hutabarat, D. M. T. (2019). A new approach to preventing corruption in indonesia: A study of the TP4 in central java, indonesia. Journal of Social Studies Education Research, 10(1), 93-115.

Saltykova, O.P. (2018) Prevention of corruption in the context of public policy. Bulletin of the Volga Institute of Management. 18(1), 64-71.

Savchenko, I.A., Snegireva, L.A., Ustinkin, S.V. (2018) Causes of corruption in the cross-methodological dimension. Power, 26(5), 35-39.

Sasongko, G., Huruta, A.D., Wardani, A. (2019). Does the Wagner's Law exist in a strategic national area? An evidence from Kedungsepur – Indonesia. Insights into Regional Development, 1(2), 99-117. https://doi.org/10.9770/ird.2019.1.2(2)

Sharafutdinov, R. I., Polyakova, A. G., Gerasimov, V. O., Shpakova, R. N., & Mikhailova, M. V. (2019). Inclusive growth: A dataset on key and institutional foundations for inclusive development of Russian regions. Data in Brief, 23. https://doi.org/10.1016/j.dib.2019.103864

Shumakova, O., Poltarykhin, A. L., & Mozzherina, T. G. (2016). Import substitution as the basis of solving problem related to food safety of the russian federation. International Journal of Applied Business and Economic Research, 14(9), 5911-5920.

Temnikov, E.G. (2017) Anti-corruption education in the Republic of Tatarstan. In the collection: "Bulletin of scientific works" Yurist": based on the materials of the meeting of the I Council of youth public organizations and associations of the Republic of Tatarstan in the field of combating corruption. Ed. I.Sh. Mukhametzyanova, S.L. Alekseeva, R.N. Shaydullina. p. 19-23.

Tvaronavičienė, M. (2018). Towards sustainable and secure development: energy efficiency peculiarities in transport sector. Journal of Security and Sustainability Issues, 7(4), 719-725. https://doi.org/10.9770/jssi.2018.7.4(9)

Vlasenko, M.A. (2015) Features of the anti-corruption policy of modern Russia. Caspian region: politics, economy, culture, 3(44), 167-173.

Volkonskaya, E.K. (2018) Criminological assessment of the current situation related to corruption crimes in Russia. LexRussica, 4(137), 121-135.

Voronkova, O. Y., Iakimova, L. A., Frolova, I. I., Shafranskaya, C. I., Kamolov, S. G., & Prodanova, N. A. (2019). Sustainable development of territories based on the integrated use of industry, resource and environmental potential. International Journal of Economics and Business Administration, 7(2), 151-163.

Yeparkhina, O.V. (2013). Modeling Corruption. Yaroslavl Pedagogical Gazette, 1(1), 110-116.

Zeibote, Z., Volkova, T., Todorov, K. (2019). The impact of globalization on regional development and competitiveness: cases of selected regions, Insights into Regional Development 1(1): 33-47. https://doi.org/10.9770/ird.2019.1.1(3)

Zhang, H., Song, Y., Tan, S., Xia, S., Zhang, H., Jiang, C., . . . Lv, Y. (2019). Anti-corruption efforts, public perception of corruption, and government credibility in the field of real estate: An empirical analysis based on twelve provinces in China. Cities, 90, 64-73. https://doi.org/10.1016/j.cities.2019.01.042

Zhuravlev, P. V., Poltarykhin, A. L., Alkhimenko, O. N., & Kuksova, O. D. (2018). Human capital and its efficiency in the knowledge economy: The role of continuing education. Espacios, 39(46)

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A MODEL FOR SELECTION OF A MANAGEMENT TEAM TO ENSURE THE SUSTAINABILITY AND DEVELOPMENT OF THE BUSINESS ORGANIZATIONS

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Abstract. The managers, through their professional qualifications, personal qualities, norms of behavior and acquired experience, ensure the achievement of the targets and strategies set in the economic organizations. In this respect, the guarantee of their sustainability and development is only possible through building an effective system of selection of the management staff. In the context of the systematic approach, it is of paramount importance to develop a model for selecting a management team to ensure the sustainability and development of the businesses. The justification of the factors, as well as their action and interaction to achieve the sustainability and development of the economic organizations, is of high value for the implementation of a system for selection, training and professional development of the management team. In this regard, the research on organizations which have achieved positive financial and economic results can help to clarify the strength of the interrelation between the varying factors in the selection of a management team. The purpose of the actual article is to explore and model the main factors for selecting a management team, which have a direct or indirect impact on the sustainability and development of the business organizations in Bulgaria.

Keywords: Management team, sustainability, development, economic organization, Bulgaria

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1. Introduction

The creation of a skilled management team is essential to achieving the goals of the business organizations. It is the basic platform in building the general administration of the companies.

The scientific achievements, which explore the place and role of the management factor in the economic organizations, show significant results in the comprehension and structuring of this subject (Petrova et al, 2018); (Dyachenko et al., 2018); (Koval et al., 2018); (Zahars & Stivrenieks, 2018); (Tumalavičius et al., 2017); (Bogomolov et al., 2018). The recognition of the management team as a valuable asset and, accordingly, the holder of a competitive advantage for each business organization, is the mainstay of these scientific achievements. The managers, through their professional qualifications, personal qualities, norms of behavior and experience, ensure the achievement of the goals and strategies.

An important feature is also stimulation of the organization's innovativeness (Pukala, 2016). Domestic and foreign researchers (Labunska et al., 2017); (Dyachenko et al., 2018); (Odinokova et al., 2018); (Sushchenko & Trunina, 2016); (Mentel et al., 2016); (Uteubayev, 2015) noted that in the innovation economy, the efficiency evaluation based on multiple criteria is a more complicated option, but on the other hand, this evaluation gives more insight into the real state. In this sense, the guarantee of the sustainability and development of the business organizations is only possible by building an effective system of selection of the management personnel. In the context of the systematic approach, it is of paramount importance to develop a model for selecting a management team to ensure the sustainability and development of the business organizations.

Also modern managers should take into account trends in objective processes of the XXI century, for example, digitalization, open innovation etc. According these trends “companies should not only be for the sake of personal gain, but also the common good of development, respect the inventions of their competitors and raise the level of innovation culture of their employees” (Strizhkova, 2019). In such conditions huge role have managers with their skills and other factors that give the ability to see the trends of modern times and adjust their companies to new changing conditions like the world top-companies (IBM, Tesla Motors, Apple and other).

Currently, the selection and development of the management staff can be seen as a complex system of interrelationships and dependencies among various factors. They have a direct or indirect impact on the sustainability and development of the companies. The development of models of the factors for selection of the management team allows for the realization and application in practice of multiple approaches and mechanisms. The justification of the factors, as well as their action and interaction for the achievement of sustainability and development of the business organizations, is of highest importance for the development of a system for selection, training and professional development of the management team. In this regard, the study of organizations, which have achieved good financial and economic results, can help to clarify the strength of the interrelation between the different factors in the selection of a management team.

The purpose of the actual article is to explore and model the main factors for selecting a management team which have a direct or indirect impact on the sustainability and development of the business organizations in Bulgaria.

To achieve this goal, the following tasks are developed and solved:
• Presentation of the basic requirements for selecting a management team in the context of their nature, economic content, composition, structure and significance in the conditions of an increasing competition and dynamically developing socio-economic environment;
• Revealing of the specifics for selecting a management team and developing a system of factors for their assessment in different in size, status and legal structure businesses;

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• Analysis and evaluation of the current socio-economic conditions for revealing the tendencies for selection and development of the managerial staff, by developing a statistical and mathematical model of the main factors which are particularly important for achieving the sustainability and development of the economic organizations.

The article is structured into two main sections. The first includes an analysis of the factors for selection of a management team, by exploring their interrelations and attitudes towards sustainability and development. The second section presents a model of the factors which are particularly important for the achievement of the sustainability and development of the companies.

2. Material and method

The effectiveness of its management plays an important role for the proper functioning of each economic organization, which directly affects its final economic results. Those provide information on the overall outcome of the skillful management work and the effective use of the human resources. In this regard, the realization of profit is considered to be and in fact is a basic value indicator, expressing the degree of efficiency of the management in the economic organizations.

The research on and analysis of the management teams in the companies which made profit, can reveal the real opportunities for sustainability and development of the businesses. In this sense, the profit is considered as a function of properly taken managerial decisions regarding the administration of the production process and the realization of the production. This is the reason why, in the present study, the profit is considered as the main indicator which takes into account the efficiency of management, ensuring the sustainability and development of the economic organizations. Another important element that should be taken into account, is to ensure its long-term stable development and building innovation (Pukala et al., 2018; Kuzmin et al. 2019).

To investigate the factors for the selection of management teams, 97 different in size and sector of activity companies in Bulgaria were researched. (Fig.1). Selection of these organizations is based on their high economic performance, i.e. realized profit for the period under review. The characteristic features and the conditions under which the production activities of these economic organizations are carried out provide an objective picture of the state and opportunities for the development of the managers in the different economic sectors of the country. The recording of their characteristics is a key point in developing a model for selecting a management team to ensure sustainability and development of the business organizations.

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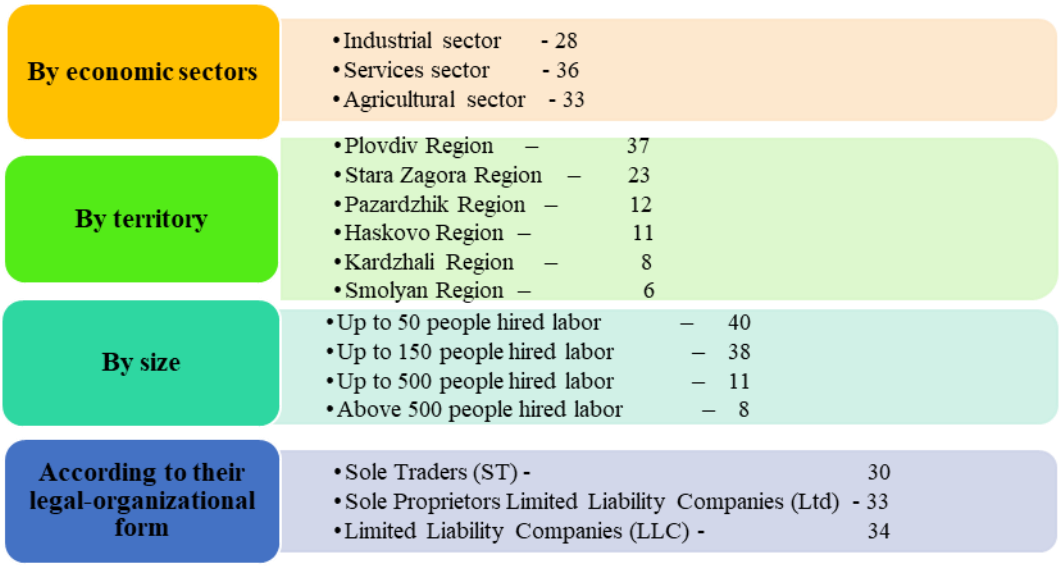

Fig.1. Classification of the target companies according to various criteria

Source: developed by the authors

The action and interaction of the key management selection factors influencing the sustainability and development of the business organizations is explored using Pearson's correlation analysis. It allows for calculation and analyses of the correlation coefficients of the following factors:

- Number, structure and professional experience of the employees - revealing the age and gender structure, as well as the work experience of the managerial staff;
- Educational and professional-qualification profile - examines the level of education and qualification of the managers in the economic organizations;
- Employee efficiency - revealing the labor productivity and its impact on the positive economic performance;
- Remuneration and material incentives of labor - representing the level of basic and additional remuneration, in compliance with the Labor Code and the internal regulations in the represented business organizations.

The factors studied are tailored to the specific features of the management staff (Tables 1). Under management staff, we consider all managers from different levels of administration who have the power to take and implement management decisions without them necessarily being coordinated with managers from other levels.

To achieve a greater depth of the research, the business organizations are also considered by types of their legal form in Bulgaria. The first group includes business organizations - Sole Traders (ST). These are predominantly small-sized organizations where the bulk of the production is aimed at the local markets. In the second and third groups are the capital companies. These include Sole Proprietors Limited Liability Companies (Ltd.) and Limited Liability Companies (LLC). In these businesses, the key factors for achieving positive economic performance are the vocational education, the qualifications and the experience in the specific sphere.

In order to build the model of the main factors influencing the efficiency in the selection of the management team, the technique of the Path-coefficient analysis is applied. This method combines the possibilities of the correlation, regression and structural analysis, which makes it one of the most appropriate methods of studying

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interconnections. The Path analysis examines not only the direct but also the indirect links between the factors for selection of the management staff and the achievement of sustainability and development of the economic organizations. In this way, the factors having the most impact are evaluated, and the ones with insignificant influence are eliminated.

Table 1. Factors for selection of managerial teams

Factors for Selection of Managerial Teams			
Number, structure and professional experience of the employed	Educational and professional-qualification profile	Employee efficiency	Remuneration and material incentives
1.*Number of total employees in the company;* a/ / incl. management staff; 2. *Age structure of the management personnel* a/ from 15 to 35 years; b/ 36 to 55 years; c/ over 56 years. 3. *Gender* a/ Men; b/ Women. 4. *Work experience* a/ up to 15 years; b/ from 16 to 35 years; c/ over 36 years.	*1.Education* a/ secondary general educational level; b/ secondary special education; c/ Higher Education - BA degree; d/ Higher Education - MA degree. *2. Work experience in the specialty* a/ up to 15 years; b/ from 16 to 35 years; c/ over 36 years. *3. Specializations* a/ in the country; b/ abroad. *4.Learning and use of foreign languages* a/ English; b/ French; c/ German; d/ Russian; e/ other languages.	*1. Produced output/ BGN;* *2. Produced output per one employee/ BGN;* *3. Produced output per one person-day/ BGN;* *4. Produced output per person-day of the management staff/ BGN.*	*1. Basic payment and social security contributions* *2. Social payments* *3. Additional incentives*

Source: developed by the authors

The survey covers the period between 2016 and 2018. The data and information are collected through direct contacts, completing special reports, tables, company documentation, etc. developed for the purpose of the analysis. For the data processing and analysis the statistical package SPSS 13.0 and Microsoft Office (Word, Excel, Power Point) are implemented.

3. Results and discussion

3.1. Study on the impact of the factors for selection of management teams

The significant structural changes in the business organizations in Bulgaria over the past two decades have led to updated requirements for the managers' knowledge and skills. The improving, restoring and acquiring new knowledge and skills require time and resources. Their adequacy imposes a systematic study of the needs of the businesses and the corresponding level of education.

3.1.1. Influence of the factors Number, structure and professional experience of the management staff

The analysis of the factors Number, structure and professional experience of the management staff examines the strength of the relationship between the number of managers in the surveyed organizations, the age and gender structure and length of service of the management staff, and the economic situation as a guarantee for achieving sustainability and development of the business organizations in Bulgaria (Table 2.)

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The study shows that the total number of people employed is a factor that has a strong impact on the sustainability and development of the organizations surveyed. The strongest impact of this factor is in the group of Ltd., where a very high correlation coefficient of 0.949 is recorded at α=0.01. Of particular importance for achieving sustainability and development is the optimal number of the management staff. The proven correlation interdependence is observed in all types of economic organizations, the most significant being the influence of the factor again in the group of Ltd. – R=0.933 at α=0.01. The data presented are a proof of the positive correlation between the number of managers employed in the business organizations and the realization of profit, providing sustainability and development in them. This leads us to the conclusion that the periodic balancing of the necessary and available workforce will help to optimize the number of management and subordinate staff, which will positively affect the sustainability and development of the business organizations.

Table 2. Influence of the factors Number, structure and professional experience of management staff

Correlation coefficient / Factors	Total	ST	Ltd.	LLC
1. Number of all employed in the organization	0,897**	0,786**	0,949**	0,628*
a/ incl. management staff	0,863**	0,884**	0,933**	0,824**
2. Age groups				
a/ from 15 to 35	0,639**	0,016	0,823**	0,597*
b/ from 36 to 55 yrs;	0,682**	0,933**	0,554*	0,331
c/ over 56.	0,387	0,362	0,211	0,328
3. Gender				
a/ Men;	0,527*	0,234	0,493*	0,316
b/ Women.	0,493*	0,184	0,511*	0,108
4. Work experience				
a/ to 15 yrs.	0,776**	0,096	0,873**	0,638**
b/ from 16 to 35 yrs	0,511*	0,889**	0,458*	0,504*
c/ 36 and over	0,364	0,204	0,339	0,386
Organizations Studied, %	*100*	*37*	*27*	*36*

Source: Author's data, Note:* The correlation is proven at 0.05 levels; ** The correlation is proven at 0.01 levels

For the optimization of the number of the management personnel, carriers of the greatest potential for sustainability and development of the business organizations in Bulgaria are the managers under 35 and those of 36-55 years of age. In these age groups high correlation coefficients are reported /R=0.639 for α=0.01 for the managers from the first age group and R=0.682 for α=0.01 for those of the second age group/. The analysis of the types of organizations according to their legal structure shows a statistically proven high interdependence between the number of managers up to 35 years and the achievement of sustainable development. The significance of the age group of up to 35 years is statistically proven in the capital companies Ltd. /R=0.823 at α=0.01/ and LLC /R=0.597 at α=0.05/. In ST, the sustainability and development of the economic organizations is mainly influenced by the managers between the age of 36 and 55 /R=0.933 at α=0.01/. Average correlation coefficients are observed among managers over the age of 56. This indicates that in the surveyed of the business organizations, the competencies and skills of the young professionals are of particular importance for their economic viability and sustainable development.

Regarding the gender structure of the managerial staff in the surveyed organizations, a positive correlation is observed for both men /R=0.527 for α=0.05/ and women /R=0.493 for α=0.05/. The results are similar in the types of business organizations surveyed according to their legal structure. It is indicative that the gender of the managers has an equal effect on the sustainability and development of the studied business organizations.

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An important factor, taking into account the degree of experience, is the length of service. Its impact is very strong for managers with experience of up to 15 years with a correlation coefficient of 0.776, statistically proven at α=0.01. Managers with work experience from 16 to 35 years also have a strong direct proportional relationship with the results achieved and the development of the organizations - R=0,511 at α=0,05. The impact of this group of managers on the sustainability of the business organizations is very high at ST /R=0.889 at α=0.01/. In the case of the capital companies, the main potential for achieving good economic results is the managers with work experience of up to 15 years. This indicates that the quality of the management decisions is not always directly related to the acquired work experience. The flexible administration, innovative thinking and application of new technologies is a must for good production and economic results, ensuring sustainability and development of the companies. In most cases, these managers are young individuals with not too long professional experience.

3.1.2. Influence of the factors Educational and professional qualification profile of the management personnel

The factors included in the educational and professional profiles of the managers focus on the acquired level of education, the improvement of the professional experience and qualification, as well as the opportunities for training and self-education of the management staff in the researched economic organizations in Bulgaria. The analysis of the impact of these factors on the sustainability and development of the companies will help to build a strategy for the subsequent selection, training and development of the management teams in them.

The study of the Education factor shows that managers with higher education of Master's and Bachelor's degrees have a major impact on the sustainability and development of the studied economic organizations. (Table 3).

Table 3. Influence of the factors Educational and professional qualification profile of the management staff

Correlation coefficient / Factors	Total	ST	Ltd.	LLC
1. *Education*				
a/ secondary general;	-0,513*	-0,174	-0,611*	-0,316
b/secondary specialized;	0,170	0,003	0,204	0,011
c/ higher BA;	0,527*	0,291	0,836**	0,823
d/ higher MA.	0,711**	0,494*	0,918**	0,933**
2. *Work experience on the specialty*				
a/ to 15 yrs.;	0,626*	0,428*	0,734**	0,709**
b/ from 16 to 35 yrs;	0,643*	0,837**	0,563*	0,601*
c/ 36 and over.	0,444	0,681**	0,463*	0,033
3. *Specializations*				
a/ in the country;	0,402*	0,598**	0,584*	0,961**
b/ abroad.	0,658**	0,196	0,631**	0,994**
4. *Learning and use of foreign languages*				
a/ English;	0,564*	0,577*	0,626**	0,798**
b/ French;	0,031	0,000[nd]	0,016	0,139
c/ German;	0,193	0,108	0,206	0,166
d/ Russian;	0,301	0,169	0,423*	0,018
e/ other languages.	0,462*	0,296	0,186	0,557*
Organizations Studied, %	*100*	*37*	*27*	*36*

Source: Author's data, Note:* the correlation is proven at 0.05 levels; ** the correlation is proven at 0.01 levels;
nd – There is no data on the surveyed companies

Their significance is evidenced by high correlation coefficients, respectively, in Master's degree with R=0.711 at α=0.01 and at Bachelor degree with R=0.527 at α=0.05. This shows that the high level of education of the

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managers is a must for achieving the sustainability and development of the business organizations. The significance of this level of education is also confirmed by the types of organizations, with a stronger relationship with the capital companies - LLC with R=0.933 at α=0.01 and Ltd. with R=0.918 at α=0.01.

The professional experience is a factor which takes into account the acquired professional knowledge and skills as well as the possibility of their full application in practice. The present study shows that the most significant impact on the positive economic results is provided by the Work experience on the specialty factor of the managers from the age of 16 to the age of 35. They have a high coefficient of correlation - 0.643 statistically proven at α=0.05. The significance of this group of managers is observed in the capital companies, respectively /in the group of Ltd. with R=0.563 at α=0.05 and in the group of LLC with R=0.601 at α=0.05/, as well as in ST /0.837 at α=0.01/. The correlation of managers with internship in the specialty of up to 15 years and the achievement of sustainability and development in the studied economic organizations /R=0.626 at α=0.05/ is also statistically proven. This group of managers has a particularly strong influence on the development of the capital companies in Bulgaria. The results obtained once again confirm that professional experience is a significant factor only when combined with innovative thinking and application of new techniques and technologies in the production.

The professional-qualification profile of the management staff also examines the impact of additional training and career development for managers (Nenkov et al., 2017), (Uteubayev et al., 2018). In this sense, specializations at home and abroad are a powerful tool for professional growth and development of potential. The application of the acquired knowledge in practice has a strong impact on the achievement of sustainability and development in the business organizations. In the survey, there is a strong correlation between the realized profit and the knowledge of the managers gained from specializations in the country /R=0.402 at α=0.05/ and abroad /R=0.658 at α=0.01/. The significance of these factors for achieving sustainability and development of the studied companies is proven in the three types of economic organizations according to their legal structure.

Of particular importance for more effective communication between professionals at international level is the promotion of good foreign language skills. In this sense, the present study shows a strong interdependence between managers' knowledge and capabilities of using foreign languages and the achievement of sustainability and development of the business organizations in Bulgaria. Of particular importance is the free use and communication in English /R=0.564 at α=0.05/ and other languages /R=0.462 at α=0.05/. Similar results are also observed in the types of economic organizations, according to their legal structure. This is proof that training and the use of foreign languages is of particular value for the achievement of the sustainability and development of the companies. This knowledge enables easy access to international scientific achievements, knowledge enhancement and professional development of the managers. The adoption and application of current techniques and technologies in production leads to the sustainability of the positive economic performance in the business organizations.

3.1.3. Impact of the Factors on Employee Efficiency

The survey on the factors demonstrating the effectiveness of use of the management staff covers the results achieved in labor productivity. (Table 4). We analyzed the level of production/ BGN per one employed person and one person-day in BGN, as well as the productivity of the managerial staff in their interaction with the economic results for the achievement of the sustainability and development of the business organizations in Bulgaria.

The current analysis reveals a statistically proven strong correlation between the factors in this group and the realized profit for the survey period. For the most part, the results obtained show a significant positive correlation

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between the effectiveness of use of the employed and the economic performance as a guarantee for the sustainability and development of the businesses.

Regarding the types of organizations according to their legal form, there is a very strong correlation /R = 0.936 at α = 0.01/ of the factor Produced output per person-day by the management personnel/ BGN and the realization of profit.

Table 4. Influence of the factors Effectiveness of use of the management personnel

Correlation coefficient / Factors	Total	ST	Ltd.	LLC
1. Produced output/ BGN;	0,683**	0,238	0,814**	0,633**
2. Produced output per one employee/ BGN;	0,366	0,495*	0,331	0,217
3. Produced output per one person-day/ BGN;	0,468*	0,232	0,587*	0,365
4. Produced output per person-day of the management staff/ BGN.	0,724**	0,936**	0,663**	0,654**
Organizations Studied, %	*100*	*37*	*27*	*36*
Source: Author's data, Note:* the correlation is proven at 0.05 levels; ** the correlation is proven at levels of 0.01				

In the case of the capital companies, there is a strong impact of the factors Produced output/BGN and Produced output per person-day by the management personnel/BGN. The survey data proves that the performance of the management staff plays a key role in achieving sustainability and development of the business organizations.

3.1.4. Influence of the factors: remuneration and material incentives of the management staff

The adequate pay levels and additional material incentives are key factors in retaining skilled professionals and in developing economically viable business organizations. This necessitated the study of the impact of the basic remuneration, the social additional payments and any further stimulation on the achievement of the sustainability and development of the companies in Bulgaria (Table 5).

Table 5. Influence of the factors Remuneration and material incentives of the management personnel

Correlation coefficient / Factors	Total	ST	Ltd.	LLC
1. Basic payment and social security contributions	0,763**	0,908**	0,664**	0,536*
2. Social payments	0,168	0,223	0,069	0,117
3. Additional incentives	0,478*	0,346	0,533*	0,826**
Organizations Studied ,%	*100*	*37*	*27*	*36*
Source: Author's data, Note:* the correlation is proven at 0.05 levels; ** the correlation is proven at levels of 0.01				

With regard to management staff, the data reveal a strong interdependence between basic pay and the level of sustainability in the businesses surveyed. A statistically proven high correlation coefficient of 0.763 is reported at α = 0.01. This shows the close relationship between the economic interests of workers in the economic organizations and the performance of their activities. Good remuneration stimulates the managers to summon their mental and physical potential to achieve higher economic performance, ensuring sustainability and development of the business organizations. In this sense, the additional stimulation appears as a reward for the activity shown. Proof of this is the high correlation coefficient obtained /R = 0.478 at α = 0.05/, showing the strong correlation between the additional material incentives of the management staff and the economic status of the organizations.

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Regarding social co-payments, the study shows a low impact of this factor on the economic performance of the surveyed organizations. This low impact mainly applies to capital companies.

3.2. Modeling of the factors for selection of a management team, which directly or indirectly influence the sustainability and development of the business organizations

In order to study the impact of both the direct and the indirect correlations of the factors for selection of the management team, ensuring the sustainability and development of the economic organizations in Bulgaria, the Path-analysis method is applied. This method evaluates only those factors which have the most impact and the weak ones are eliminated. The results obtained from the Path analysis of the management personnel of the surveyed economic organizations are shown in Table 6.

Table 6. Direct and indirect effect of the factors for selection of the management team, which are particularly important for achieving the sustainability and development of the companies

Path-coefficient / Factors	Direct impact	Indirect impact
1. Total number of employed	1,033	-0,136
2. Total number of managers	0,655	0,208
3. Managers aged 15 to 35	-0,124	0,763
4. Managers aged 36 to 55	0,495	0,187
5. Work experience to 15 years	-0,340	0,966
6. Work experience from 16 to 35 years	0,505	0,138
7. Higher education - MA	0,472	0,239
8. Higher education - BA	0,844	-0,317
9. Specialized at home	0,633	-0,231
10. Specialized abroad	0,481	0,177
11. Proficiency in English	0,243	0,321
12. Output	-0,329	1,012
13. Output for one person-day	0,829	-0,361
14. Output per one person-day of the managers	0,677	0,047
15. Basic pay and social security	0,390	0,373
16. Additional incentives	0,789	-0,311
Source: Author's calculations		

The data in the table show that some of the factors have a positive direct and indirect impact on the sustainability and development of the organizations. Such factors are assessed as highly positive. These are the factors related to the total number of managers in organizations aged 36 to 55, with professional experience of over 16 years, holders of Master's degree, fluent in English and specialized abroad. The factors related to the basic remuneration and the productivity of the managers' work are also very positive.

The factors related to the total number of persons employed in the business organizations as well as the managers with a Bachelor degree, specialized in the country, have a direct positive effect on the sustainable development of the studied organizations in Bulgaria. Factors linked to the labor productivity per person-day and the further stimulation of managers are also directly positive. However, the indirect impact of this group of factors on ensuring sustainability and development of the companies is negative. The third group of factors to which pertain the produced output/ BGN as well as the managers aged 15 to 35 years, with work experience of up to 15 years, have a direct negative impact on the achievement of sustainability and development in the studied organizations. By contrast, the indirect influence of these factors is highly positive. The indirect impact is higher than the direct one and the final impact of these factors is also positive.

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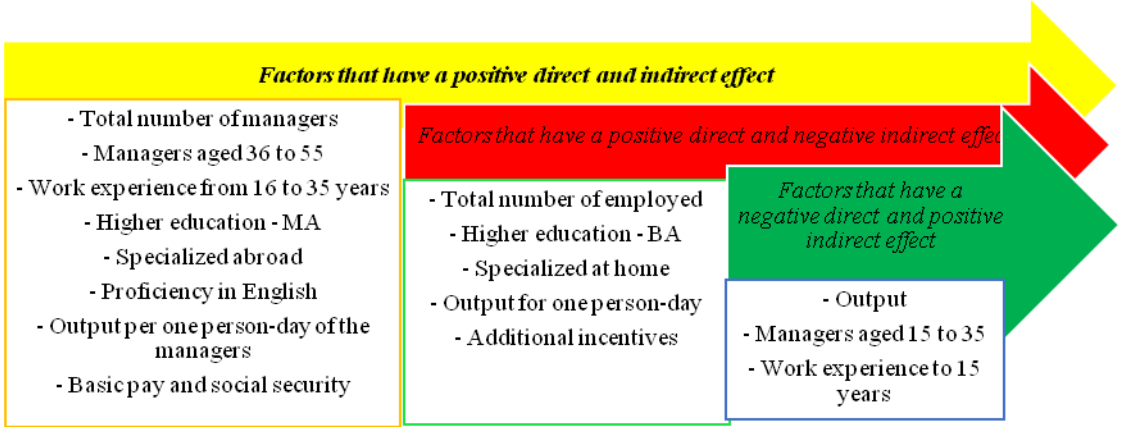

Fig. 2. Model of the factors for selecting a management team in the economic organizations

Source: Author's own study

A model of the main factors, which have a direct and indirect impact on the selection of a management team ensuring the sustainability and development of the economic organizations is preented in Figure 2.

The modeling of factors for the selection a management team, as well as their effect and interaction for the achievement of sustainability and development of the business organizations, is of paramount importance for the development of a system of selection, training and professional development. The construction of the system is an important prerequisite for increasing the efficiency of the management leading to the achievement of the sustainability and development of the businesses in Bulgaria.

The implementation of the system demonstrates the effectiveness of the practical application of the main activities for selection of a management team as well as their effect and interaction in achieving the sustainability and development of the business organizations. It ensures the observance of the causal relationships between the different components of the system, which contributes to their harmonious interaction. Their implementation has helped to improve communication and relationships among all those working in the business organizations. By increasing the motivation of the human resources is reached a better performance of the labor tasks. The achieved result of the activities performed is in fact the implementation of a regulated and effectively functioning system for selection, training and professional development of the management team guaranteeing the sustainability and development of the business organizations.

Conclusions

In today's conditions, where knowledge, skills and competencies become the mainstay of the business organizations' development, the role of an efficient management team is ever growing. Not only formal education, but also its quality and its adequacy to the current and future needs of the economy, are of paramount importance. That is why creating a good management team is a complex system of interrelationships and dependencies among a number of factors. They have a direct or indirect impact on the results of the production activity in the companies. The current study and the analysis of the factors for selecting a management team ensuring the sustainability and development of the economic organizations in Bulgaria leads to the following conclusions:

- The number of employees in the business organizations is a factor which has a strong impact on the sustainability and development of the business organizations in Bulgaria. Of particular importance for the positive economic performance is the optimal number of the management personnel, so it is important to periodically adjust the balance of the required and available workforce.

- Holders of the greater potential for sustainability in the businesses in Bulgaria are the management staff of up to the age of 55. The competencies, skills and knowledge of the young managers are the better prospect for economic vitality and development of the business organizations.

- The high educational and professional qualification degree of the management staff is a necessary condition for increasing the production and economic results and achieving the sustainable development of the business organizations in Bulgaria. Professional experience is a significant factor only when combined with innovative thinking and application of new techniques and technologies in production. Specializations in the country and/ or abroad are factors which have a positive impact on the professional development of the managers. They also help to better learn foreign languages and make communication more effective among professionals. This knowledge allows for easy access to international scientific achievements, ensuring a constant updating of the knowledge and professional development of the managers. The adoption and application of latest techniques and technologies in production leads to positive economic performance in the business organizations.

- Good remuneration levels and additional ways of material incentives are key factors for retaining skilled professionals and developing economically viable business organizations. This factor is particularly important during an economic crisis when the material incentive prevails and overrides the other motivating incentives.

References:

Bogomolov, A., Nevezhin V. and L. O. Chagovets. (2018). Using Econometric Modeling in Likelihood Assessing of Investment Activity Risks. *2018 IEEE First International Conference on System Analysis & Intelligent Computing (SAIC)*, Kiev, pp. 1-5. http://doi.org/10.1109/SAIC.2018.8516898

Dyachenko, Yu., Nenkov, N., Petrova, M., Skarga-Bandurova, I., Soloviov, O. 2018. Approaches to Cognitive Architecture of Autonomous Intelligent Agent. Biologically Inspired Cognitive Architectures, Elsevier, 26,130-135, ISSN: 2212-683X

Koval V., Polyezhaev Y., Bezkhlibna A. (2018). Communicative competences in enhancing of regional competitiveness in the labour market. *Baltic Journal of Economic Studies*, 4(5), 105-113. http://dx.doi.org/10.30525/2256-0742/2018-4-5-105-113

Kuzmin, E.A., Vinogradova, M.V., Guseva, V.E. (2019). Projection of enterprise survival rate in dynamics of regional economic sustainability: case study of Russia and the EU. *Entrepreneurship and Sustainability Issues*, 6(4), 1602-1617. https://doi.org/10.9770/jesi.2019.6.4(4)

Koval, V., Duginets, G., Plekhanova, O., Antonov, A., Petrova, M. (2019). On the supranational and national level of global value chain management. *Entrepreneurship and Sustainability*, 6(4), 1922-1937. http://doi.org/10.9770/jesi.2019.6.4(27)

Labunska, Sv., Petrova, M., Prokopishyna, O. (2017). Asset and cost management for innovation activity. *Economic Annals–XXI*, 165 (5-6): 13-18. https://doi.org/10.21003/ea.V165-03

Mentel, G., Szetela, B., Tvaronavičienė, M. (2016). Qualifications of managers vs. effectiveness of investment funds in Poland, *Economics & Sociology*, 9(2), 126-137. https://dx.doi.org/10.14254/2071-789X.2016/9-2/8

Nenkov, N.., Sushchenko, O., Dyachenko, Y. (2017). Role of chief information officer within the system of human resource development in service organizations (tourism). *Economic Annals-XXI*, 165(5-6), 97-103.

Odinokova, T., Bozhinova, M., Petrova, M. (2018). *Promotion of Innovative Entrepreneurship Under Sustainable Development*. E3S Web Conferences, Volume 41, 04015. IIIrd International Innovative Mining Symposium, Kemerovo, Russian Federation, https://doi.org/10.1051/e3sconf/20184104015

Petrova, M., Tepavicharova, M., Boykova, L. (2018). *Possibilities for human capital development in the mining and quarrying sector in Bulgaria.* E3S Web of Conferences Volume 41, 04017, IIIrd International Innovative Mining Symposium, Kemerovo, Russian Federation, https://doi.org/10.1051/e3sconf/20184104017

Pukala, R. (2016). Use of neural networks in risk assessment and optimization of insurance cover in innovative enterprises. *Engineering Management in Production and Services*, 8(3): 43-56.

Pukala, R., Sira, E., Vavrek, R. (2018). Risk management and financing among start-ups. *Marketing and Management of Innovations*, 3, 153-161. http://doi.org/10.21272/mmi.2018.3-13

Strizhkova A. (2019). *Open innovation as trend in terms of digitalisation*. International conference proceedings 26 February 2019 (Kharkiv). Scientific Research Institute of Providing Legal Framework for the Innovative Development of the National Academy of Legal Sciences of Ukraine. Ed. Glibko Sergiy, Lubchich, A, Dmitrik, O. pp.114-117. URL: http://ndipzir.org.ua/wp-content/uploads/Zbirnuk%2026.02.19.pdf

Sushchenko, O., & Trunina, I. (2016). Creation of Innovation Clusters as a Line of Enterprise Competitiveness Improvement in the Field of Foreign Economic Activity. *Actual Problems of Economics*, 177(3), 191-198.

Sushchenko, O.A., Trunina, I.M., Zagirniak, D.M. (2017) Determination of electrical engineering business entity's core fields of competence as sources of its competitive advantages. Proceedings of the International Conference on *Modern Electrical and Energy Systems (MEES)*, Kremenchuk, Ukraine, c. 344-347. http://doi.org/10.1109/MEES.2017.8248928

Tumalavičius, V., Veikša, I., Načisčionis, J., Zahars, V., & Draskovic, V. (2017). Issues of the state and society security (part i): ensuring public security in the fight against crime. J*ournal of Security & Sustainability Issues*, 6(3): 401-418. http://doi.org/10.9770/jssi.2017.6.3(7)

Uteubayev, T., Petrova, M.M., Lyubenova, I. 2018. *Training of qualified specialists in the process of their education at the university: the role of the public-private partnership.* CBU International conference proceedings 2018: Innovations in Science and Education Book Series: CBU International Conference Proceedings Pages, pp.491-495, ISSN 1805-997X (Print), ISBN 978-80-270-5037-6 (Print edition). E-ISSN (Online ISSN 1805-9961). http://dx.doi.org/10.12955/cbup.v6.1203

Uteubayev, T. (2015). *Management motivation in the companies in Kazakhstan.* CBU International conference on innovation, technology transfer and education, Vol. 3, p. 150. http://dx.doi.org/10.12955/cbup.v3.596

Uteubayev, T., Petrova, M.M. (2017). The Development Of Human Potential In Kazakhstan's Innovation Economy. *Business Management*, issue 4, Tsenov Academic Publishing House, Svishtov, pp.75-89, https://www.ceeol.com/search/article-detail?id=608979

Zahars, V., Stivrenieks, M. (2018). Security, surveillance and re-socialization aspects in Center for drug addicts of Olaine City Prison in Latvia. *Journal of Security and Sustainability Issues*, 7 (4), 643-656. https://doi.org/10.9770/jssi.2018.7.4(3)

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EVALUATION OF COMPETITIVENESS FACTORS OF INSURANCE COMPANIES*

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Abstract. The effective functioning of the insurance market is one of the internal factors of the progressive development of the domestic economy. The role of insurance is constantly increasing, because insurance reduces risks in all spheres of economic activity, guarantees the preservation of income and savings, provides the ability to use the available funds of the insurance fund as an additional source of investment. Comparative analysis of the concepts of competitiveness and existing methods of assessing the level of competitiveness suggests that the concept of competitiveness is perceived by many scientists, experts, is ambiguous, has a rather broad interpretation. At the present stage, in the conditions of integration, a study of the competitiveness of insurance companies is relevant. This article discusses the theoretical aspects of ensuring the competitiveness of insurance companies, in particular, gives a generalized description of the concept of competitiveness, considers a methodology for assessing the competitive advantages of insurance companies, identifies factors and basic conditions for its provision. Benefits of insurance organizations through a "polygon is competitive STI "demonstrates the competitive position of companies in the market of insurance uslug. On the basis of this methodology analyzes Kazakh activity of insurance companies, determined by their development problems and propose a set of measures aimed at solving problems that are fundamentally important for the successful operation of insurance companies.

Keywords: insurance; risk; assessment; competetiveness

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JEL Classifications: G22, G32.

1. Introduction

The development of the insurance industry is influenced by a combination of macroeconomic and microeconomic factors, the conditions for economic integration and the consequences of the financial crisis. Under these conditions, the role and place of the national insurance market in an integration association to a certain extent depends on its ability to function effectively and to be competitive (Sembekov, Serikova 2017). Therefore, today it is relevant to assess the development of the insurance market in Kazakhstan in order to determine the prospects for its competitiveness. Criteria for assessing the competitive environment and competitive opportunities of insurance companies should be selected based on objective macroeconomic indicators, taking into account the influence of the microeconomic level of the activities of insurance companies (Sembekov, Serikova 2015). Competitiveness in the insurance sector in a market economy is a generalizing characteristic of the insurance industry, reflecting the level of efficiency of use of economic resources relative to the efficiency of use of economic resources by competitors (Vorotnikov 2016).

2. Literature review

According to some scientists, competitiveness is defined as "the ability to produce and consume goods and services in a competitive environment with goods and services produced in other countries, and the result of competition should be a rise in the standard of living of the population while observing international environmental standards" (Vorotnikov 2016).

It can be noted that the understanding of competitiveness lies in "finding the main characteristics of a state that gives its companies the opportunity to seek and maintain competitive advantages in certain areas, this is a search for competitive advantages in different countries" (Shekhovtseva 2015).

Quite interesting is the definition of competitiveness proposed by Michael Storper, who believes that the competitiveness of an economy is its ability to attract and retain firms with stable or growing market shares to continue their activities while maintaining or improving the standard of living of everyone who participates in this activity (Valisieva 2016).

The definition of the domestic academician U. Baimuratov (Baimuratov 2016) noted that the competitiveness of the national economy means the ability of the economic system to meet the reasonable material and spiritual needs of people in a competitive environment in domestic and foreign markets for goods and services in compliance with international environmental standards. Competitiveness is not an end in itself, but only a means of improving the quality of life (Porter 2016).

According to professor L. Blyakhman, "competitiveness is the ability to maintain and increase its share in the value added created in this segment of the world or national market of goods and services, the ability to develop and effectively use its competitive advantages" (Blyakman 2018, p.35).

Evaluation of the competitiveness of an organization can be carried out only among enterprises belonging to the same industry, or producing the same goods or services. The competitiveness of an organization largely depends on how well the firm can adapt to the changing conditions of competition in the market. In contrast to the competitiveness of a product, the competitiveness of an organization cannot be achieved in a short period of time. The competitiveness of the organization is achieved with a long and flawless work in the market. From this we

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can conclude that a company operating a longer period of time in the market has great competitive advantages over only entering the given market or operating for a short period of time on it. In other words, the competitiveness of an organization determines its competitive advantages. Competitive advantages, in turn, are divided into external and internal. The organization is not able to influence external factors, but internal factors are almost entirely controlled by the management of the organization, or rather, the organization's management has all the necessary conditions to control these factors. Achieving the internal competitive advantages of the organization is carried out by staff, with a special role assigned to the head.

3. Methodology

Based on the essential characteristics of this concept of competitiveness, we can draw the following conclusions:
1) competitiveness acts as the main effective tool of the national economy in raising the level and quality of life of the population;
2) competitiveness is characterized by a high level of development of scientific and technical potential based on high innovations;
3) the ability of national manufacturing enterprises to manufacture and supply goods and services to markets through the use of their competitive advantages that meet the requirements of consumers from foreign and domestic markets;
4) a high level of productive factors of production in the country, respectively, high productivity of resource use;
5) the country's ability to achieve high economic growth in the medium term and is characterized by a high level of social development and economic growth in the country in the long term;
6) competitiveness of an economy is its ability to withstand competition, to maintain stable or growing segments in the sales markets of the world, regional or national markets for goods and services.

To analyze the competitiveness of insurance companies, the most complete set of key factors is needed that influence the organizational, economic, and financial parameters that characterize its competitiveness. To assess the factors of competitiveness, we used the "polygon of competitiveness" method based on the use of inter-firm analysis proposed by V. Moshnov (Moshnov 2015).

Taking into account the specifics of the object of study, this method should be adjusted since the competitiveness of an insurance organization, as noted above, depends on the competitiveness of its financial and economic activities and the competitiveness of the insurance services provided by it.

Thus, the "polygon of competitiveness" in this perspective will consist not only of the competitiveness factors of the insurance service, but also of the financial and economic factors of the competitiveness of the insurance organization.

Evaluation of competitiveness in the form of a geometric figure, clearly characterizes the real competitive position of the insurance company in the insurance market. Moreover, the vectors of the axes of the polygon correspond to the number of financial and economic factors selected for analysis, the value of which improves with distance from its center (Zhuk 2015).

The generalized estimated parameter of competitiveness as a cumulative effect of all competitive advantages incorporated into the model is defined as the area of the polygon built on the axes vectors correlated with the indicators of the level of these competitive advantages.

In addition to the price of the service, the parameters that characterize its attractiveness for a client of a company are its properties that manifest themselves directly in contact with the insured at any stage of the insurance process: from sale to insurance payment. The results of this interaction should suit the insured, both in substance

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and in form. The parameters of insurance services assessed by the insured include the following financial factors of competitiveness: the size of insurance premiums; the variety of insurance products offered by the insurer; the level of insurance payments, suggesting an effective system of claims settlement (Moskaleva 2014).

The analyzed financial and economic factors include: a variety of insurance products (types of insurance), regional networks (number of branches), a sufficient amount of assets of an insurance organization, a sufficient amount of capital, reserves, the amount of insurance payments and insurance premiums. They fully allow to characterize the competitiveness of an insurance organization from the position of its financial and economic components (Kirillova 2016).

4. Application functionality

The competitiveness of the insurance organization, determined by the influence of factors or the relationship between them, is combinatorially great. This circumstance essentially characterizes the specificity of factors and imposes a number of limitations in the process of their study. The concept of "combinatorial" should be defined as the presence of any factors in the system of a variety of combinations of connections and variants of relations between them that can dynamically change their state.

Therefore, to study the most complete set of factors of competitiveness of insurance organizations, we turn to the main indicators of competitiveness (2019).

In economic theory, there are four main indicators characterizing the size of the insurance organization relative to the size of the market. These indicators include:
- the share of sales of the company in the market volume of sales;
- the share of the value of the assets of the company in the value of the assets of all firms operating in the market;
- the share of employees in the enterprise in the number of people employed in the production of this product;
- the share of value added at the enterprise in the amount of added value of all manufacturers operating on the market (Nabieva 2013).

In relation to the insurance market in domestic practice, only the first two indicators are used.
In modern studies on the competitiveness of organizations, concentration indicators are classified as follows:
1. Using absolute concentration indicators assess the number of enterprises in the market and market share per one company or group of companies.
2. Using relative indicators that assess the variability of market entities, uniform distribution of shares and the ratio of the sizes of individual entities to each other (Chernykh 2017).
The variety of methods for assessing the competitiveness of organizations is associated not only with the lack of a single terminological base, but also with the fact that competitiveness assessment is usually carried out in relation to various market entities. Moreover, each of the subjects is guided by its own assessment criteria, depending on the objectives pursued (Spletukhov 2015).

Since the assessment of the competitiveness of each of the compared insurance organizations can be interpreted through the area of geometric figures - polygons of competitiveness (SNC), then when conducting intercompany comparisons of competitive advantages for each insurance organization we get:

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$$SH_{ci} = \frac{1}{2} \sin \alpha \text{ x } (K_1 \text{ x } K_2 + K_2 \text{ x } K_n \ldots + K_n + K_{n-1}$$

where:

SH_{ci} – polygon area of competitiveness of an insurance organization (economic activity or insurance service);

$K_1 - K_2$ – estimated parameters of competitive advantages included in the model.

SH_{ci} for the factors analyzed in this article, the equation will be:

$$SH_{ci} = \frac{1}{2} \sin \alpha \text{ x } (K_a \text{ x } K_c + K_r \text{ x } K_{pi} + K_p + K_{pr} + K_{pr} \text{ x } K_p + K_p \text{x } K_{pr} + K_{pr} \text{ x } K_{reg})$$

where:

K - indicative of competitive advantage, including:

K_a – assets of the insurance organization;

K_c – capital insurance organization;

K_r – sufficiency of reserves of the insurance organization;

K_{pi} – premiums of the insurance organization;

K_p – the level of insurance payments;

K_{pr} – variety of insurance products;

K_{reg} – availability of regional networks.

In order to determine the competitiveness of the proposed method, we will analyze the insurance organizations operating in the general insurance industry, including: IC Eurasia, IC Victoria, NOMAD LIFE, and Halyk Bank of Kazakhstan "Halyk - Kazakhinstrakh", JSC "Life Insurance Company" Kazkommerts-Life "(subsidiary JSC" Kazkommertsbank "), JSC "Halyk-Life", JSC "IC Kazkommerts-Policy", JSC State Annuity Company JSC, IC JSC Kazakhmys, JSC StandardLife JSC based on statistical reports (2019).

The analysis of factors of competitiveness of the leading Kazakhstan insurers is based on official financial reporting data. Baseline data for analysis are presented in Table 1. As a baseline, indicators of financial and economic factors of the insurance company Standard-Life Insurance Company JSC were used.

Table 1. Baseline data for the calculation of the estimated indicators of the factors of competitiveness of insurance organizations for 2017

Name of company	Value of assets	Insurance reserves	Amount of capital	Amount of insurance payments	A variety of insurance products	Insurance premiums	Regional Networks
JSC IC “Eurasia”	202156 320	86 866 537	112 237 363	23 557 557	27	48 999 187	13
JSC IC “Victoria”	86 388 036	6 139 240	80 082 850	528 491	16	4 124 197	12
JSC KIL "NOMAD LIFE"	56 945 933	46 428 629	9 055 759	4 335 399	6	17 411 199	16
JSC “Halyk Kazakh Instrakh”	55 487 119	20 014 994	29 122 972	8 089 633	26	36 388 290	18
JSC “Company of life insurance” "Kazkommerz - Life"	54 773 934	45 706 939	7 085 344	4 865 876	6	13 441 292	16
JSC of Halyk bank of life insurance “Halyk life”	48 400 715	36 346 673	8 768 343	2 487 119	6	24 431 321	17

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JSC IC “Kazkommerz police”	38 275 319	11 959 377	20 995 895	3 316 483	25	16 331 508	18
JSC "State Annuity Company "	33 500 388	27 328 367	6 043 691	2 088 326	4	2 113 892	15
JSC IC “Kazakhmys”	30 996 502	21 614 030	7 941 187	1 930 035	25	45 026 554	9
JSC "StandardLife"	21 060 884	16 945 871	3 716 121	1 105 294	6	8 432 650	18

Source: compiled by authors according to the source of National bank

The results of calculations of estimated indicators of factors of competitiveness of insurance companies are shown in table 2.

Table 2. Indicators of factors of competitiveness of insurance companies in Kazakhstan

Name of insurance company	Ka	Kr	Kc	Kp	Kpr	Kpi	Kreg	SHci
JSC IC “Eurasia”	9,60	5,13	30,20	21,31	4,50	5,81	0,72	8,52
JSC IC “Victoria”	4,10	0,36	21,55	0,48	2,67	0,49	0,67	0,20
JSC KIL "NOMAD LIFE"	2,70	2,74	2,44	3,92	1,00	2,06	0,89	0,28
JSC “Halyk Kazakh Instrakh”	2,63	1,18	7,84	7,32	4,33	4,32	1,00	1,09
JSC “Company of life insurance” "Kazkommerz -Life"	2,60	2,70	1,91	4,40	1,00	1,59	0,89	0,24
JSC of Halyk bank of life insurance “Halyk life”	2,30	2,14	2,36	2,25	1,00	2,90	0,94	0,20
JSC IC “Kazkommerz police”	1,82	0,71	5,65	3,00	4,17	1,94	1,00	0,39
JSC "State Annuity Company "	1,59	1,61	1,63	1,89	0,67	0,25	0,83	0,09
JSC IC “Kazakhmys”	1,47	1,28	2,14	1,75	4,17	5,34	0,50	0,35
JSC "StandardLife"	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,05

The “polygon of competitiveness factors” constructed on the basis of the calculations made is presented in Figure 1.

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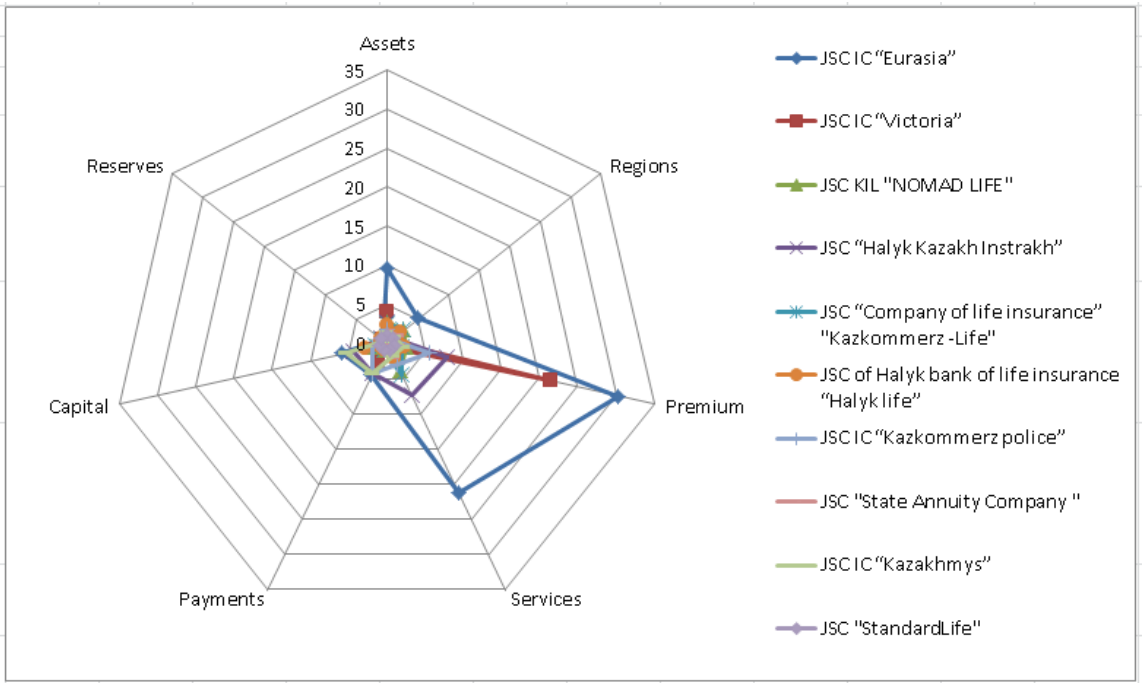

Figure 1. Polygon of competitiveness factors**.**
Source: compiled by authors

Thus, as can be seen from Figure 1, the insurance market leaders are insurance companies: Eurasia Insurance Company JSC, Halyk-Kazakhinstrakh Insurance Company JSC People's Bank of Kazakhstan, Kazkommertsbank Insurance Company JSC (Kazkommertsbank JSC subsidiary). As we can from the Figure 1, these results is based on the following solutions:

- occupied market share,
- industry growth rate,
- intensity of competitive rivalry and others.

The degree of stability of the company's competitive position in the market is calculated using an indicator - market share, the value of which should be determined and predicted. Market share is the ratio of the sales volume of a particular product of a given enterprise to the total sales volume of a given product carried out by all entities operating in this market. A company (company) can achieve competitive advantages and strengthen its position by:

- ensuring lower costs for the production and marketing of goods;
- ensuring the indispensability of the product through differentiation.

The competitiveness of which is, respectively: 8.52; 1.09 and 0.39. According to the figure 1, these results had been accomplished. Summing up, it should be noted that the above method allows to explore not only the factors affecting the competitiveness of insurance companies, but also to assess the effects of their changes in the future, as well as their impact on the competitive position of companies in the insurance market.

Thus, the analysis of changes in the structure and growth dynamics of insurance premiums and payments allows us to draw the following conclusions: this sector of the economy is at a growth stage. At the same time, in the

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near medium term, we assume a slowdown in the growth rate of the insurance sector due to the fact that the economy of Kazakhstan began to recover gradually.

Conclusions

Our analysis shows that the level of competitiveness of Kazakhstan insurance companies is insufficient. The possibilities of insurance organizations are gradually increasing, but remain very limited so far. The previously adopted programs for the development of the insurance market remain unfulfilled, achieving the ratio of insurance premiums to GDP of up to 2% was assumed at the beginning of the second half of the last decade, but over the past 5 years, this indicator has not only not increased, but decreased.

Our analysed indicators show that in the near future insurance companies would be under tremendous pressure from other segments of the financial market (currency fluctuations, stock market volatility, license reviews and a sharp decline in the banking market). The falling incomes of the population and the unstable dynamics of the real sector also affect the situation in the insurance and reinsurance markets. It is obvious that national economies and insurance sectors, as integral parts, cannot develop independently of each other with different growth vectors. The state of the national economy affects the quality of insurance development, the demand for insurance services, and, accordingly, the development potential of the insurance market.

Competition of economic communities for attracting a taxpayer stimulates the application of similar approaches to the formation of tax systems within a particular community. At the same time, tax harmonization should not only preserve certain features of tax regulation, but should objectively aim at the medium term to lead to the complete standardization of tax systems and the procedure for levying taxes and fees.

Activization of insurance is possible only after the general revival of the economic situation. Further development of the insurance market will also largely depend on direct state support for the processes of integration of domestic insurers, the provision of a particularly favorable tax regime, improvement of business processes of insurance companies, namely the use of modern forms of insurance marketing, the active introduction of new insurance services and products
.
Thus, in our opinion, the practical implementation of our proposed set of measures and proposals for improving the activities of insurance companies in Kazakhstan will increase the competitiveness of the national insurance market.

References

Blyakman, L.S., Abisheva, A.A. 2018. Competitiveness: theory, methodology, practice. Almaty. 259p.

Baimuratov, U. 2016. Science of global economy. Almaty. 136p.

Chernykh, M.N., Azemsha, E.A. 2017. Methodology for determining the financial stability of an insurance company. Taxation, accounting and reporting in an insurance company, 4(17): 24-27.

Kirillova, N.V. 2016. Risk Management Systems in Insurance Organizations. World of the New Economy, 3(14): 116-123.

Moshnov, V.A. 2015. A comprehensive assessment of the competitiveness of an enterprise. Corporate Management, 5(2): 122-133.

Moskaleva, E. G. 2014. Methodological approaches to the analysis of funds according to the financial statements of the insurance company. Economic analysis: theory and practice, 45(396): 50–61.

Nabieva, A. 2013. Insurance market of Kazakhstan: problems and development prospects. KAZENERGY Magazine, 1(56): 68-73, http://www.kazenergy.com

National Bank of the Republic of Kazakhstan. 2019. Current Status of the Insurance Sector of the Republic of Kazakhstan, http://www.nationalbank.kz.

Porter, M. 1993. International Competition. Moscow. 896p.

Porter, M. 2016. Competition. Moscow. Williams Publishing House. 608p.

Samiev, P.A. 2018. The structure and effectiveness of investments of insurers. Auditor, 10(31): 94-102.

Sembekov, A.K., Serikova, G.S. 2015. Factors and conditions of the competitiveness of the insurance market in the conditions of the EAEU integration. Karaganda. 168p.

Sembekov, A.K., Serikova, G.S. 2017. Competitiveness of the national insurance market in the conditions of integration of the Eurasian Economic Union. Karaganda.182p.

Serikova, G.S. 2015. On the development of the insurance market of the Republic of Kazakhstan. International Scientific Journal "Symbol of Science", 6(13): 147-149.

Shekhovtseva, A. 2015. Competitiveness of the region: factors and method of creation. Marketing in Russia and abroad, 4(9): 11-15.

Spletukhov, Yu.A. 2015. Regulation of insurance activity in the EAEU countries: similarities and differences. Research Financial Institute. Financial Journal, 3(11): 86-90.

Spletukhov, Yu.A., Dyuzhikov, E.F. 2015. Indicators of the analysis of the financial condition of the insurance organization. Auditor, 6(34): 31-33.

US Competitiveness in the World Economy. 1985. Boston: Harbard Business SchooL Press. 14-16.

Vasilieva, Z.A. 2016. The hierarchy of concepts of competitiveness of market entities. Marketing in Russia and abroad, 2(24): 10-12.

Vorotnikov, A. 2016. Strategies to increase the competitiveness of the region. Economic strategies, 6(11): 144-149.

Zhuk, I.N. 2015. Competitiveness of the insurance company as an object of management. Insurance business, 5(11): 78-82.

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INSTITUTIONAL CONDITIONS OF INTERACTION OF FINANCIAL-CREDIT AND INNOVATIVE ECONOMIC SECTORS

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Abstract. In this article, the authors consider one of the most important issues in the development of the Kazakhstani economy - strengthening the innovation component, capable of ensuring economic growth regardless of export revenues of the oil and gas sector of the country. According to the authors, the solution of this strategic task directly depends on the vector of state regulation, which should be characterized by integration and proportionality in ensuring more active and productive interaction of subjects of financial and credit and real (including innovation) sectors of the economy. In this regard, the authors, based on the use of a systems approach and the theory of institutionalism, carried out economic and mathematical modeling on data from a number of countries, allowing to determine the degree of influence of regulatory institutional measures on the quality of interaction between the subjects of these sectors. The obtained results allowed formulating a number of conclusions that can be a starting point in terms of improving the current regulatory system in the Republic of Kazakhstan.

Keywords: Financial - credit sector, real and innovative sector, system of state regulation, interaction, economic development

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1. Introduction

The evolution of world economic systems over the past decades indicates the emergence of trends associated with increased external shocks, market volatility, a slowdown in economic growth, a weakening of ties between material production and the financial and credit sector, and the excessive reliance of the authorities on the impact of regulatory measures on financial stability and economic development in whole. In turn, these phenomena have led to a concentration of risks in both the financial and real sectors amid tightening of regulatory requirements for

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financial and credit organizations, an intensive consolidation process in the banking sector and predominant government support for systemically important market players, which further delays these sectors from active and effective interaction. This thesis is confirmed by a comparative assessment of the degree of participation of financial and credit sector entities in the development of innovations in Kazakhstan with similar indicators in foreign countries: 1) the share of innovation-active enterprises of the total number of business entities following the results of 2018: in Kazakhstan it is no more than 10%, while in Germany - 79%, in Sweden - 60%, in France - 54%, in the UK - 45%; 2) the share of real sector enterprises engaged in technological innovation of their total number at the end of 2018: in Kazakhstan also does not exceed 10%, while in Germany - 64.2%, in Belgium - 60%, in Sweden - 48.5%, in the Netherlands - 47.1%, in Finland - 46.4%, in Austria 43.9%, in the UK - 32.7% (2019).

The development of the economy of the Republic of Kazakhstan according to the model of industrial-innovative development takes place in the context of one of the main priorities of the state regulation policy, which is aimed at ensuring the sustainability of the national economy in the context of global turbulence and competition. It is about building up the innovative potential of the country, active generation and practical application of innovative achievements and technologies, the results of which can be used to ensure sustained economic growth. In particular, the President's Address to the People of Kazakhstan "Third Modernization of Kazakhstan: Global Competitiveness" states the need to create a new model of economic development that can increase the country's competitiveness in world markets, including through industrial modernization and the use of digital technologies (2019).

The relevance of the implementation of the model of industrial-innovative development is due to the participation of external shocks, volatility in the commodity and financial world markets, a significant reduction in economic growth, asymmetric position of the financial and credit and real sectors of the economy, low efficiency of regulatory measures in terms of enhancing the interaction of these sectors and many others. Unfortunately, all these factors not only do not contribute to the active interaction of the financial and real sectors of the economy, but further alienate them from each other. Attempts to stimulate business activity in the economy are still insufficient, which affects the persistence of problems and contradictions in the process of interaction between sector actors, as evidenced by macroeconomic indicators. So, if in 2001 the growth rate of GDP in Kazakhstan reached its historical maximum of 13.5%, then by the end of 2018, the value of this indicator decreased to 4.1% (2019). At the same time, the level of annual inflation did not change significantly over the same period, amounting to 8.4% and 6.1% for the same periods, respectively (2019).

The existing conditions of vital activity of the subjects of the interacting sectors - persisting inflation, high cost of financial and credit resources provided on a long-term basis to enterprises with a long duration of production and innovation cycles, weak technical and technological component of most small and medium enterprises (except for the giants of the national industry, whose products are focused on exports and those that are managed by foreign investors are actually and representing transnational companies), high risks in both sectors, strict regulation of financial market entities require the improvement of the regulatory system of financial and credit entities in order to increase their financial support for the real and innovative sectors of the economy against the background of the institutional vacuum.

As the situation shows, the further effective development of small and medium-sized enterprises (SMEs) is constrained by significant financial deficiencies, which include insufficient amounts of financial support. The market economy is characterized by a multiplicity of sources of financial support for production costs, forms and methods, principles and conditions of financing. Optimization of the relationship between forms of financial security is carried out by the state through its financial policy (Bekaert, Lundblad 2015; Uakhitzhanova et al. 2017).

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2. Methodological approach

The methodological basis of this study is the work of scientists in the field of the development of theories: systems, finance, credit, interaction, information asymmetry, institutionalism and state regulation of the economy. Using a systematic reproduction approach in the study allows you to show the process of interaction between the financial and credit and real (including innovative) sectors of the economy as a set of functioning elements of the economic system that influence each other as a relationship between the whole and its individual parts and confirm the thesis that quality the latter's interaction largely determines the sustainable development of the modern economic system (the impact of macroeconomic trends on the economic development).

Simultaneously, the study is also based on the development of the founders and followers of the theory of institutionalism, whose attention is focused on the analysis of the conditions that determine the viability of the mechanisms for coordinating the interests of fully functioning and developing economic entities, as well as the state and society.

It should be noted that the connection between the two methodological paradigms is due to the fact that it is the institutions that determine not only the flow, but also the nature and boundaries of the ongoing economic processes, ensure the integration of the public whole, smooth out the conflicting interests of many system elements (in this case, the subjects of financial and credit real (innovative) sectors and the state), which, ultimately, determine the stability of the functioning of both the elements themselves and the uniform of megaeconom system.

3. Materials and methods

The study used the method of economic-mathematical modeling to determine the degree of influence of institutional factors on the activity of financial institutions in the innovation sector of the economy. At the same time, the analysis of the scientific literature indicates the ambiguity of the impact of financial intermediaries on economic growth. So, F. Rioja, N. Valev (Rioja, Valev 2014) emphasize the nonlinear nature of the interaction of the financial system and economic growth. According to the authors, there are three groups of countries depending on the level of development of the financial system, in which the impact of financial intermediaries on economic growth is different: 1) in countries with a low level of financial intermediation, improvements in the financial sector do not affect economic growth; 2) in countries with an average level of financial development, even small improvements in the financial sector have a significant positive effect on economic growth; 3) for countries with a high level of financial intermediation - the effect is positive, but insignificant.

Authors such as L. Deidda, B. Fatia (Deidda, Fatia 2015) note a nonlinear and non-monotonic relationship between the level of concentration in the banking sector and the rate of economic growth. At the same time, on the one hand, increased specialization and division of labor in the financial sector have a positive impact on economic growth, on the other hand, they lead to an increase in investment, which slows down the process of economic growth.

Basic Diamond models (Diamond 1984), L. Kaas, G. Weinrich (Kaas, Weinrich 2015) determine the dependence of economic growth on the endogenous behavior of the financial sector in the economy. In the work of Fu-Sheng (2017) using the non-linear model of endogenous growth with financing investments through the credit market, the ambiguity of the impact of changes in this situation is shown.

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In general, after analyzing a number of econometric models presented in the scientific literature, we can divide them into two types: Type 1 - models for assessing the impact of the financial system on economic growth through increased investment; Type 2 - models that study the impact of financial intermediaries on technical progress, the innovative activity of firms and the quality of investments.

At the same time, in the economic literature there are examples of models using both temporal and panel data series for different samples of countries, which confirm the presence of a statistically significant positive correlation between the level of development of the financial sector and its individual segments and economic growth rates, as well as a causal relationship between them (Schumpeter, 1982).

Most authors in studies conduct empirical verification of statistical data (on time or panel series) using the standard regression equation (1), when potentially significant variables are included in the set of regressors that reflect political, geographical, economic, social and other factors:

$$y_i = a_0 + \sum_e a_e x_{ei} + \sum_p b_p z_{pi} + \sum_r c_r D_{ri} + \varepsilon_i$$

where:

y_i – GDP growth rate in the i-th country;

a_0 – constant;

a_e – economic variable coefficient;

x_{ei} – economic variables (investment, capital, human capital, etc.);

b_p – coefficients for additional variables;

z_{pi} – additional variables (political, social, geographical, etc.);

c_r – coefficient at dummy variable;

D_{ri} – dummy (dummy) variable reflecting the group effect (for example, regional, etc.);

e_i – random component.

4. Qualitative and Quantitative Research

Unlike previous researchers, we set the task of combining the two types of models into one, because the interaction of financial-credit and real (including innovation) sectors is considered by us as a systemic dynamic process occurring within a larger mega-economic dynamic system, which requires Simultaneous use in the model of such significant factors of economic development as growth of investments, innovations and development of the institutional environment that affect the character, quality and The direction of the interaction process subjects said sectors (Kleiner, 1997).

The Paneldata source of data was the statistical database of the World Bank's macroeconomic indicators (The World Bank - www.data.worldbank.org) (2019), on the basis of which macroeconomic indicators were collected for 15 countries over the past 40 years. Countries were grouped into 3 groups:

• 1 group - developed countries (United Kingdom, Denmark, Germany, Netherlands, Norway, Singapore, USA, Finland, Switzerland, Sweden). The choice of countries united in the first group was due to the high position of each of them in the ranking of the Global Innovation Index (https://www.globalinnovationindex.org/Home), published annually by the international business school INSEAD (2019).

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• 2 group - developing countries of BRICS. Taking into account that the positions of the countries of the first group on a number of macroeconomic indicators are quite high compared to Russia and Kazakhstan, data on Brazil, India and China, with the exception of the Republic of South Africa, were entered into the model due to the lack of certain statistical indicators in the World Bank database.
• 3 group - Russia and Kazakhstan. The Russian Federation is assigned to the 3rd group of countries along with the Republic of Kazakhstan due to the similarity of trends.
Work with panel data was carried out in the statistical package Stata 12.
The proposed model was based on a wide range of indicators of a temporary and spatial nature, given that the process of interaction between sectors is influenced by a set of interrelated micro, meso and macroeconomic factors, and the subjects are distinguished from each other by the specifics of their activities and institutional environment (Ahmed, Ansari 2018).

One of four main methods was chosen as a measure of institutional characteristics - based on macroeconomic indicators - characterizing the degree of maturity of the relationship between the studied sectors (the amount of bank loans extended to the private sector (in% of GDP), the GDP deflator (index), the amount of investment (in% to GDP), the level of refinancing rate (in%), tax rates (in%), reserve requirements (in% of total assets), etc (Chatelain, Amable 2001).

The logic of structuring the groups of dependencies of macroeconomic parameters in the proposed model is based on the key factors of economic development that are directly related to the process of interaction between the financial and credit and real (including innovation) sectors.

The following variables were chosen as dependent (explained) and independent (explaining) variables:
1) GDPgrowthit (vector of GDP growth rate values,% (GDPgrowth (annual%)) is a macroeconomic indicator reflecting the dynamics of the value of all goods and services produced, characterizing the rate of economic growth in group i at time t and considered as the following function (2) :

$$GDP\ growth_{it} = f(GDP\ deflator_{it}; inv_{it}; tech\exp_{it}) \quad (2)$$

2) $Credit_{it}$ (vector of values of domestic bank credit to the private sector, in% of GDP (Domestic credit to private sector by banks (% of GDP)) - a macroeconomic indicator of the role of banks in the development of the economy in the group i at time t, determined in accordance with the formula (3):

$$credit_{it} = f(\inf_{it}; dep\ \mathrm{int}_{it}; lend\ \mathrm{int}_{it}; refin_{it}; npls_{it}; riskprem_{it}; bankres_{it}; bankcap_{it}; taxrate_{it}) \quad (3)$$

At the stage of preliminary data analysis, checking the series for stationarity and cointegration showed that the data are strictly non-stationary and cointegrated, which required the use of the panel cointegration method.

But on the macrodata, this method often gave an error, which led to the choice of two classical models of panel data at once, in order to check the stability of the obtained results:
• the combined regression model or the generalized least squares method ("PoledledS" model) - does not take into account the panel data structure and the differences between the temporal and individual

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effects of the objects under consideration. It assumes that all errors ε_{it} uncorrelated with all explanatory variables x_{it}.

Ordinary OLS – assessments β are well-off and efficient:

$$y_{it} = x'_{it}\,\beta + \varepsilon_{it} \qquad (4)$$

• model with a fixed effect (FE – fixed effect model) - allows to take into account the immeasurable individual differences of objects (effects) (7):

$$y_{it} = a_i + x'_{it}\,b + e_{it}\,, \qquad (5)$$

where α_i expresses the individual effect of object i (in this case, groups of countries), independent of time t (in this case from 1985 to 2014), with regressors x_{it} do not contain a constant.

5. Results

The results of the assessment of the dependence of GDP growth rates and the growth of innovations and investments, presented in Table 1, showed that in the first group of developed countries, the most significant positive factor of economic growth (at a significance level of 99.9%) are innovations (0.105 by PooledOLS and 0.131 by FE). The model results showed that investments, despite the rather high level of significance of the coefficient obtained (99%), in the group of developed countries occupy only the second place in the structure of factors of economic growth (0.135 Pooled OLS).

In the second group of developing countries, BRICS showed the greatest positive impact on economic growth with a level of confidence of the obtained coefficients at the level of 99%; (0.147 by FE). At the same time, the share of R-squared dispersion explained by the PooledOLS model was 63%. As can be seen from formulas (10) and (11), just as in the first group of developed countries, the crisis of 2008 exerted a decline in economic growth in Brazil, India and China. (-4.048 by Pooled OLS and FE).

We believe that the obtained result confirms the thesis that economic development in Russia and Kazakhstan is due to the historically established raw structure of the economy, and economic growth in modern conditions is still achieved due to income from the export of raw materials and investment growth in traditionally developed extractive industries. At the same time, the share of the R-squared dispersion explained by the FE model is rather high and amounts to 56%.

The dynamics of the dependence of GDP growth and exports of high-tech goods by groups of countries is presented in Figure 1.

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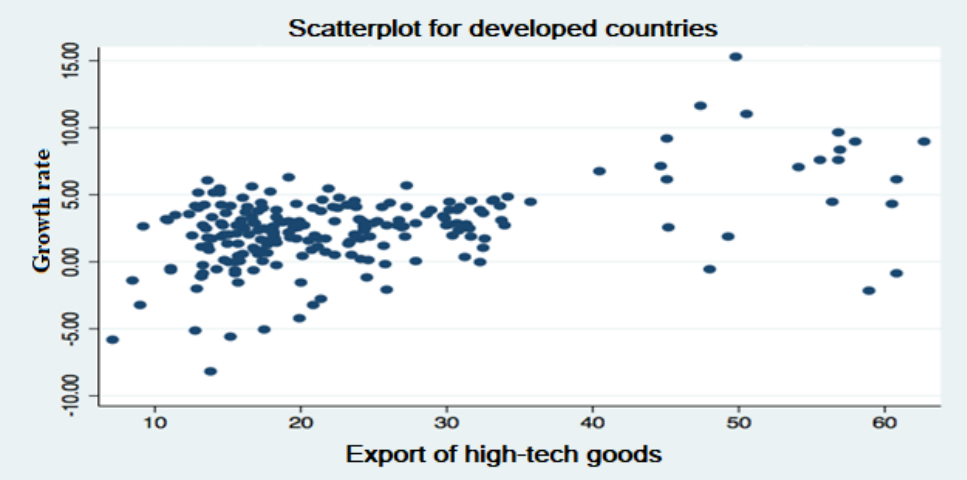
Table 1. Results of testing the dependence of the GDP growth rate on the GDP deflator, investments and innovations

Variables	1st group of countries (developed countries)		2nd group of countries (BRICS countries)		3d group of countries (Russia and Kazakhstan)	
	Pooled OLS	FE	Pooled OLS	FE	Pooled OLS	FE
	GDP growth		GDP growth		GDP growth	
GDP deflator	-0,044***	-0,044**	0,001	0,018***	-0,001	-0,002
Investments	0,135**	0,117	0,345***	0,361***	0,451***	0,469**
Innovations (techexp)	0,105***	0,131***	-0,072	0,147**	-0,001	-0,049
Constant	0,530	0,339	-3,015***	-4,091*	-5,789	-7,257**
Observations	220	220	69	69	37	37
R-squared	-	-	0,627	0,305	0,208	0,563
Number of id	-	-	-	3	-	2
tstatistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001 (1st group of countries)						
Standard errors in parentheses * p < 0.01, ** p < 0.05, *** p < 0.1 (2nd and 3d groups of countries)						

Source: compiled and calculated by authors



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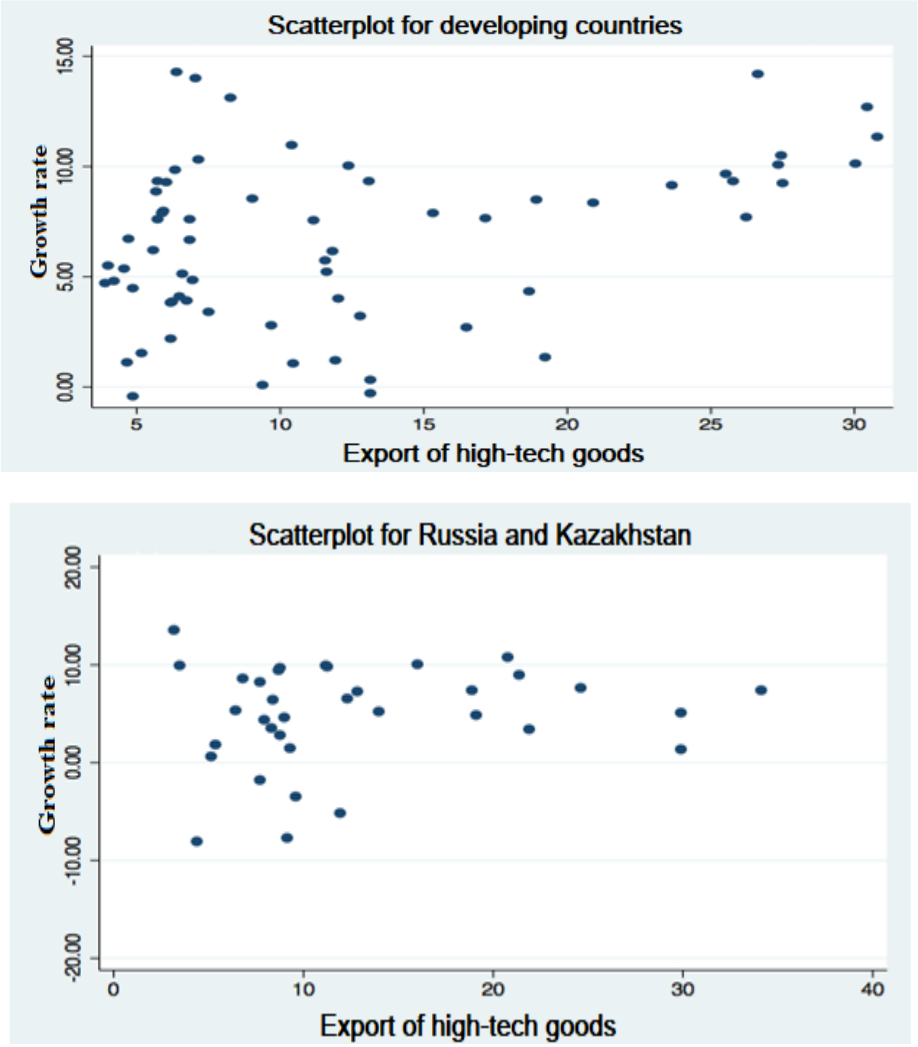

Figure 1. The scatter diagram of data showing the dependence of GDP growth and exports of high-tech goods
Source: compiled by authors

Within the framework of the second level of dependence, the task was set to determine the impact of variables reflecting the existing institutional environment on the domestic bank credit as one of the most common instruments of influence of financial and credit institutions on innovation activity in the real sector. In other words, within the framework of one model, along with an assessment of the impact of innovations and investments on economic growth (realization of external effects), the task was to determine the impact of regulatory institutions, the distribution of risks and resources on the interaction of financial and credit and real (including innovation) sectors of the economy (realization of internal effects) (Levine, 2015, 2016).

The results presented in Table 2 showed the difference in the influence of central bank regulatory instruments (in particular, monetary policy) on the growth of bank lending as the predominant form of interaction between the financial and credit and real (including innovation) sectors. So, while in the group of developed countries (0.355 for PooledOLS and 0.632 for FE) and BRICS countries (3.041 for PooledOLS), a significant dependence of domestic bank credit on the refinancing rate was noted, in Russia and Kazakhstan this trend was not revealed.

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It is also necessary to point out the negative impact on credit growth in Russia and Kazakhstan of the risk premium (-0.214 by POLS), which is higher than in foreign countries, as well as tax rates in the group of developed countries (-5.276 by FE) and in Russia and Kazakhstan (-0.573 by pols). For example, this is illustrated by the example of the countries of the first group of developed countries in Figure 2 and 3. In these countries, in the aftermath of the global financial crisis, tax rates were significantly increased compared to countries such as Russia and Kazakhstan, which remained lower tax rates.

The lack of correlation between the refinancing rate and the dynamics of bank lending suggests that this instrument of state regulation of the financial market does not work and is not a valid indicator of changes in market interest rates set by commercial banks. Not the effectiveness of such an important instrument of regulation by the financial regulator generates a chain interrelated problems and related consequences that limit the interaction of financial and credit Nogo, and real (including innovation) sectors. These include: increased cost and inaccessibility of credit resources adequate in terms of time and cost, sectoral and regional imbalances, poor state and low competitiveness of industries and enterprises of the non-commodity sector, low transparency of sector entities against the backdrop of a complicated reporting system and stricter government regulation, the corruption component in both sectors and many others.

In other words, against the background of the institutional conditionality of the process of interaction between the financial and credit and real (including innovative) sectors of the economy, the effect of the “regulation - risks - resources” problem hub is aggravated. The presence of some problematic ligament due to a causal relationship of the three node components or the system "3 R":

• the regulatory component (regulation) incorporates such problems as: sectoral and regional imbalances, the state and competitiveness of industries and enterprises of the non-commodity sector, low transparency of the subjects of the financial and real sectors against the background of a complicated reporting system and stricter financial regulation, a corruption component in both sectors other (North, 2017).

• the risk component (risks) combines such problems as the opposition of interests of subjects of financial and real sectors, information asymmetry, growth of speculative transactions, deterioration in the quality of financial assets, tightening of regulatory and banking policies, unavailability of services, state and potential of sectors, changes in market conditions and others (Coase, 2013).

• the resource component (resources) finds its manifestation in an insufficient level of public confidence in the financial and credit system, the growth of fund-raising funds, a shortage of long-term liquidity at the micro, meso and macro levels of interaction between sectoral actors, capital outflows outside the country, and the absence of effective mechanisms for investing funds from funds long-term accumulation, underdevelopment of refinancing tools, weak stock market, financial literacy of subjects and many others (Akerlof 1970).

Table 2. Results of testing the dependence of domestic bank loans on various institutional conditions

Variables	1st group of countries (developed countries)		2nd group of countries (BRICS countries)		3d group of countries (Russia and Kazakhstan)	
	Pooled OLS	FE	Pooled OLS	FE	Pooled OLS	FE
	Domestic Bank Credit to the Private Sector (credit)		Domestic Bank Credit to the Private Sector (credit)		Domestic Bank Credit to the Private Sector (credit)	
% loan rate (lendint)	-6,938	-	0,496	-	0,631	-

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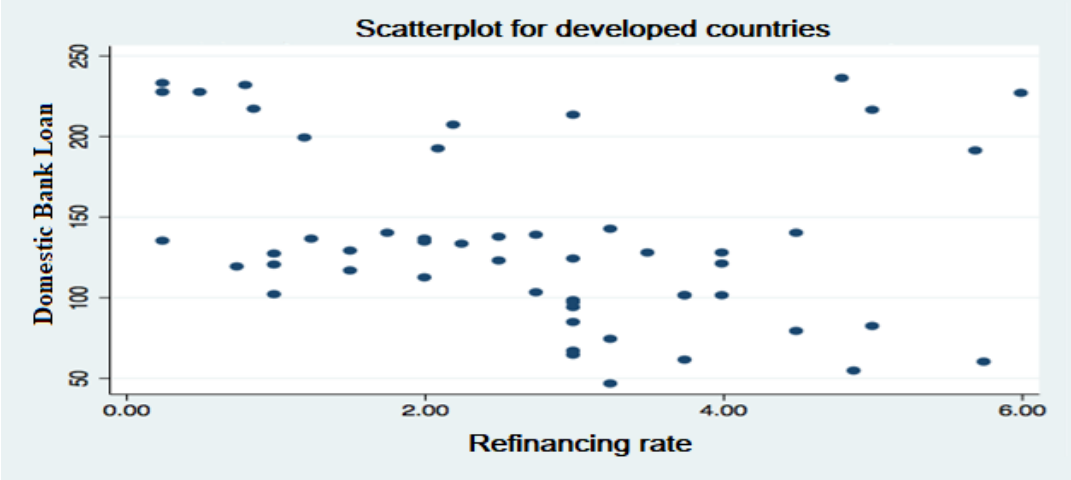
total tax rate (tax rate)	0,903	-5,276***	1,544	-	-0,573***	-
% deposit rate (depint)	-	4,047**	-	-	-	-
credit risk premium (risk prem)	-	-	3,614	-	- 0,214*	-
% refinancing rate (refinan)	0,355**	0,632**	3,041	-	0,631	-
bank reserves to assets (bankres)	0,019*	0,226**	2,816	-	-0,421***	-
Constant	145,2***	131,0***	-3,061	-	-	-
Observations	51	141	12	-	9	-
R-squared	-	-	1,000	-	0,435	-
Number of id	-	-		-		-
*t*statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (1 группа стран)						
Standard errors in parentheses * p < 0.01, ** p < 0.05, *** p < 0.1 (2 и 3 группыстран)						

Source: compiled and calculated by authors



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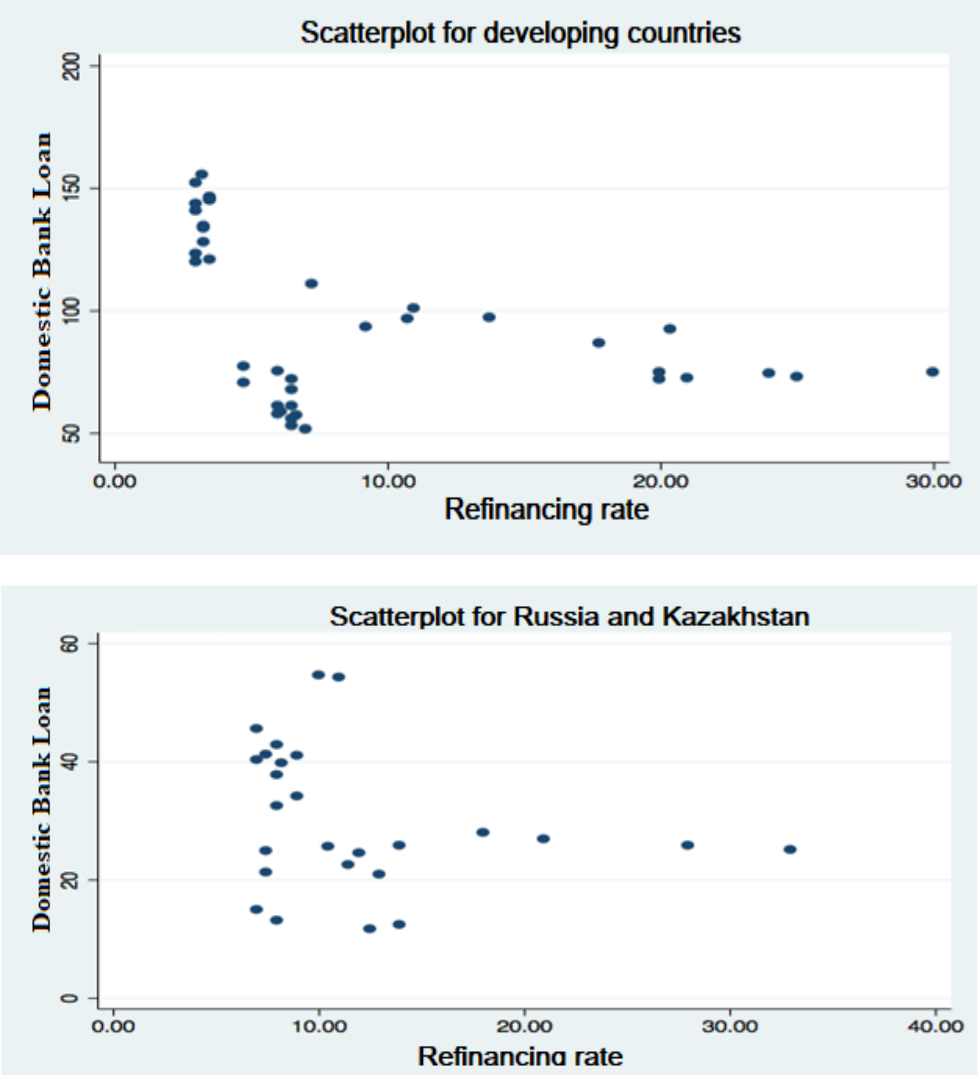
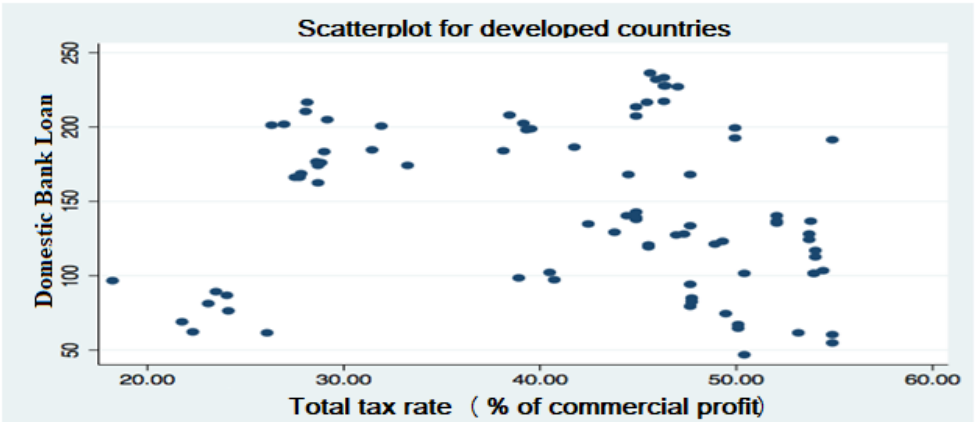


Figure 2. The scatter diagram of data showing the dependence of bank lending on the refinancing rate of the Central Bank
Source: compiled by authors



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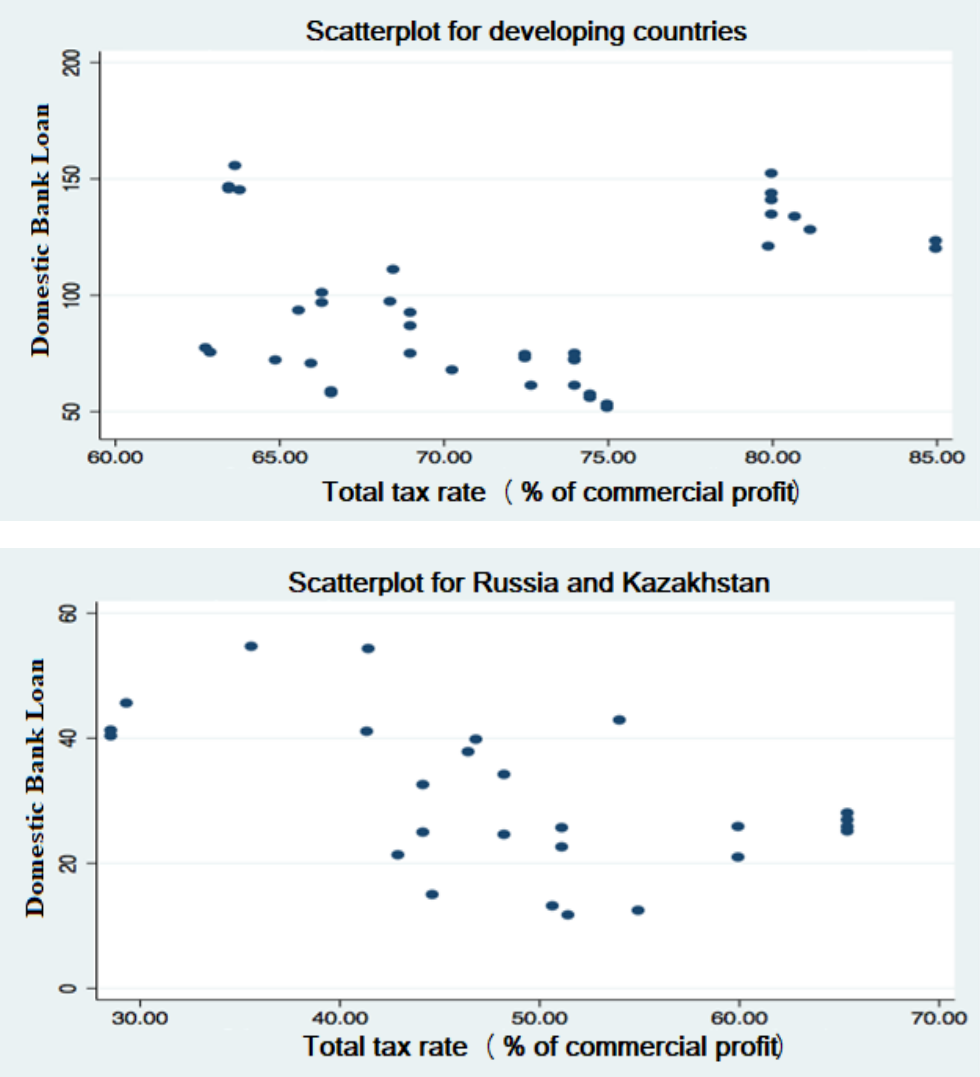

Figure 3. The scatter diagram of data showing the dependence of bank lending on the level of taxation
Source: compiled by authors

5. Discussions

The obtained results allowed to draw a number of conclusions:
- Innovation has a strong influence on the dynamics of GDP growth in developed countries and, to a lesser extent, in countries with rapidly emerging markets, compared with Russia and Kazakhstan, where investments from the oil and gas sector continue to be the main driver of economic growth (Kalkabayeva et al. 2017);
- for Kazakhstan, the strong impact of bank loans on innovations in the real sector was revealed, which predetermines their prospects in the short and medium term against the background of a shortage of domestic and limited budget sources for financing investments;
- found that in Kazakhstan, compared to developed countries and BRICS countries, there is no strong dependence of investments on inflation, which should be the basis for eliminating distortions in the conduct of restriction policies of the central bank, aggravating and preserving problem nodes in the area of interaction between the banking and real sectors of the economy (Blauberg 1969);

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- based on the assessment of the impact of the innovation activity indicator (negative impact of R & D costs) and use in modeling time lags, it was determined that in the short and medium term for Kazakhstan, the impact of short and medium-term bank loans is most significant for the purchase of ready-made innovations in the context of catch-up development (Veblen, 2014);
- groups of dependencies in the model provided a result confirming the asymmetry of state regulation measures, when with a significant impact of public resources on investment compared to bank loans, this effect on innovation does not occur, despite the fact that the policy of industrial-innovative development is being implemented (Rozmainsky, 2018);
- it proved that there is no relationship between the level of the refinancing rate and the domestic bank loan in Kazakhstan, therefore, the manipulation of the discount rate by the central bank cannot affect the availability and expansion of bank lending, as the most topical form of interaction between the banking and real sectors of the economy, including due to the endogeneity of banks' behavioral strategies;
- revealed the negative impact of specific pricing on bank resources, including through the current practice of taxation and a relatively high risk premium on the expansion of bank lending, as a simultaneous manifestation of the actions of the problem nodes we identified: “risks”, “resources”, “regulation”.

Conclusions

Pronounced globalization processes and trends in financial and economic turbulence today have exacerbated issues related to ensuring the sustainable development of national economic systems, including through the harmonious intersectoral interaction of various economic actors. In this study, an attempt was made to simulate country panel data to prove the significant impact of the regulatory system on the intensity and quality of interaction between the two strategic sectors for any economy - financial and credit and real (including innovation) sectors of the economy against the background of a strong correlation between economic growth rates and innovation component.

At the same time, the ability of the process of interaction of financial-credit and real (including innovative) sectors of the economy to simultaneously generate effects (as expected results at different levels) as the resulting system element led to an inter-country comparative analysis of indicators of the role of interaction between economic sectors in order to determine their current and perspective positioning. The results of the analysis showed that Kazakhstan’s lag behind a number of developed countries is caused by various institutional conditions affecting the potential and capabilities of the interacting sectors.

References

Ahmed, S.M; Ansari, M.I. 2018. Financial Sector Development and Economic Growth: the South-Asian Experience. Journal of Asian Economics, 3(9), 503 - 517. https://doi.org/10.1016/S1049-0078(99)80100-6

Akerlof, G. 1970. The Market for Lemons: Quality Uncertainty and the Market Mechanism. Quarterly Journal of Economics, 8(11): 488-500. https://doi.org/10.2307/1879431

Chatelain, J.B., Amable, B. 2001. Can financial infrastructures foster economic development?. Journal of Development Economics, Elsevier, 64(2), 481-498. https://doi.org/10.1016/S0304-3878(00)00147-4ff.ffhalshs-00112551f

Bekaert, G. & Lundblad Ch. 2015. Does Financial Liberalization Spur Growth? Journal of Financial Economics, 1(77): 3 –55.

Blauberg, I.V. 1969. Systematic approach: prerequisites, problems and difficulties. 48p.

Coase, R. 2013. Firm, market, law. Moscow. Catalaxy. 395.

Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan. 2019. http://www.stat.gov.kz

Deidda, L., Fatia, B. 2015. Non-linearity between Finance and Growth. Economics Letters, 3(74): 339 –345.

Diamond, D. 1984. Financial Intermediation and Delegated Monitoring. Review of Economic Sturdies, 3 (51): 393–414.

Fu-Sheng, H. 2017. Credit Market Development and Economic Growth. Journal of Economics and Business, 2(54): 219–237.

Global Innovation Index https://www.globalinnovationindex.org/Home

Kaas, L., Weinrich, G. 2015. Money and Growth in a Production Economy with Multiple Assets. Macroeconomic Dynamics, 1 (7): 670 – 690.

Kalkabayeva, G.M., Kurmanalina A.K. & Gusmanova, Zh.A. 2017. Current State and Forecasting of the Development of Bank Crediting in Kazakhstan. Journal of Advanced Research in Law and Economics, 4 (26): 1161-1166. https://doi.org/10.14505/jarle.v8.4(26).13

Kleiner, G. B. 1997. An enterprise in an unstable economic environment: risks, strategies, security. Moscow. 288.

Levine, R. 2015. Financial Intermediation and Growth: Causality and Causes. Journal of Monetary Economics, 1 (46): 31 –77.

Levine, R. 2016. Bank-Based or Market-Based Financial Systems: Which Is Better? Journal of Financial Intermediation, 4(11): 398 – 428.

National Bank of the Republic of Kazakhstan. http://www.nationalbank.kz

North, D. 2017. Institutions, institutional changes and the functioning of the economy. Moscow. 190.

Rioja, F., Valev, N. 2014. Does One Size Fit All: a Reexamination of the finance and growth relationship. Journal of Development Economics, 2(74): 429–447.

Rozmainsky, I.V. 2018. The history of economic analysis in the West. Library: Second-hand bookshelf's shelf. http://www.society.polbu.ru/rozmainsky_econanalysis/ch69_i.html

Schumpeter, J. 1982. Theory of Economic Development. Moscow. Progress. 455.

Uakhitzhanova, A., Shokhan, R. & Omarova A. et al. 2017. Entrepreneurial Environment in the Current Financial Politics of Kazakhstan. Journal of advanced research in law and economics, 4(26): 1371 – 1374. https://doi.org/10.14505/jarle.v8.4(26).37

Veblen, T. 2014. Theory of the idle class. Moscow. Progress. 368 p.

World Bank http://www.worldbank.org

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PART-TIME AND TEMPORARY EMPLOYMENT IN MODERN CONDITIONS: SCOPE AND PRIORITIES OF SOCIAL PROTECTION*

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Abstract. The article considers the factors acting in the post-industrial economy both on the demand side for labor and on the supply side, which determined a sufficient number of options for deviation from the standard schedule, the most widespread of which include temporary employment, part-time employment and self-employment. If the first two types are options for non-standard employment for employees, the latter is allocated to a special employment status, which differs from the status of "employee" on a number of clear criteria. It is concluded that the burden on part-time workers has decreased, which is one of the signs of an impending crisis, when they reduce the number and length of working time for part-time workers, refusing their services in the first place. At the same time, the growth of over-employment again speaks of the desire of people to save their jobs through overtime work. According to the results of our study, we have developed proposals for enhancing the social protection of temporary and part-time workers.

Keywords: social protection; employment; non-standard employment; economy

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JEL Classifications: J21, J28.

1. Introduction

In modern conditions of globalization, there is integration of countries, growth of interdependence and interrelation of both regional and national and global economies. World economic and financial crises, country

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risks as well as a number of internal and external risks caused the need to review the process of public administration in the economic, environmental and social spheres.

Modern society, interacting with nature and using it has faced a situation when the functioning of the industrial world gave birth to a number of problems that threaten the existence of humankind. There were contradictions between the interests and needs of the current generation and future generations as well as the actual and perspective interests of nature. There is an increase in destabilizing factors, an increase in the general instability of functioning. The result is aggravation of many socio-ecological and economic problems worsening of the quality of life of the population, deterioration of the state of the environment. All these contradictions can be resolved only from the standpoint of sustainable development. Socio-ecological and economic development of society, satisfaction of the needs of the population should be coordinated with the capabilities of the natural environment. At the same time, the active role had given to the state (Yemelina, Omarova 2018).

Since the early 1970s, the monitoring of the population's employment in the developed countries has registered the growth of flexible employment forms that have been actively introduced in enterprises and organizations in the form of a part-time work (shortened working day); the use of home-based work, job to call, special working hours and other forms (Gimpelson, Kapelyushnikov 2015).

In postindustrial economy of developed countries, three main forms of non-standard employment are firmly rooted, the scope of which varies in different periods of economic development. At the same time, the forms are characterized by stability, but the structure of employment types which are included in these forms varies somewhat, reflecting the features and fundamental properties of leading economic structure (Kalleberg 2017).

The factors operating in postindustrial economy, both for labor force demand and supply, determined a sufficient number of options for deviations from the standard schedule, the most widespread of which include temporary employment, part-time employment and self-employment (Carre et al. 2015). While the first two types are non-standard employments for employees, the latter is allocated to a special employment status that differs from the "hired employee" status by a number of exact criteria (Lazear 1990).

The purpose of our research is to assess the scope and dynamics of non-standard employment in Kazakhstan to develop recommendations for enhancing the social protection of these groups. The research methods were statistical methods of structural and dynamic analysis.

2. Research background

Various types of non-standard employment that provide opportunities for raising the income and living standards of population, had originated in the transformational period and are rather widely spread in the economy of post-Soviet countries and Kazakhstan (Smirnykh 2016).

The main types of non-standard employment in the modern economy are temporary, part-time and over-employment of population (Hausman, Rodrik 2015).
As we mentioned in the first chapter of research, temporary employment or fixed-term contracts are widely distributed in global economy. Such contracts allow the employer to:

– hire an employee on probation and assess his capabilities (Vishnevskaya 2015);
– take into account the requirements of market conditions due to changing situation in the marketplace and reduce the wage expenditures;
– hire an employee for a certain scope of work;
– hire an employee for the required period in the season;

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– hire an employee to execute one-time instruction (Blanchflower 2016).

If you look at the trends in 2013–2017 (data is not comparable with earlier years due to changes in the calculation methodology), the agreement permanence generally grows which indicates a stable economic development.

In 2013, permanent employment contracts dominated in all sectors: agriculture – 85.4%; construction – 89.9%; service sector – 96.2%; industry – 98.2% (Table 1).

Table 1. Sectoral structure of employment agreements by types in 2017/2013, in %

Economy sectors	Permanent employment agreement	Fixed-term employment agreement	Certain scope of work	Casual work	Seasonal work
	2017/2013				
Total	96.5/94.8	2.0/3.1	1.2/1.6	0.1/0.3	0.2/0.3
Agriculture	86.5/85.4	6.8/7.6	5.4/5.4	0.3/0.2	1.1/1.3
Industry total	98.7/98.2	0.9/1.2	0.3/0.4	0.0/0.3	0.0/0.0
Construction	91.2/89.9	3.3/5.4	3.9/3.1	0.2/0.5	1.5/1.1
Services total	97.6/96.2	1.6/2.4	0.7/0.9	0.1/0.3	0.1/0.1
Note – Prepared based on source [13]					

Source: compiled by authors according to official website of the Committee on Statistic, http://stat.gov.kz

The second in importance agreement in agriculture is for a certain scope of work – 5.4%; in industry – fixed-term agreements – 1.2%; in construction – fixed-term agreements and agreements for a certain scope of work – 5.4% and 3.1%, respectively; in service sector – fixed-term agreement – 2.4%. Actually, fixed-term agreement which was used most often in industry, construction, and services was the most in-demand in 2013. An agreement for a certain scope of work was the most in-demand agreement in agriculture.

In 2017, the share of employees employed under permanent employment agreements in aggregated sectors of economy increased everywhere. The above shares in the industry were as follows:

– agriculture – 86.5%;
– construction – 91.2%;
– service sector – 97.6%;
– industry – 98.7%.

In agriculture, the most significant group of non-standard agreements are agreements for a certain work scope – 5.4% and fixed-term employment agreements – 6.8%.

In service sector, the most significant share is fixed-term employment agreements – 1.6%.

In construction, agreements for certain work scope amount to 3.9%.

In industry, the share of non-standard agreements is extremely insignificant, in aggregate they constitute 1.2%. The sectoral structure of employment agreements is shown in Table 1.

As a whole, dynamics in economy allows to conclude that for the period concerned the economic growth was stable, as a result of which the share of employment agreements concluded on a permanent basis increased in the economy as a whole, and the shares of all agreements concluded in non-standard form decreased (Pritvorova et al. 2016).

If we look at separate sectors, it is obvious that the four aggregated sectors concerned can be divided into two groups characterized by multidirectional trends.

In industry and service sector, the share of all types of non-standard agreements reduced, except for the share of agreements "for a certain work scope" in the service sector.

In agriculture and construction, the trend is not so definite:

1) In agriculture, the shares of all types of non-standard employment agreements are the most significant in the country's economy as a whole, while the share of casual work increased to 0.3%.
2) In construction, agreements for a certain work scope are more demanded among all types of non-

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standard agreements – 3.9% (the share increased compared to 2013 from 3.1%) and seasonal work – 1.5% (the share increased by 0.4%).
If you look through a prism of the employment agreement type, then among the variety of non-standard employment agreements there is a type of "fixed-term employment agreement", the share of which is maximum on average in the economy (Govorova 2015).

In the service sector there are also its certain types which for the period from 2013 to 2017 are characterized by a growth in the absolute number of non-standard agreements:
– The share of "fixed-term" agreements increased in such activities as transport and warehousing, information and communication, financial activities, real estate operations, administrative and support services, public administration, education, public health care.
– The share of agreements "for a certain work scope" increased in such activities as information and communication, financial activities, real estate operations, public administration, education, public health care, art, and other services.
– The share of "casual work" agreements increased in the administrative services and services of art, recreation and entertainment.
– The share of "seasonal work" agreements increased in public health care and services of art, recreation and entertainment (Grishin 2012).
Such data suggests that the service sector, with its nature and flexible work schedules, is generally more flexible and it is effective in applying various types of agreements based on the specifics of different activity types.

3. Application functionality

Employment indicators characterize on the one hand the General economic context of the country's development, on the other hand, the activities of the state employment service to assist citizens in employment, retraining, advanced training, etc (Zijl et al. 2014).

In general, in Kazakhstan economy, the sectoral structure of each type of temporary agreement in 2013 and 2017 is shown in Figures 1 and 2.

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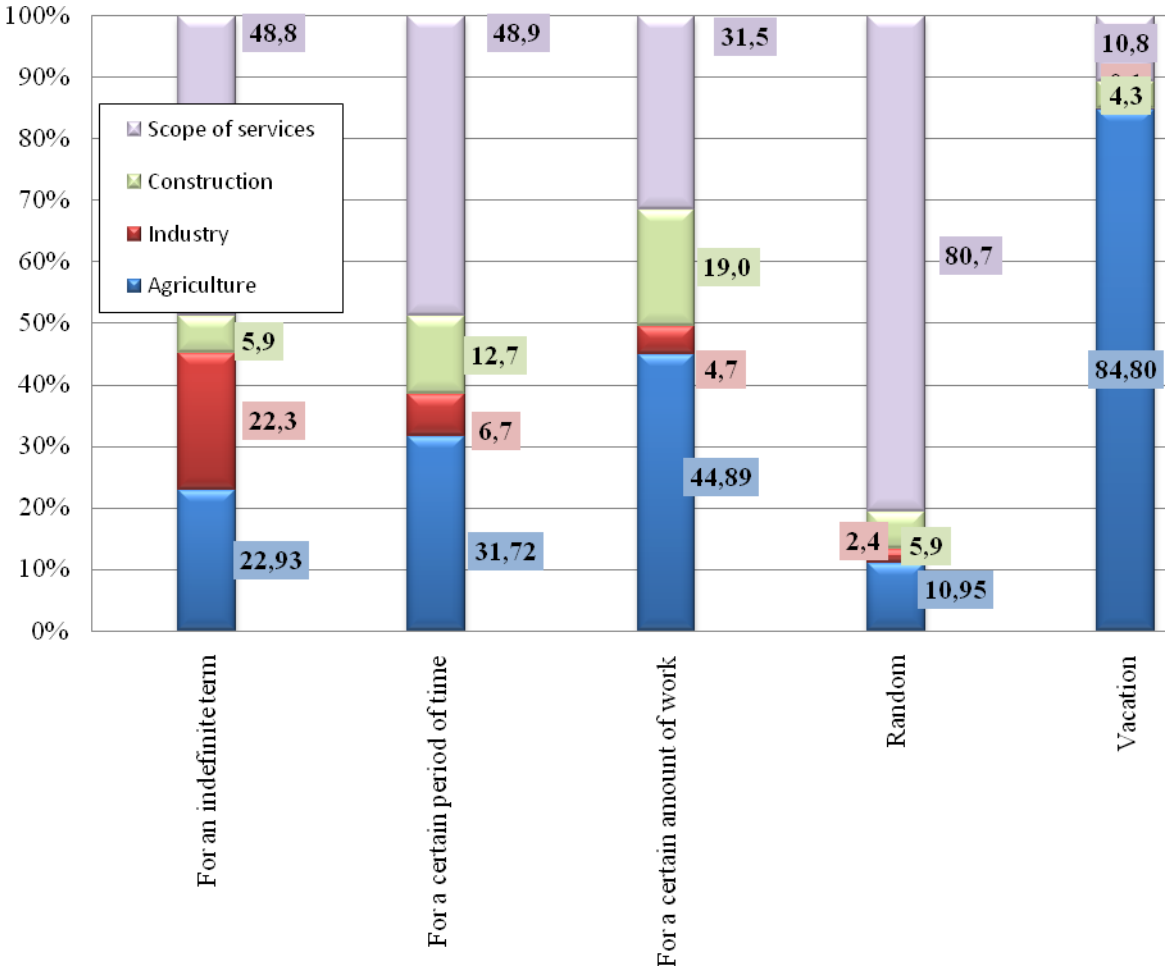

Figure 1. Sectoral structure for each type of employment agreement in 2013, in %
Source: compiled by authors according to official website of the Committee on Statistic, http://stat.gov.kz

In 2013, 48.8% of permanent employment agreements in Kazakhstan economy is in the service sector, and almost the same share of agreements with a limited term – 48.9%. The service sector is leading in these two types of agreements.

Agriculture holds leadership in agreements for a certain work scope (44.89%) and seasonal work (84.8%), which is typical for this sector.

Construction holds 19% in certain work scope contracts and 12.7% in fixed-term contracts.
In 2017, the share of service sector increased in indefinite-term agreements, fixed-term agreements and agreements for a certain work scope, while it decreased in casual agreements. Since the latter type of agreements is the most unstable and socially unprotected, we can say that the agreement stability in the service sector has grown.

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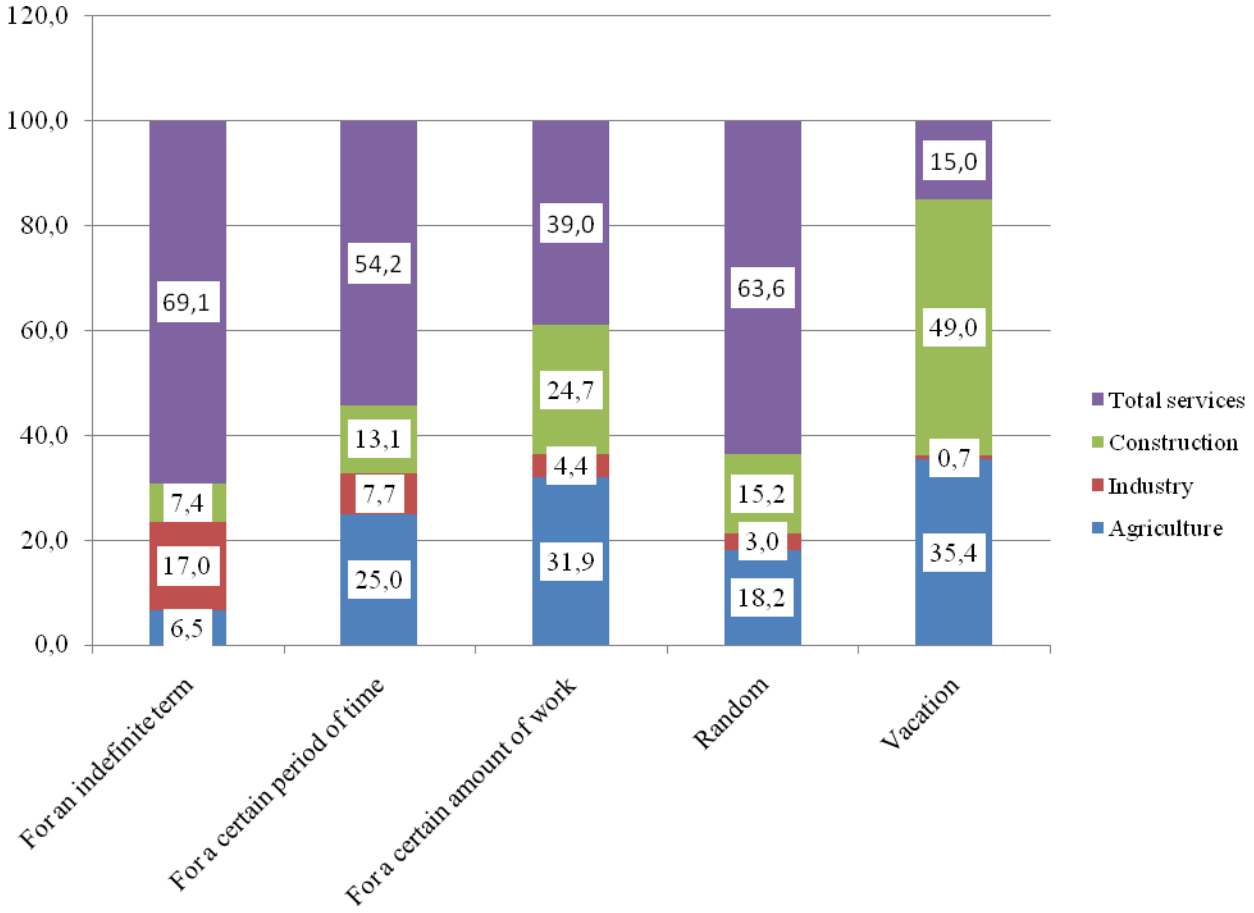

Figure 2. Sectoral structure for each type of employment agreement in 2017, in %
Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz

In contracts for a certain work scope, and especially in seasonal and casual contracts, the share of construction increased significantly.

In general, it can be concluded that the most significant change for 3 years in the employment agreement structure for major economic sectors is the increase in the construction share in agreements for fixed term, certain work scope, casual or seasonal work.

The next most common type of non-standard employment is employment with a deviation from standard working day duration for the following variants:

– overemployment;
– part-time employment (part-time contract);
– under-employment (full-time contract, but actual employment has less duration) (Nurmagambetov 2018).

Overemployment – working more than the normal number of working hours established by the laws, i.e. more than 40 working hours per week.

As per the data of 2017, in the composition of the employed population, according to the actual duration of the working week, the largest share – 66.6% is held by the population working for 36-40 hours per week, 9% falls to the share of the population that works less than 36 hours and 24.4% – to the share of over-employed people working over 40 hours (Figure 3).

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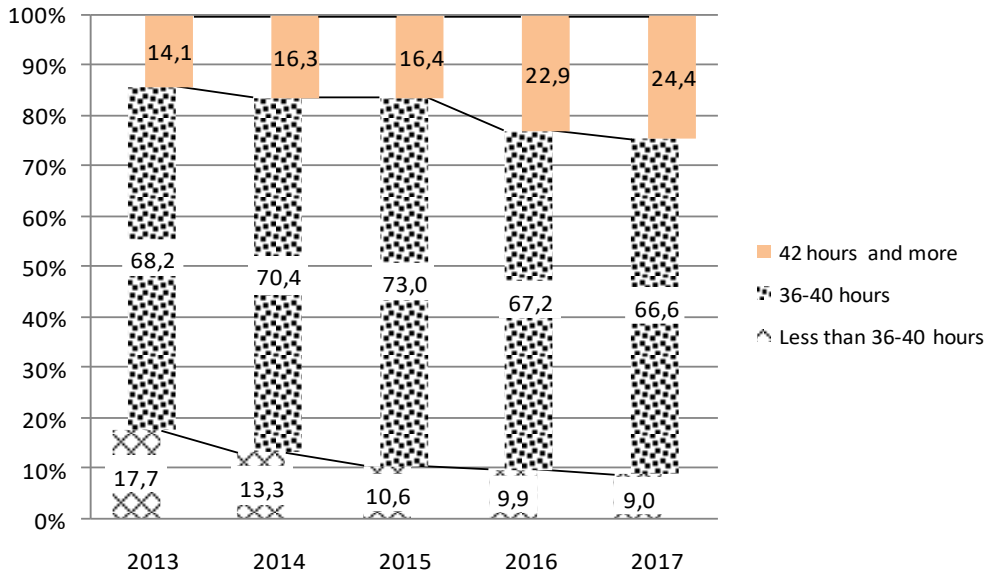

Figure 3. Structure of employed population by actual duration of working week, in %
Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz

It should be noted that for 2013-2015 the share of population that worked for a normal working week of 36-40 hours increased by 2015 inclusive, while the share of part-time employees who worked less than 36 hours decreased.

In 2017, a reverse was observed, when the share of over-employed people grew by 6.5% for one year, which corresponds to the pre-crisis situation and increased competition in the labor market, as well as to the desire of both business and workers to maintain the already achieved measure of income and well-being via excessive working hours.

At the same time, in the existing system of statistical observations it is impossible to separate part-time employment and under-employment, which are distinguished by a fundamental reason: voluntarily or involuntarily.

At the same time, some conclusions can be drawn based on the following data on employment with a shortened working day (Figure 4).

Along with the decrease in the number of people employed with a shortened working week, their distribution by groups with different working hours changed.

In 2013, the maximum number of employed people, 338.6 thousand, was in the group with a duration of 26-30 hours (0.75 of the rate), and the group with a duration of 21 to 35 hours (761.9 people in total) was half of all employees with shortened working week (1458.3 people).

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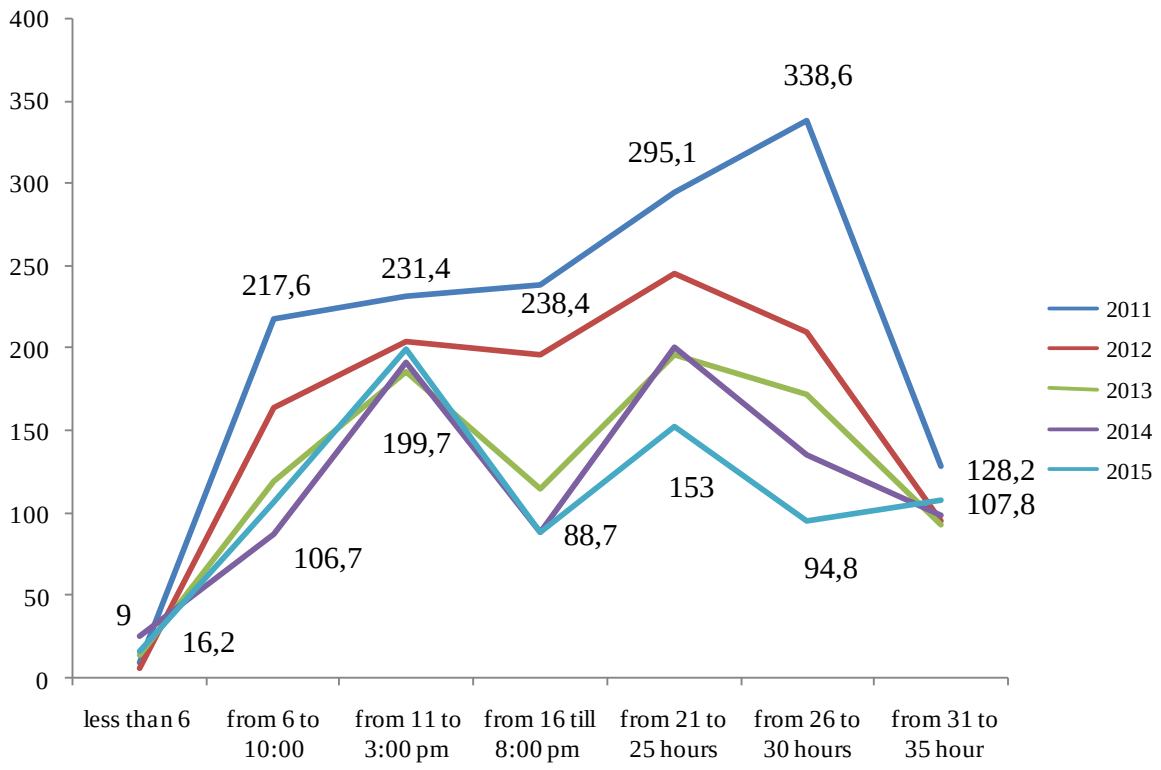

Figure 4. Employed population by actual working week duration, thousand people
Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz

Actually it may be said that a half was employed at 0.5 rate and more hours.

In 2017, the overall picture has changed: there are two peaks in the schedule: the maximum number of employees is at 0.5 rate and employees at 0.25 rate.

It can be concluded that the burden of part-time employees has decreased, which is one of the signs of a forthcoming crisis, when the number of part-time employees and their duration of working time are reduced and their services are primarily refused.

At the same time, the growth of over-employment indicates the desire of people to hold down their job via overtime work.

It should be noted that the share of employees with non-standard working day duration, including both part-time and over-employed workers, decreased during the period of 2013-2015, but in 2016 it increased to 32.3% and in 2017 it is 32.9% of all employed people (Table 2).

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Table 2. Indicators of part-time and over-employment in Kazakhstan economy, 2013-2017

Indicator	2013	2014	2015	2016	2017
Total employed, thousand people, including	8301.6	8,507.1	8,570.6	8,510.1	8,623.8
men	4,250.4	4,375.9	4,389.4	4,389.3	4,446.0
women	4,051.3	4,131.2	4,181.3	4,120.7	4,177.8
Structure of employed group by gender, %					
men	51.2	51.4	51.2	51.6	51.6
women	48.8	48.6	48.8	48.4	48.4
Structure of group with non-standard working day duration by gender, %					
men	50.9	53.1	52.3	54.7	54.8
women	49.1	46.9	47.8	45.3	45.2
Number of over-employed, thousand people (working day duration of 41 hours and more)					
men	701.1	828.1	811.3	1146.7	1,218.7
women	457.9	551.8	585.8	777.1	849.9
Share of over-employed people in the group, %					
men	16.5	18.9	18.5	26.1	27.4
women	11.3	13.4	14.0	18.9	20.3
Number of part-time employees, thousand people (working day duration of 41 hours and more)					
men	630.3	499.1	388.9	357.8	335.8
women	828.1	622.0	511.0	470.9	430.7
Share of part-time employees in the group,%					
men	14.8	11.4	8.9	8.2	7.6
women	20.4	15.1	12.2	11.4	10.3
Share of employees with non-standard working day duration (part-time and over-employment), %	31.5	29.4	26.8	32.3	32.9

Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz

If we consider the structure of over-employment and part-time employment by gender, then we can draw the following conclusions.

Men prevail in the group with non-standard working day duration: while the ratio of men and women in the employed population in 2017 is 51.6% and 48.4%, then in the group with non-standard duration, the ratio clearly changes in favor of men: 54.8% and 45.2%.

In general, the share of part-time employees in the men's group decreased structurally by 7.2%, and in the women's group by 10.1%. At the same time, part-time employment is more typical of women, in the group of which the share of those involved in this type of employment remains higher than in the men's group.

Over-employment increased in both groups, both in absolute terms and in structure: it increased from 16.5% to 27.4% for men, and from 11.3% to 20.3% for women. In fact, in the men's group, a little more than one quarter of

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workers are employed over normal working hours.

The following trends are observed in the structure of the over-employed population (Table 3).

Table 3. Characteristics of non-standard working day duration by status in the employment of Kazakhstan population in 2013–2017

Indicator	2013	2014	2015	2016	2017	Structural shift, 2017/2013 p.p.
Employees, including those with a workweek duration of						
36-40 hours	78.3	77.2	78.4	72.6	69.5	-8.8
41 hours or more	16.1	19.0	18.7	24.6	25.9	9.8
Less than 36 hours	5.6	3.8	2.9	2.8	4.6	-1
Self-employed people, with a workweek duration of						
36-40 hours	47.7	55.9	61.0	53.9	54.8	7.1
41 hours or more	9.9	10.6	11.2	18.6	18.7	8.8
Less than 36 hours	42.4	33.6	27.8	27.5	26.5	-15.9

Source: compiled by authors according to official website of the Committee on Statistic, http://stat.gov.kz

Increase in the share of over-employed workers as a whole over the period and decrease in the part-time employment is common for hired employees and self-employed workers. For self-employed people, a defined trend of increasing the share of the group with normal working time in the period from 2013 to 2015 was manifested, it has changed to a decline in 2016, but in general for the period up to 2017 the structural shift remains positive.

For hired employees, there was a trend to weaken the positions of the normal working day and a negative structural shift was recorded – 8.8 percentage points.

If we consider the structure of population employed simultaneously by types of contracts (permanent/temporary hired employment) and working time (standard/non-standard), we can reveal the following processes (Figure 5).
As per these two cuts and the five-year-dynamics nature, the following conclusions can be drawn:
– standard working time dominates in permanent agreements (70% or more) and certain work scope agreements (60-65%);
– over-employment is the most significant for contractors with a fixed-term agreement (70% or more);
– in general, an increase in over-employment during the period and especially in 2017 is typical for all types of contracts. Over-employment in 2017 reaches 30% or more in all types of contracts.

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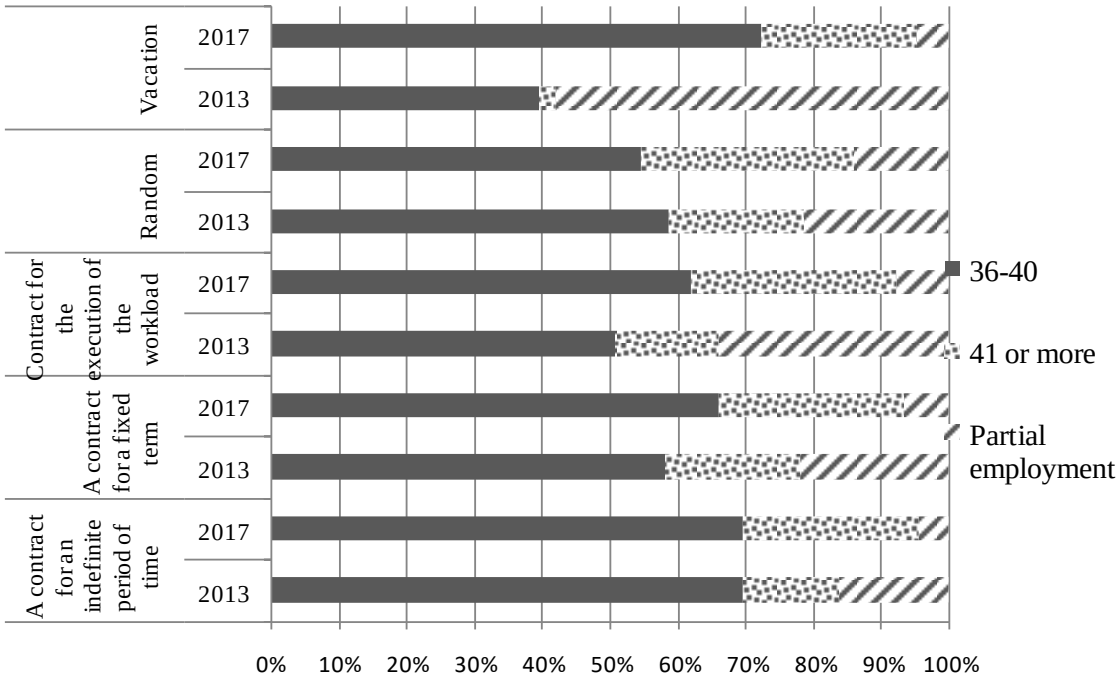

Figure 5. Workweek duration distribution by different contract types in 2013 and 2017, in %
Source: compiled by authors according to official website of the Committee on Statistic, http://stat.gov.kz

It can be noted in more detail that:

– In fixed-term agreements (permanent employment), the share of employees with standard working hours increased by 2% and the share of over-employed workers whose work day duration was 41 hours or more increased by 10%. As a result, on average for a period, the number of hours worked increased from 37 to 41 hours per 1 employed person.

– In temporary agreements where the share of over-employed people previously was also the largest of all types – 70%, there was the most significant increase in over-employment by 20%, and all other options for working time decreased. On average for a period, the number of hours worked increased from 38 to 42 hours per 1 employed person.

– In certain work scope agreements, over-employment increased by 20%, while the average working day duration for the group increased from 37 to 41 hours.

– In casual and seasonal employment, the share of contracts with standard working day duration and over-employment increased. The average working day duration for a group of casual employees increased from 40 to 43 hours. At the same time it increased from 29 to 42 hours in seasonal employment.

4. Results

Thus, the research of such types of non-standard employment in Kazakhstan as over-employment, part-time employment and temporary contracts allows to draw the following conclusions.

In recent years, temporary employment contracts are spreading in global economy, because employers use their opportunities for flexible HR management, personnel selection, reduction of labor costs during a crisis. Kazakhstan economy in the period under review does not demonstrate crisis trends, and the share of permanent

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employment agreements has grown to 90% or more in all major industries, except agriculture.

The most popular temporary agreement is the "fixed-term employment agreement" type, whose share in the national economy is higher than all other options of a temporary agreement. If you look at the dynamics in individual sectors, then agriculture has the most significant share of all types of temporary employment agreements, while the share of fixed-term agreements increased and is now 6.8%. In construction, temporary agreements are in demand and the most common forms are "certain work scope" – 3.9% and "seasonal work" – 1.5%.
In the service sector, the most flexible are the following sectors: information and communications, financial activities, real estate operations. In the public administration sectors, public health care, the share of "fixed-term" and "certain work" agreements slightly increased. The share of seasonal work agreements also increased in public health care. The share of casual and seasonal work contracts increased in arts, recreation and entertainment services.
The most significant change in the sectoral structure for each type of temporary employment agreements for the period from 2015 to 2017 is the growth in the share of construction in all types of temporary contracts: fixed-term, certain work scope, casual and seasonal work.

Non-standard working day duration is present in three options: over-employment, part-time employment (part-time contract), under-employment (full-time contract, but actual employment has less duration).

It should be noted that for 2013-2016 the share of the population that worked for a normal workweek of 36-40 hours increased by 2015 inclusive, while the share of part-time employees decreased by almost two times over the period. Over-employment increased by 10.3% from 2013 to 2017.

In 2016, a reverse was observed, when the share of over-employed people grew by 6.5% for one year, which corresponds to the pre-crisis situation and increased competition in the labor market, as well as to the desire of both business and workers to maintain the already achieved measure of income and well-being via excessive working hours.
Along with the reduction in the number of people working for a part-time week, the modal load values have changed. While in 2013 the maximum number of employees worked at 0.75 rate, in the distribution of 2017, there are already two peaks – 0.25 rate and 0.5 rate. It is obvious that with the deterioration of the economic situation within the dominant practice, part-time employees are primarily dismissed or reduced in working time.

In general, the share of employees with non-standard working day duration, including both part-time and over-employed workers, decreased during the period of 2013-2015, but in 2016 it increased to 32.3%; in 2017 it is 32.9% of all employed people.

The ratio of men and women in the employed population in 2017 was 51.6% and 48.4%. In the group with non-standard duration, the ratio clearly changes in favor of men: 54.8% and 45.2%, respectively.

Over-employment increased in both groups, both in absolute terms and in structure: it increased from 16.5% to 27.4% for men, and from 11.3% to 20.3% for women. In fact, in the men's group, a little more than one quarter of workers are employed over normal working hours.

Both over-employment and part-time employment is most often observed in the age group of 25-34. In general, the highest shares of over-employed people are typical for 25-54 years old, and over-employment sharply decreases beyond these limits.

Over-employment is more evident among hired employees: in 2015 – 25.9%, while among self-employed

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workers – 18.7%. High share of part-time employment is typical for self-employed people: 25.5% versus 4.6% for hired employees.

In the structure of population working 36 hours per week or more, by types of economic activity, the main share is held by the population engaged in wholesale and retail trade (14%), agriculture, forestry and fisheries (11%), industry (12%), education (10%).

Conclusions

If we consider the structure of the population employed simultaneously by types of contract (permanent/temporary hired employment) and working time (standard/non-standard), we can reveal the following processes:

– Standard working time dominates in permanent agreements (70% or more) and certain work scope agreements (60-65%);
– Over-employment is the most significant for contractors with a fixed-term agreement (70% or more);
– In general, increase in over-employment during the period and especially in 2017 is typical for all types of contracts. Over-employment in 2017 reaches 30% or more in all types of contracts.

As per the results of our research, we have developed proposals to enhance social protection of temporary and part-time employees.

An important protection mean for part-time employees may be measures that ensure a guaranteed minimum number of working hours and the establishment of a minimum amount of insurance payments for job losses. At present, these minimums are not specified in the Labor Code or other regulatory documents.

The minimum duration of workweek in countries worldwide ranges from 8 to 24 hours per week. In view of the experience of developed countries and the current domestic experience of part-time employment, it is proposed to establish the lower limit at the level of 10 hours in Kazakhstan. Currently, the amount of social benefit in case of work loss for a part-time employee is more than 2 times lower than the subsistence minimum of 10,519 tenge against 24,459 tenge (Nazarbayev 2012).

In order to prevent discrimination in social protection of part-time employees, it is proposed to accept social payments in case of a loss in the amount of the subsistence minimum.

In general, to ensure decent work for part-time employees it is proposed.

We propose two priorities in the social protection of such employees:

- Setting the minimum working time when concluding a part-time employment contract in the amount of 10 hours per week. (Now there is no such restriction in the Labor Code).
- Setting the minimum unemployment allowances for employees from compulsory social insurance system in the amount not less than the minimum wage for a minimum length of service of 6 months established by the RoK's laws for the current period.

References:

Blanchflower, D. 2016. Self-employment in OECD Countries. Labor Economics, 3(7): 471 – 505. http://www.nber.org/papers/w7486.pdf

Carré, F., Ferber, M. & Golden, L. 2015. Nonstandard Work: The Nature and Challenges of Changing Employment Arrangements. Urbana, IL: Industrial Relations Research Association. 89–115.

Gimpelson, V., Kapelyushnikov, R. 2015. Non-Standard Employment and the Russian Labor Market. Economic Matters, 1(7): 122–145.

Govorova, N. 2015. Employment in Postindustrial World. WE&IR, 4(12): 35–41.

Grishin, I. 2012. Stimulation and Dynamization of Employment: Flexity Recipe. WE&IR, 4(7): 40–51.

Hausman, R., Rodrik, D. 2015. Economic Development as Self-Discovery. Journal of Development Economics, 8(72): 603–633.

Kalleberg, A. 2017. Nonstandard Employment Relations: Part-time, Temporary and Contract Work. Annual Review of Sociology, 7(26): 341–365. https://doi.org/10.1146/annurev.soc.26.1.341

Lazear, E.P. 1990. Job Security Provision and Employment. The Quarterly Journal of Economics. 7(11): 699–726. http://hdl.handle.net/10.2307/2937895

Nazarbayev, N.A. 2012. Strategy Kazakhstan 2050: a new political policy of the taken place state. The message of the President of the Republic of Kazakhstan.

Non-standard employment forms. 2017. Problem analysis and solution prospects in different countries. Review version. International Labor Office. Geneva: ILO, www.ilo.org/wcmsp5/groups/public/

Nurmagambetov, A.M. 2018. Labor market: legal problems and Prospect. Almaty: Baspa. 263. Official website of the Committee on Statistics of MNE of RK, http://stat.gov.kz.

Pritvorova, T., Bektleyeva, D. & Dyusembayeva, A. 2016. Specificity of informal employment as one of the forms of non-standard employment in the conditions of postindustrial economy. Management and Business Administration, 2(10): 154-161.

Situation in labor market. 2017. http://www.kazpravda.kz/fresh/view/situatsiya-na-rinke-truda

Smirnykh, L. 2016. Non-Standard Employment Agreements: Employment Growth or Wage Cuts. Moscow. 36.
Social benefits in case of job loss, 2019. http://egov.kz/cms/ru/articles/allowance.

Vishnevskaya, N. 2015. Self-Employment in Transition Economies. WE&IR. 3(10): 58–67

Yemelina, N.K., Omarova, A.T., Kurmanalina, A.K. 2018. Modelling of Sustainable Development. Journal of Environmental management and tourism, 1(25): 124-129. https://doi.org/10.14505/jemt.v9.1(25)15

Zijl, M., Van den Berg, G. & Heyma, A. 2014. Stepping Stones for the Unemployment. The Effect of Temporary Jobs on the Duration until Regular Jobs. Bonn: IZA. 259p.

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T TOOLS TO ENSURE THE ECONOMIC SECURITY OF THE OLD INDUSTRIAL REGIONS

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Abstract. The purpose of the work is to base the selection of adequate tools of state support for the development of old industrial regions - the territories on which the industries related to the "outgoing" technological structures are concentrated. It is shown that the complexity of the tools selection aimed at ensuring the economic security of old industrial regions is reasoned by the heterogeneity of their composition. With the application of key postulates of synergetics it is justified that the tools of state support for regional development are most effective if they are used at the bifurcation point. It is argued that the bifurcation state is characterized by an increase in threats to the sustainable functioning and development of the regional socio-economic system and a decrease in the level of economic security in the region. A system of indicators for assessing the economic security state of old industrial territories was proposed, by using of which the nature of their development was diagnosed and it was argued that the regions are instable and objectively need government support in order to reach the trajectory of sustainable socio-economic dynamics. The importance of such selection is proved and as a condition to ensure the success of the transition process carried out by the region the toolkit of differentiated state policy for the development of old industrial regions is proposed.

Keywords: old industrial region, economic security of the region, differentiated regional policies, synergetics, countries of the Eurasian Economic Union (EAEU).

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1. Introduction

The priorities of the state economic security policy are proclaimed in the Strategy of Economic Security of the Russian Federation for the period until 2030, one of the key areas of which is to achieve a balanced spatial and regional development of the country, strengthen the unity of its economic space (Presidential Decree, 2017). The implementation of this aim requires the implementation of a set of measures to ensure sustainable, safe socio-economic development at the level of specific territories - regions and municipalities.

In modern conditions, it is of particular interest to substantiate the selection of adequate instruments for the development of old industrial regions - territories where highly specialized industries are concentrated, related to the "outgoing" technological patterns (Sorokina, & Latov, 2018). The dominance of "old" industries in the structure of the regional economy worsens the conditions for their sustainable development, creates difficulties in the competitive struggle for investment, labor resources, new technologies. In the scientific literature (for example, in (Hu, & Hassink, 2017)), this development of the region is called the QWERTY effect.

Recognition of the objective reasons for the slowdown in the economic dynamics of the old industrial regions led to the adjustment of the priorities for regional socio-economic policy in Europe, as well as developing countries in Asia, primarily in China.

Foreign researchers of the problems faced by the European old industrial regions, in particular, M. Steiner (1985), R. Hamm & H. Wienert (1990) and others (Naydenova, 2007), drew the attention of politicians to the difficulty of adapting this class of territories to new economic conditions, relying only on regional potential and internal resources.

That is why in the second half of the twentieth century in leading European countries, in particular, France, Germany and the UK, government programs have been initiated to support old industrial areas. It should be noted that these programs took into account the historical features of the specific territory development, as well as specifics of the measures for state regional and industrial policy already implemented before. As a result, in France and Germany, government support for the old industrial regions was aimed at encouraging related diversification through the development of related industries; in the UK by unrelated diversification through support for industries unrelated to the main industry specialization of the regional economy, as well as the services sector.

In PRC the stagnation of old industrial territories was caused by the change in the country's foreign economic course at the end of the 1970s of the twentieth century, which turned industrial regions into centers of backwardness and concentration of social problems (Ostrovsky, 2015). High risks of social instability prompted the Chinese leadership to implement special support programs for oldindustrial areas, and in 2003 to develop a strategy for reviving the Northeast and other old industrial bases of the country (Law-Lib, n. d.), which included, in particular, measures to reform the economy of resource-type cities, construction of infrastructure, assistance in enhancing interregional relations and other measures. The currently implemented Thirteenth Five-Year Plan for the Socio-Economic Development of China (2016–2020) provides the measures to improve the efficiency of enterprises located in old industrial areas, improve the business environment and develop human capital (The State Council of the People's Republic of China, n. d.). The need to encourage the participation of old industrial regions in the project "One Belt - One Way" (Ivanov, 2013) was particularly noted.

World experience shows that sustainable, safe social and economic development of old industrial regions is ensured by "embedding" new industries that produce high-tech output into the established "industrial frame" of the regional economy (Birch et al., 2010; Raszkowski, Bartniczak, 2018; Mariotti et al., 2018, Tvaronavičienė,

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2019). Thus, the positive dynamics of the old industrial regions become a significant factor in reducing the "gaps" in the socio-economic development of the regions and smoothing the quite substantial inter-regional differentiation, which is a traditional characteristic of the Russian Federation. This problem is relevant not only for Russia, but also for a number of countries of the Eurasian Economic Union (EAEU), in particular, the Republic of Kazakhstan.

Research hypothesis: the tools for ensuring the economic security of the old industrial regions provide the highest efficiency if they are used at the bifurcation point - a state in which the regional system gets the opportunity to reach a new higher level of development.

2. Methods

The specificity of the research approach lies in the fact that it reflects the dynamic view of economic security as a socio-economic system that develops in space and time. This allows you to use a comparative method (Bondaletov, 1983) to study the problems of economic security of old industrial regions and implement their typologization by identifying common stages in their specific socio-economic development. The official statistical reporting for the 5-year period acted as the information basis for the study to ensure the comparability for which the period 2013-2017 was chosen. In accordance with the comparative analysis methodology (Smelser, 1976), a sequential series of operations for grouping and summarizing empirical data was implemented, which made it possible to specify old industrial regions from the wider system of Russian regions, differentiate them in the structure of the administrative-territorial division of the Russian Federation (by federal districts) and thereby ensure comparability of used statistical indicators and analytical information. For the purposes of comparative analysis, indicators of the Russian economic were chosen as basic parameters. This made it possible to provide a comparative description of different old industrial types of territories, to identify similarities and differences in the dynamics of their socio-economic development and to classify them in order to justify the priorities of the differentiated support for the old industrial regions of the Russian Federation.

3. Research results

Analysis of the historical features of the formation and specificity of the modern socio-economic development of old industrial regions of Russia allows us to distinguish the following classes (Table 1).

Table 1. Classification of old industrial regions of Russia

Class of regions	Key features
Highly promising old industrial region with the potential to diversify the economy	Areas where traditional industries, which form the basis of the regional economy, and new high-tech industries are developing in a comprehensive manner, reinforcing each other and creating an internal impetus to the development of the region
Promising old industrial region with the potential to expand the composition of the "sectoral core" of the economy	Areasin which high-tech industries are developing, oriented towards the industrially developed "sectoral core" of the regional economy, which contributes to its diversification on the basis of the inclusion of high-tech industries and activities into the regional specialization sectors
A promising old industrial region with a development potential based on the inclusion of the service sector in the "sectoral core" of the economy	Areas with a developed industrial infrastructure, which ensure a positive impact of the infrastructure on the industrial-oriented "sectoral core" and the economy of the region as a whole

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Moderately promising old industrial region with growth potential in the framework of the "sectoral core" of the economy	Areas in which the basis of regional economy is formed by traditional industries (branches of the outgoing industrial structures) that do not provide sufficient levels of employment and incomes of the population. Prospects for regional development associated with the production of products for the domestic market
Insufficiently promising old industrial region with potential for the development of the service sector	Areas characterized by insufficient production and investment activity and the lack of high-tech industries, which determines the orientation of the region to the development of the service sector
Unpromising old industrial region with a high need for federal support	Areas characterized by lagging behind the majority of industrialized regions of the country in terms of key indicators of regional development and requiring direct government regulation and support

Source: authors

Thus, the complexity of the tools selection to ensure the economic security of the Russian old industrial regions is limited by their heterogeneity, which consists in the fact that they also include highly promising areas in terms of industrial development with the potential to diversify regional economy, and unpromising regions that lag behind indicators of regional development and experiencing a high need for federal support. That is why the substantiation of the optimal composition of tools that ensure sustainable socio-economic development of a specific variety (class) of old industrial regions, and determining the appropriate moment of their use is the most important task facing regional authorities, whose competence includes the issues of ensuring the economic security of the territory's development.

In methodological terms, the most problematic is the solution of the second component of the problem - the justification of an adequate moment of specific tool (toolkit) use. It seems that it can be formulated using synergetic ideas, according to which economic security tools can provide the best efficiency if they are used at the bifurcation point - the state where the regional economy as a dynamic system acquires a new quality what is based by the "branching" of the systemic development trajectory into competitive attractors (Prigogine, & Stengers, 1986) (Figure 1):

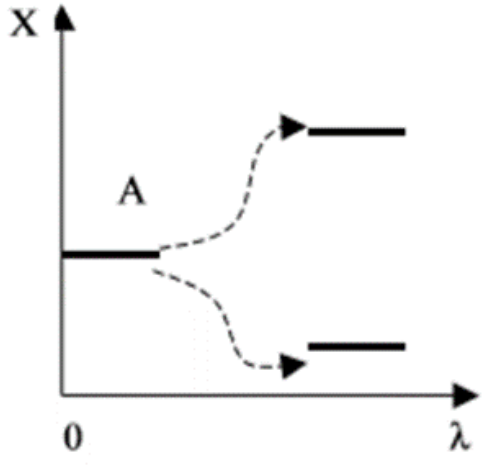

Fig.1. Variants of the regional system bifurcation development
Source: Latov, 2003, p. 102.

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The bifurcation state is characterized by an increase in threats to the sustainable functioning and development of the regional socio-economic system - this statement allows us to make two fundamentally important conclusions:

1) at the bifurcation point, the economic security (the territory's ability to withstand "crisis situations caused by external and internal factors affecting the research, production and resource potential and their structure, institutional infrastructure, social sphere, level and quality of life of people) of the region decreases (Grishin, & Gagarina, 2013);

2) the increase in the level of economic security of the region indicates the "progressiveness" of the transition and is indirect evidence of the adequacy of the attractor selection. Therefore, to assess the results of transitional processes, it is advised to use a system of indicators of old industrial region's economic security state.

In our opinion, the system of indicators for the economic security of an old industrial region should be based on a system of indicators defined by the Economic Security Strategy of the Russian Federation, having, due to the calculation methodology, a "projection" to the regional level and reflecting the specific problems of the old industrial areas development.

These indicators may include: investment in fixed assets per capita; the degree of depreciation of fixed assets; the proportion of organizations engaged in technological innovation. Also, the human development index, an indicator of international statistics that allows you to track one of the key problems of the old industrial regions — obsolescence of human capital, insufficient conditions for its effective use in the regional economy sectors should be included in the system of indicators for assessing the nature of old industrial territories development. In total the proposed indicators make it possible to track the specific problems of the old industrial regions development, such as the lack of physical and human capital to ensure the conditions for long-term sustainable socio-economic development of the territories.

Since the old industrial regions are characterized by an excess of production capacities concentrated on large and medium-sized enterprises with outdated equipment and technologies (Glonti, 2008; Economy of old industrial regions, n. d.; Komarov, & Gerko, n. d.), it is the volume and dynamics of investments in fixed assets that determines the prospects for economic development of production, the potential for producing innovative competitive products which can conquer new markets (Demidova, 2017). The dynamics of investment in fixed capital per capita by the old industrial regions of Russia is presented in Figure 2.

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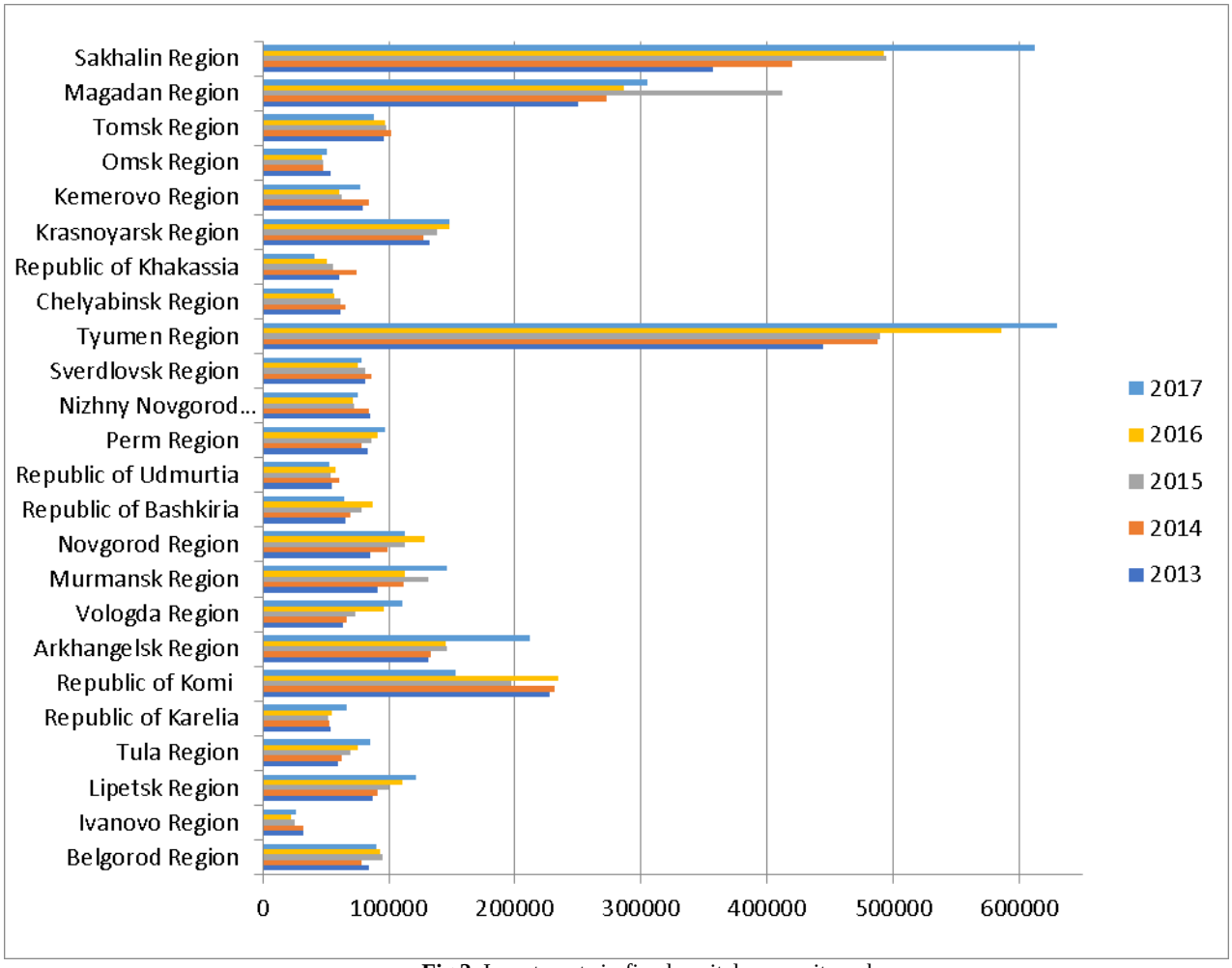

Fig.2. Investments in fixed capital per capita, rub.
Note. Hereinafter, the composition of the old industrial regions of Russia is defined according to: (Smirnova, & Lukin, 2013)
Source: Developed basing on: (Russian Federal State Statistics Service, n. d.)

According to the statistics Figure 2, a significant investment decline is observed in most of the old industrial regions of the Volga, Ural and Siberian federal districts. The fall in investment is caused by the decrease in investment activity in the sectors of regions' specialization, a lack of enterprises' own financial resources, an overestimated loan rate (Zubarevich, 2018). One of the objective reasons for the reduction of the regions' investment portfolio is the completion of a number of investment projects. Thus, in Bashkiria, many large projects (for example, hotels built for the SCO and BRICS summits) are being completed, and new ones are just being worked out (Nekrasova, 2018).

However, despite the increase in absolute values of investments, the share of investments in fixed assets in the gross regional product in most of the old industrial regions of Russia during 2013-2017 decreases (Figure 3).

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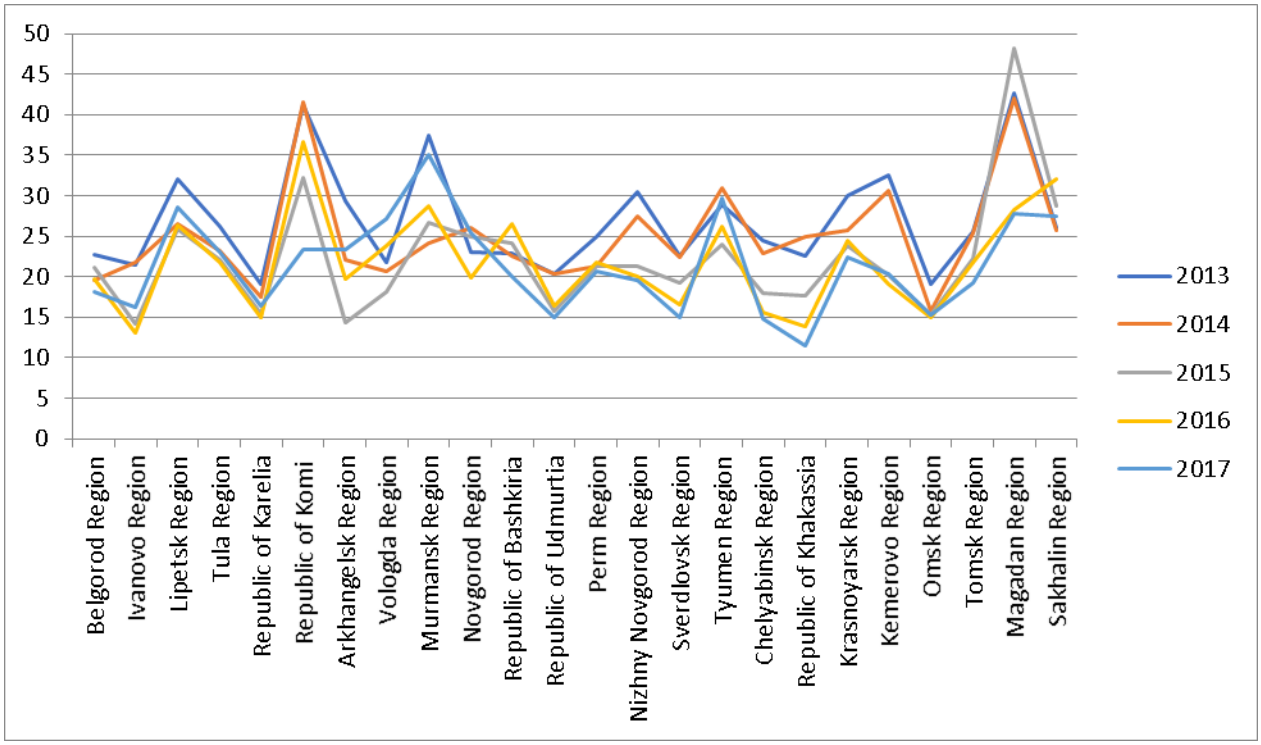

Fig.3. Share of investment in fixed assets in the gross regional product of the regions of Russia, rub
Source: Developed basing on: (Russian Federal State Statistics Service, n. d.)

According to the statistics presented in Table 3, the largest decline in the share of investments in fixed capital in the GRP is observed in the Republic of Komi, the Magadan Region, the Republic of Khakassia and the Nizhny Novgorod Region (by 17.9 percentage points, 12.3 pp., 11.1 pp, 10.9 pp). However, there is a positive dynamics of the analyzed indicator. Thus, in the Vologda Region (+5.4 pp), the Novgorod Region (+2.4 pp), Sakhalin Region (+1.4 pp) and Tyumen Region (+0.8 pp) the share of investments in fixed capital in the GRP in the period 2013-2017 increased.

The main role in the economy of the old industrial regions belongs to industries that are capital-intensive, because of what they are characterized by the presence of significant fixed assets needed for production (Bukina, 2011). In this regard, it is particularly important to study the dynamics of the indicator of the degree of depreciation of fixed assets (Figure 4):

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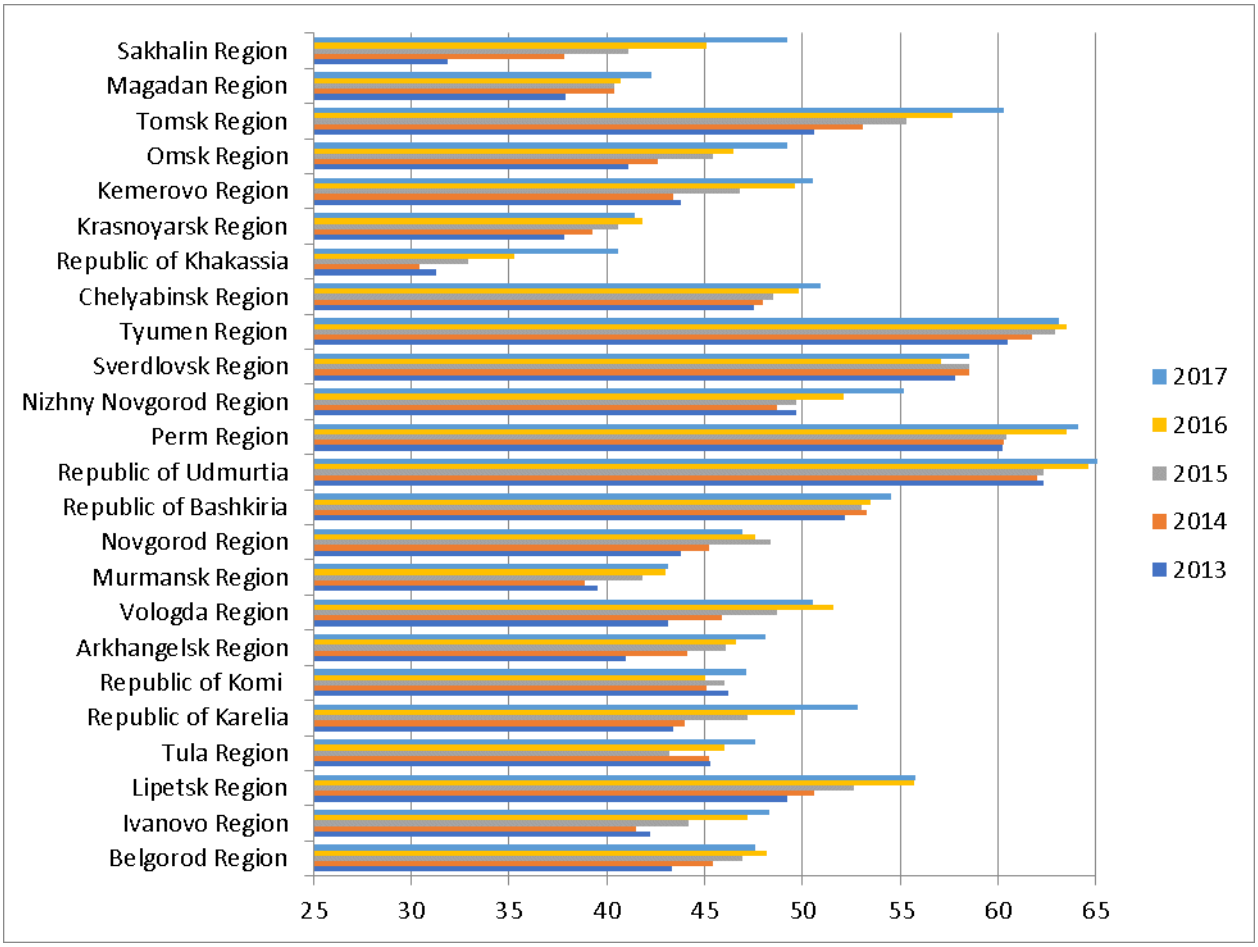

Fig.4. Degree of depreciation of fixed assets, %
Source: Developed basing on: (Russian Federal State Statistics Service, n. d.)

Analysis of the statistical data given in table. 3 shows that the degree of fixed assets depreciation of the studied regions is extremely high and the trend is negative: the figure is growing, and in some regions the growth is quite impressive. E.g. in Tomsk region the depreciation of fixed assets for the period 2013-2017. increased by 9.7 percentage points, and in Sakhalin region by 17.3 percentage points. The increase in the degree of depreciation of fixed assets is due to the reduction in the share of investments in fixed capital in the GRP of the old industrial regions (Figure 3).

At present, it is necessary to build the Russian economy into global innovation chains of technological transformations, together with the advanced countries to enter the knowledge economy associated with innovation shifts (Depreciation of fixed assets of the Russian economy exceeded 50%, 2016). These transformations are impossible without technological innovations. The dynamics of the share of organizations implementing technological innovations in old industrial regions is presented in Figure 5.

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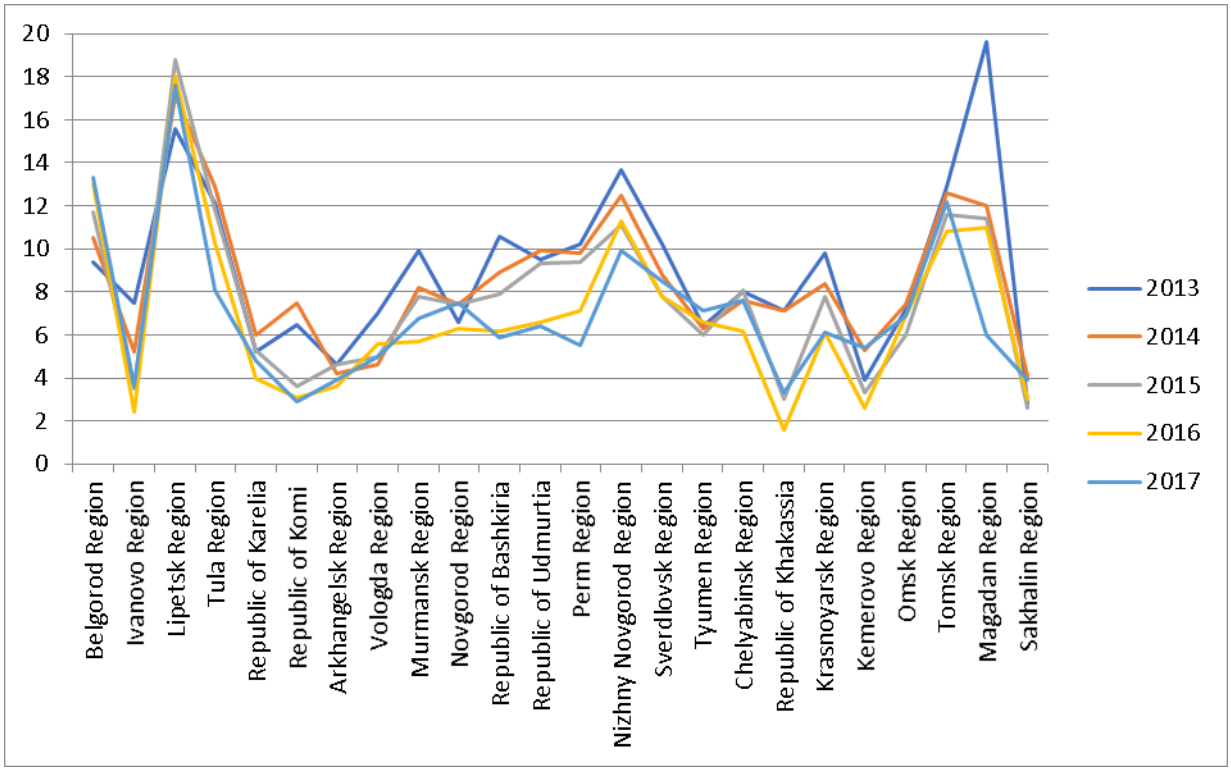

Fig.5. The proportion of organizations engaged in technological innovation, %
Source: Developed basing on: (Russian Federal State Statistics Service, n. d.)

It should be noted that in all the old industrial regions of Russia, with the exception of the regions of the Central Federal District, in the period under study there was a significant reduction in the weight of organizations implementing technological innovations. The current situation is caused by insufficient investment in modernization and reconstruction, as well as in innovative renewal of production (Terms of innovative development of old industrial regions, 2016). The lack of technological innovations is one of the key sources of threats to the economic security of the old industrial regions, complicating the process of "embedding" new industries in the established "industrial frame" of the regional economy (Prospects for the strategic development of the old industrial regions of Russia, 2012).

The human capital is the key factor in the development of science and technological innovation, the failure of which is chronically experienced in the old-industry type of regions (Figure 6), while its condition and quality determine the level of scientific and technological projects and the possibility of their implementation in the region's economy.

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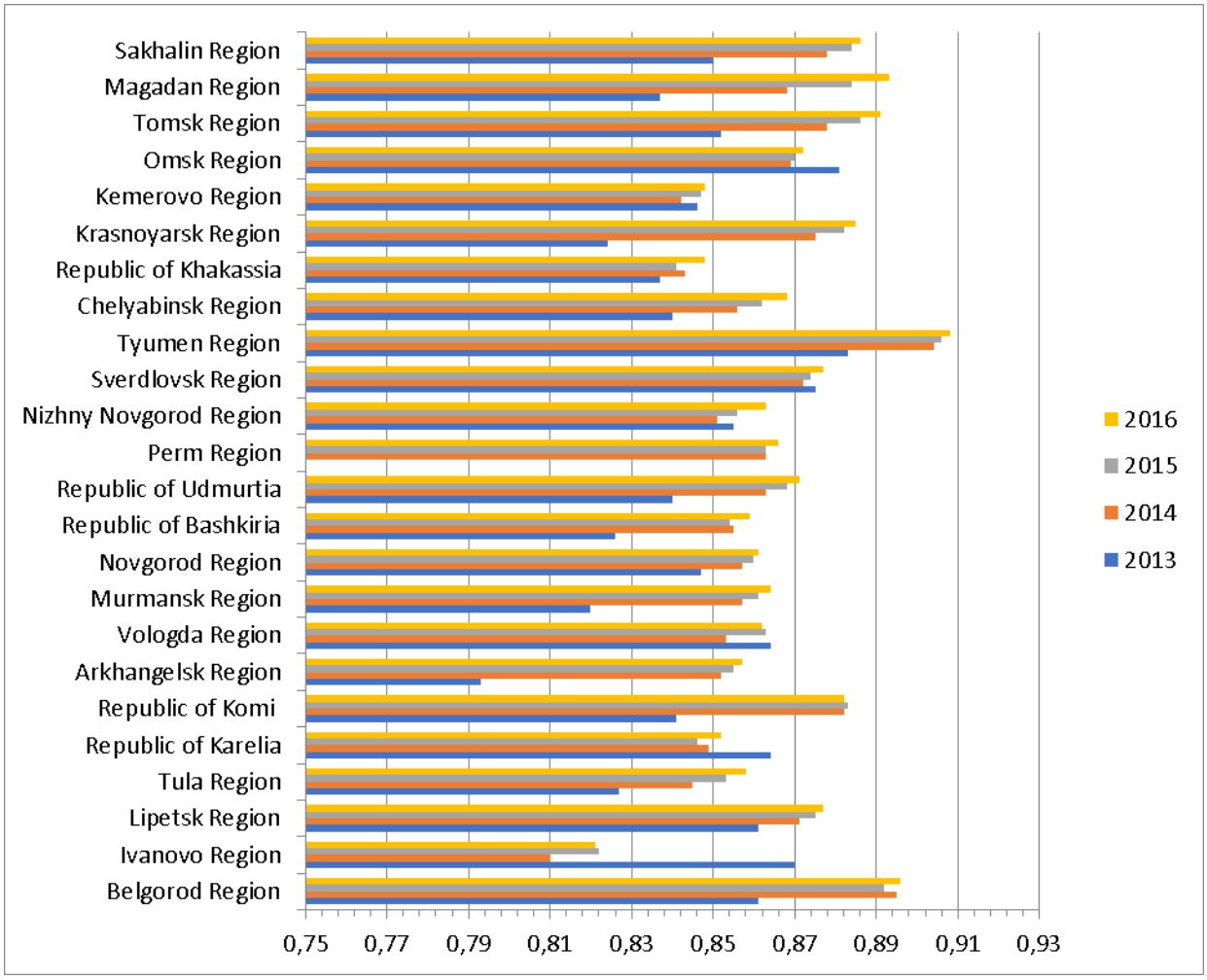

Fig.6. Human Development Index
Source: Developed basing on: (Bobylev, & Grigoriev, 2017; 2019)
Note: The calculation of the Human Development Index for the Russian regions was carried out according to the UN Development Program methodology used until 2010, due to the lack of the necessary data for the calculation by region (Bobylev, & Grigoriev, 2019)

According to the UN classification, countries with a human development index value of at least 0.8 belong to a group of countries with a very high level of human development. The statistical data presented in table 5 indicate that in most of the old industrial regions, the human development index exceeds 0.8 and during 2013-2016 its positive dynamics was noted.

Thus, the overwhelming majority of indicators of the old industrial regions economic security show negative dynamics, demonstrating that the transition process in these regions is either not yet completed, or as a result of the transition, the territory has chosen to move along a negative attractor. In both cases, it should be stated that the region is in a situation of instability and is experiencing an objective need for government support in order to enter the trajectory of sustainable socio-economic dynamics.

From the point of view of regional development state management, the authors of the synergy theory say that the selection of an attractor can occur randomly, as a result of evolutionary changes in the object, and under the influence, sometimes insignificant, from the external environment. The latter allows arguing the importance of

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choosing an adequate instrument of state support as a condition to ensure the success of the transition process carried out by a specific old industrial region (Table 2).

Table 2. The toolkit of the differentiated policy for development of Russian old industrial regions

Class of regions	Attractor	Priorities for region's state support
Highly promising old industrial region with the potential to diversify the economy	Development	Region's promotion as a participant in the national and world economy, promoting the formation of a region's positive image
Promising old industrial region with the potential to expand the composition of the "sectoral core" of the economy	Development	Support for high-tech industries of the regional economy in the framework of state macroeconomic, industrial and innovation policy programs
A promising old industrial region with a development potential based on the inclusion of the service sector in the "sectoral core" of the economy	Growth	State support for the development of transport, housing and utilities, energy regional infrastructure
Moderately promising old industrial region with growth potential in the framework of the "sectoral core" of the economy	Growth	Stimulation of production modernization in the framework of the state scientific, technical, foreign trade and macroeconomic policies
Insufficiently promising old industrial region with potential for the development of the service sector	Recession	State support for the development of the service sector in the region, promotion the improvement of human resources, infrastructure and social services
Unpromising old industrial region with a high need for federal support	Decay	Direct state support of social infrastructure, assistance to the population

Source: authors

"Development" attractor is characterized by the emergence of positive qualitative changes in the regional socio-economic system as a result of the progressive transition from one class of old industrial regions to another. The result could be the formation of a new territory type - a new industrial region, the development of which is based on the capitalization of knowledge and the effective realization of human potential in the economy's industrial sector. The most important condition for the selection of this attractor is government support for high-tech industries of the regional economy as part of state macroeconomic, industrial and innovation policy programs, as well as promoting the region as a participant in the national and global economy, promoting its positive image and implementing other institutional measures aimed at promoting the region nationally and internationally.

"Growth" attractor is characterized by a predominance of quantitative changes, while their presence implies (although not guarantees) improvement over time of the regional economy's qualitative parameters and an increase in the welfare of the population. Prospects for regional dynamics are associated with the transformation of the old industrial region into a dynamically developing industrial center with a diversified sectoral structure which ensures an increase in the production knowledge intensity and, on this basis, the transition to new, more promising technological structures. The implementation of this scenario requires state support for transport, housing and utilities, regional energy infrastructure and the promotion of "traditional" industries modernization within the framework of state scientific and technical, foreign trade and macroeconomic policies. Of particular importance is the role of the state in preventing the degradation of socio-and economic potential of the old industrial region at the beginning of the transition period.

"Recession" attractor is characterized by negative dynamics of old industrial region's industries development. An analysis of the historical experience of old industrial type of Russian and foreign regions shows that this transition trajectory is usually followed by regions which development priorities lie not in the production sector, but in the service sector. Insufficient production and investment activity, the lack of high-tech industries in the structure of the regional economy cause the weakness of the industrial sector in the area. If this does not contradict the national interests of the state, then the support for this transition trajectory consists in creating conditions for the development of the regional services sector and the formation of the service specialization of the region.

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"Decay" attractor is a feature of old industrial regions, which demonstrates a chronic lag behind most industrial areas of the country in terms of regional development key indicators. These regions, which have all the signs of depression, need direct state regulation, which consists in maintaining jobs at the city-forming enterprises in the region; assistance in the implementation of industrial policy, as well as programs to support small and medium-sized businesses; social support of the population in order to prevent mass poverty and poverty, etc.

The situation in the Republic of Kazakhstan is in many respects similar to the Russian one, with the only difference that the old industrial regions in the republic are few and the regional policy in their relation is mainly mediated by the large influence of external factors, including geopolitical ones. Old industrial regions include Eastern and Central Kazakhstan. Thus, the territory of the region, referred to in the past as the Ore-Altai Territorial Production Complex (TPC), fits well into the classification of old industrial regions of Russia and belongs to the high-prospective class of old industrial regions with the potential to diversify the economy. Prospects for the regional dynamics of the region are connected with its transformation into a dynamically developing industrial center with a diversified industry structure ensuring an increase in the output of intelligent products and on this basis a transition to new, higher technological structures. Construction of a full-cycle automobile complex for the production of Lada cars in Ust-Kamenogorsk can be considered the beginning of this project, contributing to the gradual accumulation of positive qualitative changes in the socio-economic system of the region and the country as a whole. The results of the coming changes in Kazakhstan can be formation a new type of territories – a newly production region, development of which shall be performed on the base of statues and principles, proposed by Russian scientists. Unfortunately, the Republic was not able to perform a wide diversification of the economy and cannot rely on economy's new growth points, based on modernization. Kazakhstan is under threat of technological dependence of the more developed countries, that is why the scientists face the necessity to search the new models of state development, increase the effectiveness of tools to secure the economic security of old-industrial regions, which, despite the small number, stay the key components of Kazakh economy.

Here can be remembered the Ore-Altai region, territory of former Karaganda-Timertau territorial productive cluster, which lost most part of production potential during the years of independence. The base of technological and economical base of state are still the industrial and technologic complexes and production points in the Kazakhstan Republic located along the border with Russian, which formed in the Soviet time and border the old-industrial regions of South Ural and other Russian production regions. To include the Republic not only into new innovative productions but also the world innovative and technological chain the Kazakhstan economy needs a qualitative jump in the development of production forces, in which the management forms and methods are being improved, thus the necessity of technologic pattern shall be transformed. Kazakhstan's lie back in the innovative development is also connected with the lack of system normative and law base which regulated science sector. The comparison analysis of science-technological activities of Kazakhstan and other developed countries showed that the development of national system to support and implement the innovation in the Republic is at a very initial stage.

4. Discussion of the results

A good example of the region that selected the "development" trajectory is the Kaluga Region, which is currently making the transition from a predominantly traditional-industrial model to an innovative, "new industrial" type of development based on the capitalization of knowledge and the effective realization of the human potential of the territory. Meanwhile, a significant number of old industrial regions of Russia follow the "stagnation" attractor, in particular, we are talking about the Voronezh Region, the industrial complex of which is characterized by low competitiveness due to the dominance of traditional industries based on the outgoing (fourth) technological structure.

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Similar results were obtained in the study of the dynamics of industrial regions in the Republic of Kazakhstan (Nugerbekova et al., 2008). At present, Kazakhstan is experiencing the initial stage of transition of the economy from the raw material to the innovative type of development, while the republic has not formed a nation-wide multi-level model of the spatial organization of the country's territory. Kazakhstan, similarly to Russia, needs the formation of a toolkit of a differentiated state policy for the development of old-industrial regions as a condition of ensuring the success of the transition process. This will make it possible to develop programs for the transformation of old industrial regions, including border regions with Russia, in the direction of enhancing innovation potential and effectiveness of economic security instruments, taking into account the special features of the territories. Such an approach, in our opinion, will enhance the role of the state in preventing the degradation of the social and economic potential of the old industrial regions of Kazakhstan in the foreseeable future within the framework of the EAEU.

Conclusions

In the article, based on the analysis of empirical material, the hypothesis is argued that the most effectiveness of tools to ensure the economic security of old industrial regions is provided at the bifurcation point - a state in which the regional system gets the opportunity to reach a new, higher level of development.

It has been substantiated that threats to the economic security of the region sharply increase at the bifurcation point, because of what it is feasible to use a system of indicators of the state of economic security of the region to assess the results of the transition processes. The problem is that, until now, there has not been formed a unified system of indicators for assessing the state of the region's economic security, either at the legislative level or by an authoritative scientific community. To assess the state of economic security of old industrial territories, a system of indicators has been proposed, based on a system of indicators from the Economic Security Strategy reflecting the specific development problems of old industrial type territories. These indicators include: fixed capital investment per capita; the degree of fixed assets depreciation; the proportion of organizations implementing technological innovations, as well as the human development index - an indicator of international statistics that makes it possible to track the dynamics of human capital, one of the most important sources of development of the region of the old industrial type.

Analysis of the dynamics of economic security indicators in the old industrial regions of Russia showed that the overwhelming majority of them show negative dynamics, indicating that the regions are in a situation of instability and experience an objective need for government support in order to enter the trajectory of sustainable socio-economic dynamics.

In the system of regional management, the choice of regional development attractor is largely determined by the choice of an adequate instrument of state support as a condition ensuring the success of the transition process carried out by a specific old industrial region. This statement is true both in relation to the old industrial regions of Russia, and a number of other countries, in particular - the Republic of Kazakhstan.

The proposed approach makes it possible to substantiate the optimal composition of state support measures ensuring the sustainable socio-economic development of old industrial regions and to specify the appropriate moment for their use, which will contribute to the formation of an efficient state regional policy considering the special features of the territories in the interests of Russian national economy development.

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http://doi.org/10.9770/jesi.2019.7.1(53)

References

Birch, K., MacKinnon, D., & Cumbers, A. (2010). Old industrial regions in Europe: a comparative assessment of economic performance. Regional Studies, 44(1), 35-53.

Bobylev, S.N., & Grigoriev, L.M. (Eds.). (2019). Human Development Report in the Russian Federation for 2018. Moscow: Analytical Center under the Government of the Russian Federation. Retrieved from: http://ac.gov.ru/files/publication/a/19663.pdf

Bobylev, S.N., & Grigoriev, L.M. (Eds.). (2017). Human Development Report in the Russian Federation for 2017. Moscow: Analytical Center under the Government of the Russian Federation. Retrieved from: http://ac.gov.ru/files/publication/a/15600.pdf

Bondaletov, V. (1983). Comparative method. In Russian Onomastics: Textbook. Moscow: Enlightenment, 653p.

Bukina, T.V. (2011). The specifics of the economic development of the old industrial region (on the example of the Perm region). Retrieved from: http://ars-administrandi.com/article/Bukina_2011_2.pdf

Demidova, M. (2017). Investment dynamics is a significant economic category. Its change and characteristics. Retrieved from: https://moneymakerfactory.ru/biznes-plan/dinamika-investitsiy/

Depreciation of fixed assets of the Russian economy exceeded 50%. (2016). Retrieved from: http://kemerovo.bezformata.com/listnews/osnovnih-fondov-rossijskoj-ekonomiki/52941189/

Economy of old industrial regions. (n. d.). https://economics.studio/ekonomika-regionov/ekonomika-staropromyishlennyih-regionov.html

Glonti, K.M. (2008). Old industrial regions: problems and development prospects. The problems of federalism. Russian Journal of Regional Studies, 4. Retrieved from: https://regionsar.ru/ru/node/197

Grishin, V.I., & Gagarina, G.Y. (Eds.). (2013). Russian economic space: problems and prospects for restructuring. Moscow: INFRA-M.

Hamm, R., & Wienert, H. (1990). Strukturelle Anpassungaltindustrieller Regioneniminternationalen Vergleich. Schriftenreihe des Rheinisch-West fälischen Instituts für Wirt schafts forschung. Berlin: Essen.

Hu, X., & Hassink, R. (2017). New perspectives on restructuring of old industrial areas in China: a critical review and research agenda. Chinese Geographical Science, 27(1), 110-122.

Ivanov, S.A. (2013). Northeastern provinces in the regional policy of the central government. At the map of the Pacific Ocean: inform.-analyt. bullet, 30(228), 4-7.

Komarov, I., & Gerko, A. (n. d.). Old industrial areas of Russia. Retrieved from: http://old.nasledie.ru/oboz/N13_94/13_10.HTM

Latov, Y.V. (2003). Russia of the 1990s: underdevelopment through decline or development through recession? Economic Bulletin of Rostov State University, 1(1), 100-115.

Law-Lib. (n. d.). Opinions of the CPC Central Committee and the State Council regarding the implementation of the strategy of reviving the Northeast and other old industrial bases (Document of the CPC Central Committee 2003, No. 11). Retrieved from: http://www.law-lib.com/law/law_%20view.asp?Id=87054

Mariotti, S., Nicolini, M., Piscitello, L. (2018). The Role of the Heterogeneity of Services in the Transmission of Spillovers to Domestic Manufacturing Companies. Transformations in Business & Economics, 17, (2-44), 194 -209

Naydenova, R.I. (2007). State regulation of the economy in the old industrial areas of Germany. Retrieved from: http://jurnal.org/articles/2007/ekon7.html

Nekrasova, E. (2018). Bashkiria in the investment peak. Retrieved from: https://regnum.ru/news/2400066.html

Nugerbekova, S.N., Temirkhanova, E.U., Bapiyeva, J.K., Kasymova, & Nadyrova, Sh.M. (Eds.). (2008). Spatial organization of the territory and resettlement of the population of the Republic of Kazakhstan until 2030 (Vol. 1: The concept of spatial development and resettlement of the population of the Republic of Kazakhstan). Astana: Economic Research Institute JSC.

Ostrovsky, A.V. (2015). China: the economy of the regions. Moscow: LLC Publisher IBA, 345p.

Petrenko, Y., Vechkinzova, E., Antonov, V. (2019). Transition from the industrial clusters to the smart specialization of the regions in Kazakhstan. Insights into Regional Development, 1(2), 118-128. https://doi.org/10.9770/ird.2019.1.2(3)

Presidential Decree of 13.05.2017 N 208 "On the Strategy of Economic Security of the Russian Federation for the Period up to 2030". (2017). Retrieved from: http://www.consultant.ru/document/cons_doc_LAW_216629/.

Prigogine, I., & Stengers, I. (1986). Order from chaos. A new dialogue of man with nature. Moscow: Progress.

Prospects for the strategic development of the old industrial regions of Russia. (2012). Retrieved from: http://bujet.ru/article/212308.php

Raszkowski, A., Bartniczak, B. (2018). Towards Sustainable Regional Development: Economy, Society, Environment, Good Governance Based on the Example of Polish Regions, Transformations in Business & Economics, 17, (2-44), 225-245

Russian Federal State Statistics Service. (n. d.). Russian regions: Socio-economic indicators 2018. Retrieved from: http://www.gks.ru/bgd/regl/b18_14p/Main.htm.

Smelser, N. (1976). Comparative Methods in the Social Sciences. Englewood Cliffs, 365 p.

Smirnova, T.G., & Lukin, E.V. (2013). Problems of recovery growth of the manufacturing industry of the export-oriented region. Economy and Entrepreneurship, 4, 162-173.

Sorokina, N.Y., & Latov, Y.V. (2018). The evolution of old industrial regions in the Russian economy. Journal of Economic Regulation, 9(1), 6-22.

Steiner, M. (1985). Old Industrial Areas: A Theoretical Approach. Urban Studies, 22(5), 387-398.

Terms of innovative development of old industrial regions. (2016). Retrieved from: https://bizboss.ru/biznes/usloviya-innovatsionnogo-razvitiya-staropromyshlennykh-regionov/

The State Council of the People's Republic of China (n. d.).The 13th five-year plan for the social and economic development of the PRC. Retrieved from: http://www.gov.cn/xinwen/2016-03/17/content_5054992.htm

Tvaronavičienė, M. (2019). Insights into global trends of capital flows' peculiarities: emerging leadership of China. Administratie si Management Public, (32), 6-17. https://doi.org/10.24818/amp/2019.32-01

Zubarevich, N. (2018). Where the financial rain fell. Retrieved from: https://rg.ru/2018/03/12/kakie-regiony-poluchili-bolshe-vsego-investicij-v-2017-godu.html

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METHODS AND INSTRUMENTS OF GOVERNMENT CONTROL OF GRAIN PRODUCTS SUBCOMPLEX

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Abstract. It is known that the need to manage the sustainable development of the grain economy actualizes the search for effective solutions to problems and achieve socio-economic indicators of the functioning of all structures of the agro-food complex of the country. That is why in the conditions of deformation of market conditions and globalization of the economy grain production as a complex multifunctional and dynamically changing system that performs a wide range of economic functions, should be given priority by the government. This is particularly important in view of the fact that the unfavourable macroeconomic conditions for grain farming created during the initial period of market reforms contributed to the serious destruction and degradation of its production potential, which actually led to an aggravation of the crisis situation in the reproduction process. However, in the recent period, the existing system of grain farming has become more actively subject to improvement, including through the implementation of a multidimensional state grain policy, including its price, tax, credit, financial, insurance and tariff components. At the same time, agricultural producers have the opportunity to take advantage of more affordable short-term and long-term loans, to attract budget subsidies to repay part of the fixed interest rate on previously attracted loans, as a result of which a certain positive trend was noted for the financial recovery of agricultural (crop) and grain processing enterprises.

Keywords: grain policy; grain products subcomplex; regulation; conjuncture; mechanism; grain market; conditions; subjects; methods; tools; impact; prices; raw materials; competition; processing

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JEL Classifications: RS1, RS2

1. Introduction

According to analysts, positive trends in the economy of the Republic of Kazakhstan are largely due to various progressive forms of support for farmers and crop processors provided by the state. This is also facilitated by the creation of large cooperative and integrated formations uniting organizations in various areas of grain farming that carry out the entire cycle including the production and sale of grain and its products to the final consumer. At the same time, the existing potential and current level of grain farming are practically ensured today by the use of material resources, financial savings, scientific and technical achievements of the past period. Formation of

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sustainable development trends is also influenced by investments of private capital and competent state support. However, this is obviously not enough to create a solid basis for accelerated innovative growth of the grain production in tactical and strategic perspective.

2. Methods of research

Therefore, monitoring and systemic assessment of the current state, as well as identification of trends and major problems in the development of the domestic grain subcomplex are needed in order to develop promising recommendations for improving the methods and tools of its state regulation under the changing market environment. According to scientists, the stability of grain production can be characterized as an ability to continuously maintain optimal proportions of grain production and consumption, resist effects of internal and external negative impacts, and adapt to dynamically changing natural and economic conditions, which determine the production and sale of different grains (Ushachev et al. 2017, 2018).

Noting the positive trends, let us once again emphasize that the current situation in the crop production of the republic still does not allow making conclusions optimistic for the industry. The indicators characterizing the harvest of 2018 are significantly below the expected level. In particular, 22.8 million tons of initial weight grain were harvested, which was 760 thousand tons or slightly more than 3% higher than in the previous period. The grain yield was 15.1 centners per hectare, which was 0.6 centners per hectare or 4% higher than the value of the same period. At the same time, the indicators under study had a negative trend in a number of Kazakhstan regions.

High variability of the grain production indicators and instability of its dynamics can adversely affect the market situation in the domestic grain subcomplex resulting in increased commercial risks and requiring introduction of administrative measures aimed at regulating the volume of grain production and sale. Sustainability of the sectoral production can be ensured only taking into account the possible arrhythmia of natural production factors, presence of market fluctuations in demand, supply and prices, systemic impact of the risks, and taking measures to implement the necessary state support for the grain industry development under the conditions of active government grain market regulation. According to foreign agrarians, effective functioning of the grain subcomplex is ensured by active intervention of the state authorities (Tireuov et al. 2018).

3. The discussion of the results

At the beginning of the formation and strengthening of the socially-oriented market economy, the state regulation expediency was objectively determined by the nature of mixed economy combining the competition and freedom of choosing a buyer and a seller with simultaneous demand to ensure equal conditions of functioning and protection forall grain farming subjects acting within the legal field without exceptions, and perform social functions to protect the low-income population by the state.

Complexity and diversity of the tasks set under the conditions of further development of the economic relations in the grain farming segment causes the emergence of a number of contradictions. We are listing the most acute of them.

For example, individual economic entities' desire to seize the leading position may result in a deformation of the perfect competition and its replacement by a monopoly power practically unacceptable in the market economic conditions. Production and financial-economic differentiation of the economic entities contributing to the bankruptcy of some of them as a result of the fierce competition actualizes the formation of an effective mechanism for ensuring the social protection for the vulnerable population groups.

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The lack of market methods and instruments elaboration for the implementation of the regulatory impact on the reproductive process results in an increase in environmental risks, slowdown in the development of the fundamental science, education, health care and other branches. The lack of capital consolidation prevents the development of scientific and technological progress and practical realization of its most significant achievements in the form of technical, technological, raw material, product, managerial and social innovations.

Since the process of resolving these contradictory situations cannot be carried out only with the use of market self-regulation mechanisms, it requires adequate regulatory influence by the state aimed at observing public interests.

Currently, there are trends determined by peculiarities of the market economy and aimed at achieving maximum profit, thus contributing to the increase in the spontaneity of the grain production specialization. The study of the advanced countrypractices has allowed developing recommendations for strengthening the role of the state in regulating the grain product subcomplex (Bogomolova et al. 2016, 2017). Among them, it is necessary to highlight the need to develop government programs aimed at increasing the production of certain types of grain; expansion of the measure range for improvement of the public procurement organization with maintaining the level of guaranteed prices; introduction of export quotas and adoption of tax legislation; carrying out activities that allow raising prices in the domestic market, thus stimulating the domestic consumption of cereals as a raw material for other industries.

An assessment of the current situation in the world grain production allows statinga growing role of the grain and its products in the economy of Kazakhstan. Therefore, in order to enhance the industry's role in the world market, it is necessary to develop a national grain policy making all economic entities of the domestic grain economy economically interested in its realization since it is impossible to ensure highly efficient functioning of the considered socially important business area without this support.

One of the elements of implementing such a policy was allocation of additional 20 billion tenge in 2018 under a total microlendingcost of 62 billion tenge. The state is also providing concessional loans for the implementation of the Program forProductive Employment and Mass Entrepreneurship adopted for 2017-2025.

A requirement of the State Grain Policy is the need to focus on the sustainable and effective functioning of not only the grain farming, but also related industries, as well as formation of a highly developed grain market providing more complete and guaranteed satisfaction of the country's needs for various grain and expansion of its exports.

The State Grain Policy should define clear guidelines for the development trends, quantitative and qualitative parameters of production, volume of distribution, degree and directions of its use. The state policy must be based on the principles of protectionism in relation to the production and marketing of high-quality and scarce grain. It should determine specific forms and effective methods for exercising the state influence on the grain market, forming a reliable system of interaction between the government bodies, business community and agricultural producers.

It should be legislatively adopted, have a successive and consistent nature, ensure the implementation of all activities planned and envisaged by the state, be a special guideline of the integrative functioning and a development guarantor for all participants of the agrifood market including the grain market as its major component (Mizanbekova et al. 2015, 2016, 2017).

The global experience clearly confirms that the currently emerging model of the Kazakhstani economy based primarily on the parity of exporting raw materials and fuel resources with importing food cannot be really

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strategically effective, so drastic changes are required for its development. We also note that food dependence is especially dangerous in the modern period, when food and raw materials for its production are increasingly becoming a key factor in the possibility of political and economic pressure in foreign policy relations. This conclusion can be confirmed by the following statistical information (Bykov 2018). The economically developed countries consume more than a half of the food produced in the world, while no more than 20% of the world's population live in them. In addition, the threatening trends can escalate dramatically if we take into account that one seventh of the world's inhabitants are undernourished or almost starving today, and according to forecasts, their number may increase by one and a half or more times in the next ten to fifteen years.

In this regard, we consider it necessary to name the following areas among the complex of the main ones having positive impact on the development of the grain subcomplex (Altukhov 2014; Altukhov et al. 2015). First of all, it is important to pay attention to the organization of a system allowing the manufacturers to orient themselves towards the production of the grain types able to satisfy the highest demand for them and ensuring their production in the planned volume that guarantees theircomplete sale. This will enable rural producers to reduce the risks of uncertainty in the formation of the grain production structures, as well as likelihood of irrational costs or reduction in the efficiency of labor, materials and financial resources due to the production of undemanded types of grain. To resolve this issue, it is advisable to carry out periodic (once a week, a month, etc.) publishing of informational bulletins containing information on the situation trends emerging in the grain markets of the RK, as well as countries of near and far abroad (Mizanbekova et al. 2018).

In order to maximally approximate the structure of grain production to the emerging need for particular types, mechanisms ofdirect link establishment without participation of numerous intermediaries should be used. Due to the fact that economic relations between the producers and consumers of grain are manifested in the grain subcomplex, a clear coordination of their economic interests is necessary. On the one hand, the formation of these relations is basedon the availability of grain and its products supply; on the other hand, it is the existing demand for them. We believe that the specific object of the state influence implementation should be the sale of grain. In this regard, measures should be developed first of all to improve the socio-economic and financial relations between the producing enterprises and enterprises involved inthe storage, processing and transportation. However, under a shortage of grain storage facilities and capacities for ensuring the post-harvesting processing in certain areas of the country, today it is necessary to find money for commensurate support of individual economic entities with elements of public and private partnership in the creation of granaries in the production areas.

We believe that commodity exchanges engaged in the wholesale trade of grain can be important elements of the grain subcomplex sustainable development and adaptation of the partners' economic relations system to the changing conditions. Systematic functioning of the commodity exchanges allows determining the market prices, sharing operational information about their levels and trends and carrying out insurance operations for the sellers and buyers against possible negative consequences of sharp fluctuations in the market prices for grain. Interregional and interstate communications should also be constantly expanded as effective means of the grain subcomplex development requiring the creation of a reliable information support system related to the issues of geography and movement of the grain flows, capacity of the grain markets in general and their individual niches by types and quality indicators under the digital economy, as well as the level of the prevailing market prices for grain.

As noted earlier, grain plays anespecially significant role in ensuring the state's food independence; therefore, it is traditionally considered as a classic exchange commodity. At the same time, it is worth noting that the above-mentioned basic functions of the exchanges can be effectively performed only under the absence of two grain markets existing inparallel (both the exchange and non-exchange ones) (Krylatykh, Strokov 2012; Taipov 2018). The presence of almost uncontrolled non-exchange market can result in the creation of conditions when numerous

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grain dealers receive proportionate and in some cases larger incomes from resale operationsthan agricultural producers of grain.

By organizing the concentration and centralization of relatively large quantities of grain, the commodity exchanges unite and control the movement of grain, and receive information about cash flows through an established and fixed system of direct and inverse links between the economic entities of the grain subcomplexon this basis. Using the mechanism of price quotes, the exchanges unite the producers and consumers of grain and facilitate the processes of tactical and strategic forecasting of their business results taking into account current situation factors in the industry market. In addition, the exchanges also perform a number of other supporting functions. For example, in order to ensure the conditions necessary for effective functioning of exchange trading, their employees develop standards for grain and terms of standard contracts, they establish rules for trade organization, perform arbitration functions and provide a high level of information about transactions while observing information security requirements.

Under the conditions of grain being a traditional commodity that meets all the requirements of exchange trading, it is necessary to take into account during transactions that its properties include homogeneity and divisibility, so it can be interchangeable, stored for a longtime, it is a mass commodity in the agro-industrial complex having a relatively permanent sale market (Uzun et al. 2017, Sandu et al. 2015).

According to world agencies, more than 20% of the total world agricultural trade involve grain products. Therefore, akey condition for its successful implementation is compliance with the requirements of enterprises' economic independence limiting the state intervention in the production, economic and commercial activities of the grain market entities on the issues of the production process, organization of exchange, consumption and distribution of grain.

Free pricing, unlimited competition among the sellers and buyers, and the presence of clear laws and regulations aimed at regulating the activities of grain exchanges can also contribute to the achievement of these goals.

Since the grain exchange trade is actually a modern element of the grain subcomplexeffective functioning, the Republic of Kazakhstan should constantly improve the legislative documents regulating the activities of grain commodity exchanges, create bodies of state and public control over their current activities, distribution system and rules for using the exchange information, and solve other relevant organizational issues. Due to the fact that any advanced exchange legislation becomes obsolete and unable to take into account the necessary specificity of the exchange organization over time, it is necessary to introduce systemic administrative and economic control with direct participation of representatives of state authorities and organizations manufacturing and buying grain. The need to create such a structure arises acutely in the initial period of the commodity exchange formation and functioning without losing its relevance even with thedevelopment of market competition.

The accumulated experience of the domestic grain market shows that the functioning efficiency of most wholesale intermediaries providing services to both buyers and manufacturers of various grain types has increased over the past few years. At the same time, the range of basic services provided by the wholesale intermediaries to the buyers of grain is gradually expanding including a number of traditional measures, such as demand assessment, operations to assist in organizing the grain procurement process, registration and transferring of ownershipfor marketable grain and its delivery, performing storage operations. In addition, at present, the wholesale intermediaries assist the grain producers in carrying out a number of activities aimed at the reduction of the labor costs in the grain selling process and provision of cash for the production and storage processes by collecting and providing a wide range of information.

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The main factors for the emergence and development of wholesale intermediation in the sale of grain are, in our opinion, centralization and specialization of its production and consumption reflected in the geographical concentration of many potential sellers (direct producers of grain) in the same regions under the corresponding demand for this product from its potential buyers.

Therefore, there is an objective need in the grain market for the emergence of specialized organizations (wholesale intermediaries), whose activities significantly increase the efficiency of product distribution. The wholesalers not only allow the consumers of their services to eliminate the need for organizationally complex business processes; they help the buyers withthe search for sources of salable grain and its producers with establishing contacts and checking the solvency of numerous buyers, forming consignments in accordance with the grain quality indicators and transporting it. Their work really contributes to the procedure of sale and purchase at the lowest cost due to the acceleration of commodity turnover process creating additional conditions for the growth of the grain subcomplex functioning efficiency in the agro-industrial complex of Kazakhstan.

Under these conditions, the grain market balance can be achieved by establishment of an equilibrium ratio between the volumes of grain production and processing, and, accordingly, the required production resources under the conditions of existing effective demand. Today, the participants in the sectoral market have no doubt about the important role of ensuring the marketing service system effectiveness, processes of studying the deformation of conjuncture in the grain market, development of an optimal assortment, organization of product movement and sales, promotion of grain selling, coordination of the participants, and their information and advertising support.

Another important aspect of the government policy under the constant deformation and development of socio-economic and financial relations between the grain producers and receiving enterprises should be presentation of new, higher requirements for their information support (Proshchalykina et al. 2019). Information about the grain market conjuncture must comply with the principles of reliability, timeliness and accessibility for all its users. In particular, we should talk about the methodology of building and improving the accounting, methods for collecting and processing statistical information on grain and its products, analytical tools and multi-variant forecasting of the market conditions, as well as organizational and technical support for information sharing.

According to the results of the study, construction of regional grain balances reflecting the indicators of the grain movement presence and intensity in a particular territory for a strictly defined period is recommended as an effective information basis for implementation of the state regulation for the socio-economic relations between the grain producers and receiving enterprises. These balances provide an opportunity not only to identify trends in the territorial distribution of grain stocks, but also to make a more reliable assessment of the potential for their replenishment, follow the trends in the formation of sectoral and inter-sectoral grain flows, promptly perform the work on regulation of the grain flows between the producing and consuming regions of the Republic of Kazakhstan.

The relevance of the above-mentioned works is increasing due to the fact that there are trends of clear deterioration in the performance of accounting for the presence and movement of grain over the past period, which causes conflicting estimates of the available grain resources in the context of individual regions and the republic as a whole creating the basis for the development of shadow trade, shadow economy and, as a result, corruption. In order to eliminate these negative trends under the current positive changes in the state grain policy of foreign trade liberalization, expansion oforganizational and legal management forms diversity in the field of grain production, emergence of a larger number of trading and intermediary structures, new effective approaches to the grain balance establishment are needed.

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According to scientists and practitioners including the authors of this paper, today it is necessary to account the movement not only of the grain as a whole, but also its particular types. Transition to the organization ofgrain movement accounting from the calendar year period to the agricultural annual one with a detailed definition of the grain market economic entities and unification of indicators, as well as their accounting and reporting items for the entire process chain (starting from its producers and ending with the consumers) isalso required. The information obtained can be taken into account by the users when preparing the grain forecast balance for the short, medium and long term.

Another mandatory requirement is the need to supplement the natural indicators of the grain balances with information on its cost including the levels of world and domestic market prices, production costs, tariffs for transportation and storage of grain. It is necessary to ensure equal rights of all business entities in the industry market to receive reliable information.

Therefore, it is necessary to expand the range of information published in newspapers instead of limited individual data on the sales volumes and price levels for certain types of grain in particular regions; as practice has shown, the latter can be useful majorly for the activities of trade and mediatory structures.

Collecting, analyzing and sharing the necessary information can be performed by information and analytical centers, which we recommend to create at research institutes, demand studying laboratories and computer centers. (Bogomolova? 2017)Carrying out functional diversification, the listed structures can expand the range of their activities through the additional collection and processing of primary information about the existing actors of the grain market (volumes and quality of marketable products, availability of containers for grain storage, price levels and tariffs, etc.), existing and possible changes in the conjuncture ofparticular regional, national and global markets in terms of specific types of grain both in the current year and in the planned periods.

Working in the field of providing this information to customers, the information centers will be able to promote multidimensional development of effective horizontal relations between the producers and consumers of the industry products allowing the latter to reduce the risks when developing competent tactics of behavior in the grain market. In addition, the information and analytical centers able to provide intermediary commercial services when organizing trade transactions for the purchase and sale of grain will have real chances to increase their competitiveness and achieve financial sustainability.

As a possible multiplicative effect of the increasing information support for the grain market development, we should note asignificant potential growth in demand for marketing, leasing, consulting and other types of services, which is due to steady trends towards expansion and complication of the grain sales channels, emergence of various forms and formation of extensive links between the industries and enterprises (Alimkulova 2018; Razminienė, Tvaronavičienė 2018; Žižka et al. 2018).

We believe that in addition to state statistical agencies, this function can also be included in the duties of the information centers, dispatcher services, traffic control centers and other existing centralized, regional, intersectoral and highly specialized organizations of state and commercial ownership forms. At the same time, within the grain policy framework, the state should promote the creation of conditions for their formation, development and technical equipment.

The analysis made has confirmed that under the conditions of Kazakhstan grain market’s multidimensional nature, the role of tools creation for advertising the production and sales activities has significantly increased. The need to use them is caused not so much by the significant distance between particular grain producers and consumers, but by the choice of simultaneously existing alternative conditions, forms and distribution channels for grain and its products, as well as dynamism of market changes in the industry.

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Despite the fact that the modern grain market of Kazakhstan was formed under the conditions of state's role weakening in the transition of agriculture and enterprises of agro-industrial processing complex to market relations, stability and continuity of providing all regionsand districts of the republic with grain, flour and bread should be noted as an obvious key achievement of the state policy in the field of market transformations. Today, the range of bread, bakery, pasta and flour confectionery products continues to expand and improve in accordance with the requirements of the country's food independence.

However, there are some actual problems that need to be solved. In particular, a significant reduction in the number of agricultural livestock in the country resulted in a decrease in demand for feed grain. Multidimensional pricing mechanisms have not been fully developed, and this often does not allow effectively regulating and maintainingthe prices for grain and its products. The underdeveloped infrastructure of the grain market with the focus on its individual constituent parts does not allow forming a single effective economic system.

At the same time, the government has developed a correct idea about the formation of mutually beneficial economic relations between the grain producers and receiving enterprises allowing to ensure the stability of relationship between the grain producers and consumers to increase the grain market efficiency and promote its operational advancement, complete preservation of the quantitative and qualitative indicators and more rational use. Among the main elements of the effective infrastructure formation, we should emphasize the renewal of material and technical base for organizations engaged in the storage, processing and transportation of grain; improvement of the trading and procurement system engaged in the purchase and sale of grain; regulation of banking and insurance organizations providing the stability of financial activities by the economic entities of the grain market.

Conclusions. Summing up the analysis made, we conclude that the lack of government's attention to the development of economic relations between the grain producers and receiving enterprises at the stage of building the market relations resulted in a number of negative consequences in the industry market of the Republic of Kazakhstan. Violation of interbranch and intrabranch proportions, increase in the time needed to complete one operational trade cycle, substantial losses and inefficient use of grain contributed to an increase in material costs, decrease in competitiveness and slowdown in the development of the country's grain farming.

Under these conditions, the multifunctionality of the state policy and instruments of authorities' management influence on the further formation and development of production and market infrastructure under the deformation of the world market environment should be primarily directed at the formation of its missing elements. Despite the debates on the possibility of foreign experience direct adaptation, it is recommended to pay closer attention to the need for equal access to the infrastructure services for all market structures including ones ensuring storage and sales of marketable grain and performing marketing, information collection and processing functions under simultaneouscompliance with the requirements of their economic interests' parity. Practical implementation of the developed recommendations can have a positive synergy and affect the growth of the Republic of Kazakhstan's grain and grain products competitiveness in the global industry market andconstant process of economic globalization.

References

Agricultural Outlook. 2016 – 2025. OECD. FAO: 136 p.

Alimkulova, E.S. 2018. Cluster development of agriculture as a factor of food security. *The Agricultural Market Issues*, 3, 173–179.

Altukhov A. I. 2014. Development of grain products subcomplex of Russia. Monograph. Publishing, Kuban, ADWI, 662 p.

Altukhov, A.I., Drokin, V.V., Zhuravlyov, A.S. 2015. Security and import substitution: major strategic objectives of contemporary agricultural policy. *R-Economy*, 3: 487- 494. https://doi.org/10.25826/recon.2015.3.012

Bogomolova, I.P, Shatokhina, N.M, Bogomolov, A.V., Strypchikh, E.S., Plekanova, E.V. 2017. Managing Adaptive Development of the Russian Food Industry. *International Journal of Applied Business and Economic Research*. Serials Publications Pvt. Ltd. 15(13). 161-170.

Bogomolova I.P., N.V. Shatokhina, A.V. Bogomolov, E.S. Stryapchikh, I.V. Plekanova. 2016. Improvement of the Resource Potential Management in Socially Important Enterprises of Agricultural Sector. *Journal of Engineering and Applied Sciences*, 11(6), 1235-1242 https://doi.org/10.3923/jeasci.2016.1235.1242

Bykov, E.G. 2018. State and ways of improving the quality of wheat crops in the leading grain powers of the post-Soviet space. *Economy, labor, management in agriculture.* 4(40), 44-50.

Charykova, O.G., Latynin, D.S. 2015. Development of grain market infrastructure is an important condition for the implementation of Russia's export potential. *Modern economy: problems and solutions* 4 (64): 138-144. https://doi.org/10.17308/meps.2015.4/1229

Economic indicators of the farm sector. 1986, VSDA. p. 81-94

Food and Agriculture Organization of the United Nations. FA Opubli-cations, Rome, Italy, 2008.

Gallagher, T.J. 2000. Financial management: principles and practice. T.J. Gallagher, J.D. Andrew, Jr. 2nd ed. Prentice Hall, Inc. Upper Saddle River, New Jersey 07458:.537

Mizanbekova S.K., Bogomolova I.P., Bogomolov A.V. 2017. Innovation technologies as a factor for increasing the quality of baking industry goods. *Food Processing: Techniques and Technology*, 45(2), 142-148. https://doi.org/10.21179/2074-9414-2017-2-142-148

Mizanbekova, S.K., Bogomolova, I.P., Pechenaya, L.T. 2015. Innovative processes in the elevator industry of Kazakhstan and Russia. *Bulletin of NAS RK. Series of Agrarian Sciences*, 3, 140–147.

Mizanbekova, SK., Kalykova, B.B., Mizanbekov, I.T. 2018. Issues of the Grain Subcomplex Sustainable Development in Kazakhstan. *The Agricultural Market Issue*s, 2, 139-147.

Krylatykh, E.N., Strokov S.N. 2012. Experience in forecasting Russia's agri-food markets using the Aglink-Cosimo model. *International Agricultural Journal*, 4, 3-6.

Proshchalykina, A., Kyryliuk, Y., Kyryliuk, I. 2019. Prerequisites for the development and prospects of organic agricultural products mark. *Entrepreneurship and Sustainability Issues*, 6(3), 1307-1317. https://doi.org/doi.org/10.9770-/jesi.2019.6.3(18)

Sandu, I., Demishkevich, G., Chepik, D. 2015. Formation of the agrarian innovation policy. *J. AIC: Economics, Management*, 10, 44-48.

Sedik, D., Lerman, Z., Uzun, V. 2013. Agricultural Policy in Russia and WTO Accession. *Post Soviet Affairs*, 29(6) https://doi.org/10.1080/1060586X.2013.817160

Sidorenko O.V. 2015.Conceptual approach to the assessment of grain products subcomplex development in the open economy. *Agricultural Russia*, 1, 35 -38. https://doi.org/10.15217/48484

Taipov, T. 2018. Public support models of agricultural production in the EAEU countries. *Bulletin of the Karaganda University. Economy Series*, 2(90), 91 -98. http://rep.ksu.kz/handle/data/3869

Tireuov, K., S., Mizanbekova, B., Kalykova, G., Nurmanbekova. 2018. Towards food security and sustainable development through enhancing efficiency of grain industry. *Entrepreneurship and Sustainability Issues* 6(1): 446- 455. http://doi.org/10.9770/jesi.2018.6.1(27)

Razminienė, K., Tvaronavičienė, M. 2018. Detecting the linkages between clusters and circular economy. *Terra Economicus*, 16(4):50-65 https://doi.org/10.23683/2073-6606-2018-16-4-50-65

UN statistical database on trade in goods. https://Comtrade.un.org

Ushachev, I.G., Maslova, V.V., Chekalin, V.S. 2018. State support of agriculture in Russia: problems, ways of their solution. *Agroindustrial complex: Economics, management*, 3, 4-12. https://doi.org/10.18619/2072-9146-2019-2-3-8

Ushachev, I.A., Serkov, V., Maslova, V., Chekalin, A. 2017. ModernTrends and Look into the Future of the Russian Agro-Industrial Complex. *AIC: Economics, Management*, 3, 4-13.

Uzun, V., Lerman, Z. 2017. Outcomes jf agrarian reform in Russia. Keyzer, M., Merbis, M. (Eds).The Eurasian Wheat Belt and Food Security: Global and Regional Aspects. Seville: IPTS JRC p. 81-101

Žižka, M., Hovorková, V.; Pelloneová, N.; Štichhauerová, E. 2018. The effect of clusters on the innovation performance of enterprises: traditional vs new industries. *Entrepreneurship and Sustainability Issues*, 5(4), 780-794. http://doi.org/10.9770/jesi.2018.5.4(6)

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PREVENTING REGIONAL SOCIAL AND ENVIRONMENTAL CONFLICTS DURING OIL PIPELINE CONSTRUCTION PROJECTS

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Abstract. The problem of constructing field pipelines from the oilfield to the main pipeline or an oil loading terminal is considered. Cost estimates for routes of field pipelines take into account the pipeline construction and operation costs, environmental accident pollution risks, compensations to local residents, and costs of compensatory projects to accommodate local interests. This helps to ensure that conflicts are avoided in the process of economic development of northern territories. A specific feature in evaluating the total costs is the use of fuzzy numbers. The authors' adaptation of the Shimbel-Otterman method is substantiated for choosing an optimum field pipeline route, whose adaptation involves the application of fuzzy cost estimates for individual segment options of the pipeline route. The proposed approach to the analysis of the resulting solution relies on the use of a confidence level function, which helps the decision-maker to identify the most viable field pipeline route option. A detailed algorithm for solving the problem is laid out, with a numerical example to prove the operational quality of the proposed method.

Keywords: pollution damage; environment; conflict; compensations to population; field pipeline; route; fuzzy estimate; confidence level; minimization of total costs

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JEL Classifications: Q01**, Q**32

1. Introduction

Oil production in underdeveloped areas of the world, including such areas in Russia, inevitably causes adverse environmental impact, destruction of animal migration routes, deterioration of hunting lands, and depletion of fish populations in rivers (Guri et al. 2013). Alongside oil production, a serious negative contributor is oil transportation via field pipelines from the field being developed to a main pipeline or a sea or river terminal. Route planning options for building such pipelines should take into account the following factors: capital expenditure in construction; operating expenses; economic estimates of potential environmental damage caused

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by accidents on the pipeline (Nriagu et al. 2016); compensations to local population in the area of pipeline construction to eliminate socio-environmental conflicts; implementation costs of compensatory project to accommodate local interests (O'Faircheallaigh 2009; Shvetsova et al. 2018). As long as several options may be available for planning solutions in field pipeline construction, the choice of the best option should include a solution of the problem of minimizing the total project costs of oil transportation, i.e., the problem of identifying the optimum pipeline route.

2. Problem setting and analysis of approaches to the solution

To identify an optimum construction option for a field pipeline, a pipeline diagram should be charted, including options for individual segments (ij), linked into a single network G, i.e. $(ij) \in G$. Network G includes all laying options of the planned field pipeline. The optimum field pipeline route will be found in this proposed network, taking into account the lowest cumulative costs. The amount of investment $D_{(ij)}$ and annual operating costs $S_{(ij)}$ are determined based on feasibility studies for each of the segments $(ij) \in G$ individually.

The annual economic estimate for accident-related damage $U_{(ij)}$ is based on an analysis of natural risks, such as seismic activity in the area measured by the MSK-64 scale. Calculations also include technical factors associated with the external corrosion of the piping, mechanical damage, defects of construction and installation, as well as defects of piping. Apart from that, assessments of potential damage from accidents on a particular segment of the pipeline should take into account several criteria: occurrence of Specially Protected Natural Reservation areas of either federal or regional significance within the corridor of the pipeline; crossing into the optimal habitat of rare, "Red Book" or economically valuable species of plants and animals; crossing into the group I forestry; crossing rivers designated as the first fishery category and significant spawning routes; proportion of the route segments affecting the least disturbed ecosystems outside specially protected areas, which represent considerable importance for preserving biodiversity (Porfiryev, Tulupov 2017).

The aggregate assessment of the annual accident risk on the pipeline segment (ij) is calculated according to the equation:

$$R_{(ij)} = U_{(ij)} \times l \times L_{(ij)}, \quad (1)$$

$U_{(ij)}$ – economic estimate of environmental pollution damage taking into account the specifics of the area for segment $(ij) \in G$ of the field pipeline, thousand euro;
l – accident risk on the pipelines in the region per 1 km per year, fractions;
$L_{(ij)}$ – length of segment $(ij) \in G$ of the planned field pipeline, km.

As long as the economic estimate of environmental pollution damage and the relative accident rate (Fetisov et al. 2016) are defined as intervals characterised by a min and a max and an anticipated value (av), then the value of risk according to equation (1) is determined by the three components: $\hat{R}_{(ij)} = (R_{(ij)}^{\min}; R_{(ij)}^{av}; R_{(ij)}^{\max})$. Such presentation of the above indicators corresponds to fuzzy (triangular) numbers (Uzhga-Rebrov, Kuleshova 2015). Each of the three components of the number has a respective confidence level $\mu(R)$, wherein $\mu(R^{\min}) = 0; \mu(R^{av}) = 1; \mu(R^{\max}) = 0$. Fuzzy numbers can be represented in a chart, e.g. for number $\hat{R} = (4;8;10)$ the resulting presentation is as follows in Fig. 1.

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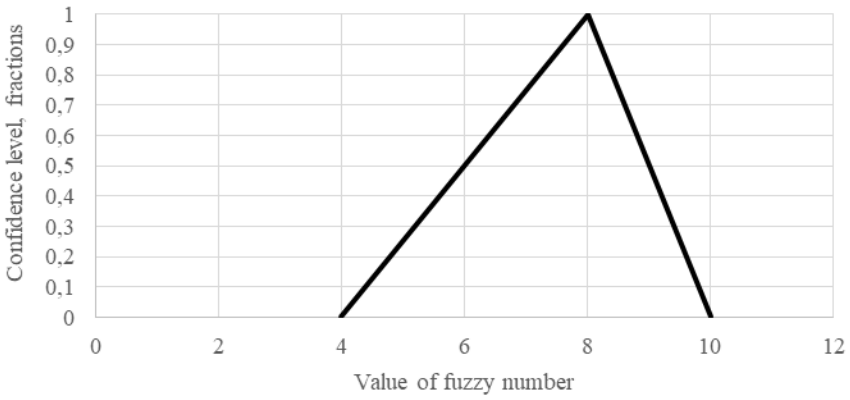

Fig.1. Graphic representation of triangular number $\hat{R} = (4;8;10)$

Sociocultural risks (Tulupov 2017) represent the negative effects of the pipeline for local social and cultural values during the construction and operation of the pipeline. The assessment of sociocultural risks should take into account the following aspects: line passage in populated indigenous ancestral settlement areas; crossing into the areas of traditional natural resource exploitation and traditional local economic activities; pipeline effects for traditional lifestyles; pipeline construction effects for cultural and religious heritage sites and public health. The above risks result in the payment of compensations linked to lost benefits and damage caused to locals and spending by the oil producer on projects to eliminate conflict with the population. Cost estimates associated with compensation payments and such projects for year *t* are determined for each segment $(ij) \in G$ of the planned field pipeline. We shall designate these costs $\hat{P}_{t(ij)} = (P^{\min}_{t(ij)}; P^{av}_{t(ij)}; P^{\max}_{t(ij)})$.

Route optimization for a field pipeline from the production site to the main pipeline is supposed to minimize capital and operating costs, mitigate the above-mentioned risks and bring down compensation payments. A clear optimization criterion including the above components should be developed and an algorithm has to be worked out to identify an optimum pipeline passage route in the described outlook

3. Developed problem-solving approach

The selection of an optimum pipeline passage route is operated using an oriented graph *G* without reverse arcs. Each arc (ij) corresponds to a pipeline segment followed by alternative next segments or the final pipeline destination point. As long as each of the pipeline segments (ij) is associated with certain levels of construction and operating costs, compensation payments to the population and damages in case of accidents, these costs should be considered dynamically for the period of construction and operation of the pipeline. For that, the annual figures should be added up taking into account the time factor, i.e., using the discounting (present value) factor (Novoselova, Novoselov 2016). As the total costs correspond to the pipeline segment (ij), we shall designate them as $E_{(ij)}$.

Total costs for arc (ij) are calculated according to the equation as a triangular number:

$$\hat{E}_{(ij)} = \sum_{t=T_1}^{T_2} (S_{t(ij)} + \hat{R}_{t(ij)})(1+r)^{1-t} + \sum_{t=1}^{T_0} D_{t(ij)}(1+r)^{1-t} + \sum_{t=1}^{T_1} \hat{P}_{t(ij)}(1+r)^{1-t} \qquad (2)$$

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where $S_{t(ij)}$ is operating costs for pipeline segment $(ij) \in G$ for year *t*;

$\hat{R}_{t(ij)}$ – fuzzy estimate of the risk of environmental pollution damage in case of accidents caused by technology or natural factors during the operation of pipeline segment $(ij) \in G$ for year *t*;

$D_{t(ij)}$ – investment in the construction of pipeline segment $(ij) \in G$ for year *t*;

$\hat{P}_{t(ij)}$ – fuzzy estimate of compensation payments to the population and spending on conflict elimination projects related to the construction and operation of pipeline segment $(ij) \in G$ for year *t*;

t – current year;

$(1,2...T_0)$ – construction period of pipeline segment (ij);

$(T_0+1,...T_1)$ – operation period of pipeline segment (ij).

For identifying a construction solution minimizing total costs for a field pipeline $L=\{1,...n\}$ linking the oil field (the start event in the graph of options of field pipeline construction with the corresponding value 1) to the final destination – a main pipeline or a loading terminal (the finish event in the graph of options of field pipeline construction with the corresponding value *n*), one of the following methods (Akhtar et al. 2016) is proposed: the Floyd-Warshall algorithm; the Bellman-Ford algorithm; Dijkstra's algorithm; Johnson's algorithm; Shimbel's algorithm. The application of the latter method is based on the adjacency matrix of the analysed pipeline passage graph. A distinctive feature of the Shimbel's algorithm is the step-by-step calculation of total cost estimates for pipeline fragments comprising firstly two segments, then three segments and more. This method can be conveniently combined with Otterman's routing method (Schrijver 2012) to eventually arrive at an optimum choice corresponding to the lowest-cost option identified by Shimbel's method. Importantly, the amount of computation under the method is less dependent on the complexity of the graph of alternative routes *G*. Moreover, the Shimbel-Otterman method is usable for the software application. This warranted the selection of the Shimbel-Otterman method for the set problem.

While the total cost estimates for each segment of the pipeline route in the discussed problem calculated according to (2) are represented as fuzzy numbers $\hat{E}_{(ij)}=(E_{(ij)}^{\min};E_{(ij)}^{av};E_{(ij)}^{\max})$, the application of the Shimbel-Otterman method $L=\{1,...n\}$ for routing problem with fuzzy data (Ahmed, Kilic 2019) required an adjustment.

The proposed adapted algorithm renders a step-by-step selection of an optimum pipeline route for the minimum $E_{(ij)}^{\min}$, anticipated $E_{(ij)}^{av}$ and maximum $E_{(ij)}^{\max}$ values of the total costs for each segment of the route. For convenience, we shall assume μ equals “min” or “av” or “max”, i.e., calculations are made for $E_{(ij)}^{\mu}$. The output is three optimum routes with corresponding construction and operation costs and compensations to the population $F^{\mu}:F^{\min},F^{av},F^{\max}$. The resulting fuzzy estimate of costs $F=(F^{\min};F^{av};F^{\max})$ is further supplied with a corresponding calculation of the level of confidence in the attainment of the respective result, which helps to arrive at a conclusive pipeline route choice.

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4. Detailed problem-solving algorithm

The algorithm consists of the following steps.

Step 1. Calculations of an estimate of total costs for μ.

Step 2. Adjacency matrix A is built, showing total cost estimates $E^{\mu}_{(ij)}$ for the existing arcs, where the respective values are predetermined according to (1):

$$A_{ij} = \begin{cases} E^{\mu}_{(ij)'} & \forall (ij) \in G \\ 0, & in\ the\ contrary\ case \end{cases} \quad (4)$$

Step 3. Assigning $B=A$; $p=1$

Step 4. Calculation of the matrix C^p of the sums of weights for the nodes of all paths containing two arcs according to the rules (3). Elements of matrix C are calculated according to the equation:

$$C^p_{ij} = \begin{cases} \min\limits_{k=1,2,...n} \{a_{kj} + b_{ik}\}, & for\ a_{kj} > 0\ and\ b_{ik} > 0 \\ 0, & if\ all\ a_{kj}\ and\ b_{ik} = 0 \end{cases} \quad (5)$$

Step 5. Building the routing matrix T^p showing the preceding node for each node along the way represented in the matrix columns according to the rule:

$$T^p_{ij} = \begin{cases} k^* based\ on \min\limits_{k=1,2,...n} \{C^p_{ij}\}, where\ there\ exists\ C^p_{ij} > 0 \\ 0, \quad if\ all\ C^p_{ij} = 0 \end{cases} \quad (6)$$

Step 6. Test: is the matrix C^p comprising only zeros? If yes, go to step 8, otherwise, step 7.

Step 7. Assigning $B=A$; $p = p+1$; go to step 3.

Step 8. Determining the minimum weight for the best pipeline construction option:

$$F^{\mu} = \min_{l=1,2,...p} \{C^p_{1n}\} \quad (7)$$

Step 9. Building the optimum route $L^* = \{1,...n\}$ based on the first lines of the routing matrix C^l, l = 1,2,..p*. End of calculation for the considered fuzzy estimate of the total costs of the pipeline by the segments: $F = (F^{\min}; F^{av}; F^{\max})$.

The described algorithm is repeated for each of the border values of the fuzzy estimate of the total costs of pipeline construction: Thus, optimum routing options are determined according to the minimum total cost criterion (2).
Different methods can be used to analyse the fuzzy result arrived at, e.g. see (Mazarbhuiya 2016). A confidence function is further built based on the results achieved for the optimum total cost values:

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Step 1. Calculation of the interim value α given the variation of g from $F^{\min}$ to $F^{\max}$ with an interval $\Delta = \frac{F^{\max} - F^{\min}}{N}$:

$$\alpha = \begin{cases} \frac{F^{\max} - g}{F^{\max} - F^{av}}, & F^{av} \le G \le F^{\max} \\ \frac{g - F^{\min}}{F^{av} - F^{\min}}, & F^{\min} \le G < F^{av} \end{cases} \quad (8)$$

Step 2. Calculation of the interim value β given the variation of g from $F^{\min}$ to $F^{\max}$ with a preset a priori interval Δ:

$$R = \frac{F^{\max} - g}{F^{\max} - F^{\min}}, \quad F^{\min} \le g < F^{\max} \quad (9)$$

Step 3. Calculation of the values of the confidence function *k(g)* given the variation of G from $F^{\min}$ to $F^{\max}$ with a preset a priori interval Δ:

$$k(G) = \begin{cases} \beta\left(1 + \frac{1-\alpha}{\alpha}\ln(1-\alpha)\right), & F^{\min} \le g < F^{av} \\ 1 - (1-\beta)\left(1 + \frac{1-\alpha}{\alpha}\ln(1-\alpha)\right), & F^{av} \le g < F^{\max} \\ 1, & g = F^{\max} \end{cases} \quad (10)$$

Each segment of the confidence function has a corresponding optimum pipeline option with minimum total costs, which means a route can be selected for the required upper limit of the confidence level.

5. Example of charting an optimum route of field pipeline

The segments for charting an optimum pipeline route and the corresponding economic parameters are laid out in Table 1.

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Table 1. The source data for the formation of the optimal variant of the oil pipeline

Route segment option (i,j)	Discounted values, million euro				
	Investment	Current costs	Fuzzy estimate of accident risk	Fuzzy estimates for compensation payments and costs of compensatory projects	Fuzzy total estimate for a route segment
(1, 2)	1.2	0.7	(0,8;1,2;1,4)	(0,6;0,7;0,8)	(3,3;3,8;4,1)
(1, 3)	1.4	0.6	(0,4;0,8;0,9)	(0,2;0,3;0,5)	(2,6;3,1;3,4)
(2, 3)	1.0	0.5	(1,2;1,4;1,5)	(0,5;0,6;0,8)	(3,2;3,5;3,8)
(2, 4)	0.8	0.5	(0,5;0,6;0,8)	(0,8;0,9;1,1)	(2,6;2,8;3,2)
(3, 6)	6.7	1.6	(0,7;0,9;1,1)	(0,3;0,5;0,7)	(9,3;10,7;11,7)
(4,5)	0.7	0.5	(0,8;0,9;1,2)	(0,5;0,8;0,9)	(2,5;2,9;3,3)
(4, 6)	2.1	1.8	(0,6;0,8;0,9)	(0,2;0,5;0,7)	(4,7;5,2;5,5)
(5, 6)	1.2	0.4	(0,4;0,7;0,9)	(0,1;0,3;0,6)	(2,1;3,7;4,2)

Based on individual segments, a graph of alternative routes running from node i=1 corresponding to the oil field to node j=6 representing the main pipeline can be easily built (Fig. 2). The arcs are marked with the corresponding fuzzy estimates of the total costs of construction and operation including damages and compensation payments to the population.

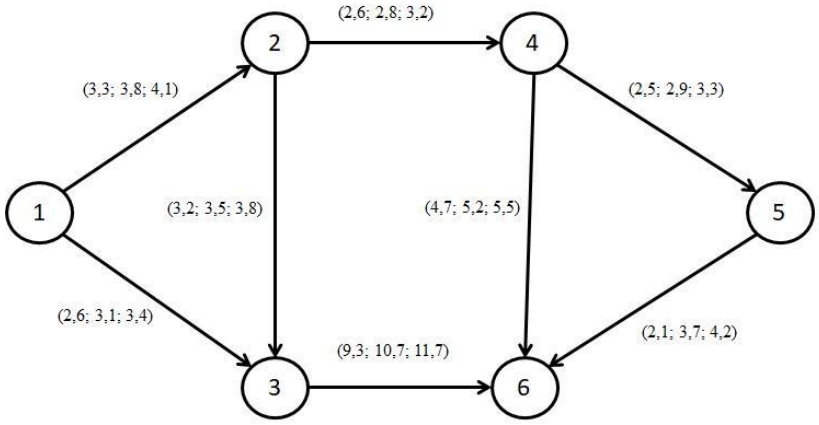

Fig.2. Route options for field pipeline

Consider the route options represented by the adjacency matrix (Table 2) showing the minimum total costs of implementation of field pipeline segments.

Table 2. Inputs for selecting optimum construction option based on minimum total costs

	Total minimum costs for the pipeline segment running from *i* to *j*, million euro					
i	1	2	3	4	5	6
1	0	3.3	2.6	0	0	0
2	0	0	3.2	2.6	0	0
3	0	0	0	0	0	9.3
4	0	0	0	0	2.5	4.7
5	0	0	0	0	0	2.1
6	0	0	0	0	0	0

Elements of Table 3 are calculated according to equation (5). E.g. to calculate the elements of the matrix (1, 3), refer to line 1 and column 3 of the input data (Table 2):

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$$C_{1,3}^{1} = \min\{0+2,6;3,3+3,2;0+0;0+0;0+0;0+0\} = 6,5 \quad (7)$$

All other values in Table 3 are calculated accordingly.

Table 4 shows the numbers of the nodes shaping the last fragment of the route. E.g., Table 3 renders routes consisting of two segments. The two-segment minimum route from node (i=1) to node i=3 runs through node 2. This can be established by selecting a minimum nonzero element according to equation (6). Thus, "2" is indicated at the intersection of line 1 and column 3 in the routing matrix.

Table 3. Optimum pipeline fragment options, two segment solutions

i	Total costs on paths to nodes j, million euro					
	1	2	3	4	5	6
1	0.00	0.00	6.50	5.90	0.00	11.90
2	0.00	0.00	0.00	0.00	5.10	7.30
3	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	4.60
5	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00

Table 4. Routing of identified pipeline fragments, two segments

i	Path to node j					
	1	2	3	4	5	6
1	0	0	2	2	0	3
2	0	0	0	0	4	4
3	0	0	0	0	0	0
4	0	0	0	0	0	5
5	0	0	0	0	0	0
6	0	0	0	0	0	0

Table 4 shows the numbers of the nodes shaping the last fragment of the route. E.g., Table 3 renders routes consisting of two segments. The two-segment minimum route from node (i=1) to node i=3 runs through node 2. This is established by selecting a minimum nonzero element according to equation (6). Thus, "2" is indicated at the intersection of line 1 and column 3 in the routing matrix.

In this problem, a route needs to be selected, running from the field (i=1) to the main pipeline (i=6). As can be seen from Table 3, there is such route consisting of two fragments and its total weight equals 11.9 million euro. According to Table 4, the route runs through nodes 1, 3 and 6, i.e. $L = \{1,3,6\}$.

Further calculation is warranted since the minimum number of fragments in the route does not guarantee a minimum total weight. Therefore, a new matrix is built further, showing minimum total weight estimates for all routes comprising three segments (Tables 5, 6).

Table 5. Optimum pipeline fragment options, three segments

i	Total costs on paths to nodes j, million euro					
	1	2	3	4	5	6
1	0.00	0.00	0.00	0.00	8.40	10.60
2	0.00	0.00	0.00	0.00	0.00	7.20
3	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00

Table 6. Routing of identified pipeline fragments, three segments

i	Path to node j					
	1	2	3	4	5	6
1	0	0	0	0	4	4
2	0	0	0	0	0	5
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0

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The number of the node with the lowest total weight is further established. For line 1 and column 6, the respective node is the fourth node, therefore, "4" is indicated at the intersection of line 1 and column 6.

Tables 7 and 8 are calculated similarly for routes comprising four pipeline fragments.

Table 7. Optimum pipeline fragment options, four segments

i	Total costs on paths to nodes *j*, million euro					
	1	2	3	4	5	6
1	0.00	0.00	0.00	0.00	0.00	10.50
2	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00

Table 8. Routing of identified pipeline fragments, four segments

i	Path to node *j*					
	1	2	3	4	5	6
1	0	0	0	0	0	5
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0

Further calculations produce zero matrices. Thus, the results identified in Tables 7, 8 are final.

The resulting options are further used to identify a route with minimum weight. Minimum value in Tables 3, 5, 7 is established in line 1 and column 6. The minimum value, which is 10.5 million euro, is found in Table 7, therefore, the optimum route consists of four arcs (pipeline segments). To establish the sequence of nodes in the route, refer to the routing matrix corresponding to the table that produced the minimum value, i.e., Table 8. The intersection of line 1 and column 6 has "5", therefore, node 6 is approached via node 5. Refer to the previous routing matrix (Table 6). The intersection of line 1 and column 4 has "4", therefore, the path to node 5 runs via node 4. The intersection of line 1 and column 4 in Table 4 has "2", therefore, route segment (2,4) is selected. There is no further routing matrix, thus, segment (1, 2) is selected. Therefore, the optimum oil pipeline choice runs along route L = {1–2–4–5–6}, which produces the optimum level of costs of 10.5 million euro based on the minimum total cost estimates for route segment options.

The described algorithm is further applied to produce an optimum route for the average (av) and maximum (max) values of the total cost estimates for pipeline segment options. Calculation results are laid out in Table 9.

Table 9. Results of selection of optimum pipeline route based on the components of fuzzy total cost estimates for segment options

Calculation approach based on the components of fuzzy estimates of costs for route segment options	Optimum route	Present value of total costs, million euro
1. Based on minimum estimates, $E_{(ij)}^{\min}$	L = {1–2–4–5–6}	10.5
2. Based on average estimates, $E_{(ij)}^{av}$	L = {1–2–4–6}	11.8
3. Based on maximum estimates, $E_{(ij)}^{\max}$	L = {1–2–4–6}	12.8

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The resulting estimates of total costs for optimum routes from the last column of Table 9 are the components of a fuzzy number, for which further analysis needs to be conducted based on rendering a confidence function. Assume the number of cases analysed at N=10. Then the interval of search is $\Delta = \frac{F^{\max} - F^{\min}}{N} = \frac{12.8 - 10.5}{10} = 2.33$ million euro. The identified interval is used to walk through the levels of total costs from the minimum to the maximum value (first column of Table 10). The remaining items in the table are determined according to (8-10).

Table 10. Calculation of data for building confidence function

g, million euro	Interim parameters		Confidence level estimate $k(g)$, proportions
	α	β	
10.50	0.00	0.00	0.00
10.73	0.18	0.10	0.01
10.96	0.35	0.20	0.04
11.19	0.53	0.30	0.10
11.42	0.71	0.40	0.20
11.65	0.88	0.50	0.36
11.88	0.92	0.60	0.69
12.11	0.69	0.70	0.86
12.34	0.46	0.80	0.94
12.57	0.23	0.90	0.99
12.80	0.00	1.00	1.00

Based on the confidence level assessment $k(g)$ laid out in the last column of Table 10, a chart of the confidence function is built (Fig. 3).

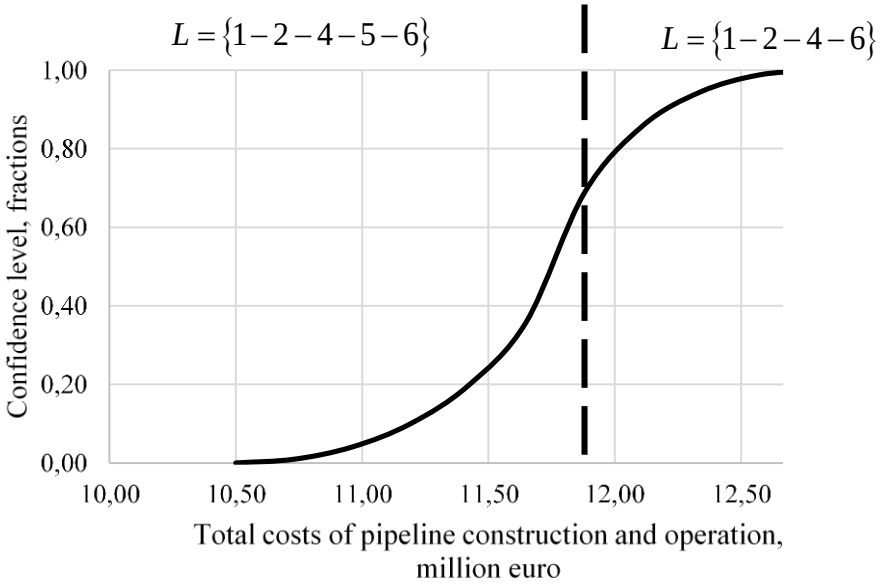

Fig.3. Confidence function charted for optimum pipeline routes

The dashed line in Fig. 3 runs through the average component of the fuzzy estimate of the present value of total costs, 11.8 million euro, with the corresponding confidence level of 0.67. Where confidence level is lower than 0.67, the route option L = {1–2–4–5–6} should be chosen, otherwise, option L = {1–2–4–6}.

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6. Results and discussion of the application of the method

This study was completed to advance the development of the basic methods of analysis and conflict resolution related to environmental issues addressed earlier (Novoselov et al. 2016). The probabilistic approach to estimating the environmental pollution damage as described in this paper is consistent with modern methods (Chhabra et al. 2018). Meanwhile, there appears an opportunity to arrive at a more accurate assessment of environmental pollution damage taking into account the time factor by application of the discounting (present value) technique. The time factor is also accommodated in assessing other economic indicators. Therefore, the total costs for individual segments and the optimum field pipeline route solution take into account the time factor.

It should be noted that the calculations are based on fuzzy estimates of cost levels reflecting the high uncertainty over the probabilistic damage (risk) linked to environmental pollution and costs related to compensatory projects and payments to local populations. Fuzzy estimates of damage have already been approached, e.g. see (Pislaru et al. 2013). This paper considerably extends the scope of application of fuzzy estimates to all costs related to the construction and operation of an oil pipeline.

The fundamentally new tool for making the conclusive choice of the field pipeline route is the approach proposed in the paper for calculating confidence levels for the variation range of the total costs between the minimum to the maximum value. The chart of the change in confidence levels represents not only total costs of pipeline construction and operation including environmental and compensatory spending but also the identified optimum routes.

The proposed approach was used for planning field pipelines in hydrocarbon production in the Arctic zone conditions.

Conclusions

The set problem of identifying an optimum pipeline route is different from the practical applications and known theoretical approaches used for similar problems in that the cost calculations operated take into account fuzzy estimates of environmental pollution damage and compensation payments to the local population in the region. The performed analysis of a wide range of approaches to pipeline route optimization helped to select the most practical method for software implementation and addressing middle- to large- dimension problems employing matrix operations, the Shimbel-Otterman method. The results of the conducted calculations prove the practical feasibility of the application of the described approach of this paper to address a wide range of problems concerning calculations of optimum pipeline routes to prevent conflicts with the local population.

References

Guri, A.; Guri, S.; Aliu, A.; Lubonja O. 2013. The Impact of Oil Development Activities on Environment and Sustainable evelopment in Fier Area, Albania. *Academic Journal of Interdisciplinary Studies* 2(9): 626-634. http://doi.org/10.5901/AJIS.2013.V2N9P626

Nriagu, J.; Udofia, E.A.; Ekong, I.; Ebuk, G. 2016. Health Risks Associated with Oil Pollution in the Niger Delta, Nigeria. *International Journal of Environmental Research and Public Health* 13(3): 346. http://doi.org/10.3390/ijerph13030346

O'Faircheallaigh, C. 2009. Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making. *Environmental Impact Assessment Review* 30(1): 19-27. http://doi.org/10.1016/j.eiar.2009.05.001

Porfiryev, B. N.; Tulupov, A.S. 2017. Environmental Hazard Assessment and Forecast of Economic Damage from Industrial Accidents. *Studies on Russian Economic Development* 6: 600-607. http://doi.org/10.1134/S1075700717060107

Fetisov, V.G.; Nikolaev, A.K.; Lykov, U.V. 2016. Prediction of oil loss as a result accident branched pipeline oil. *Slovak international scientific journal* 1(1): 73-82. http://sis-journal.com/wp-content/uploads/2016/12/Sis-journal_1.pdf

Uzhga-Rebrov, O.; Kuleshova, G. 2015. Operating with Fuzzy Probability Estimates in Decision Making Processes with Risk. *Information Technology and Management Science* 18: 102-114. http://doi.org/10.1515/itms-2015-0017

Tulupov, A.S. 2017. Compensation for environmental damage in the economy of mining. *Gornyi Zhurnal* 8: 61-65. http://doi.org/10.17580/gzh.2017.08.11

Novoselova, I. Y.; Novoselov, A. L. 2016. Estimation of Accumulated Environmental Damage: Methods and Experience. *Journal of Environmental Management and Tourism*, 4(16): 619-624. http://doi.org/10.14505/jemt.v7.4(16).08

Akhtar, T.; Mahmood Baig, M. 2016. New artistic approach for shortest path by using swarm intelligence. *Sci.Int.(Lahore)* 28(2): 1067-1070. http://www.sci-int.com/pdf/6787553671%20a%201067-1070%20Talha%20Shahid--PHY--REVIEWED--15-2-16.pdf

Schrijver, A. 2012. On the History of the Shortest Path Problem. *Documenta Mathematica* Extra Volume ISMP: 155–167. https://www.math.uni-bielefeld.de/documenta/vol-ismp/32_schrijver-alexander-sp.pdf

Shvetsova, O.A.; Rodionova, E.A.; Epstein, M. Z. 2018. Evaluation of investment projects under uncertainty: multi-criteria approach using interval data. *Entrepreneurship and Sustainability Issues*, 5(4): 914-928. http://doi.org/10.9770/jesi.2018.5.4(15)

Ahmed, F.; Kilic, K. 2019. Fuzzy Analytic Hierarchy Process: A performance analysis of various algorithms. *Fuzzy Sets and Systems*, 362: 110-128. http://doi.org/10.1016/j.fss.2018.08.009

Mazarbhuiya, F.A. 2016. Finding standard deviation of a fuzzy number. I*nternational Journal of Research – GRANTHAALAYAH* 4(1): 63-69. http://granthaalayah.com/Articles/Vol4Iss1/08_IJRG16_A01_11.pdf

Novoselov, A.; Potravny, I.; Novoselova, I.; Gassiy, V. 2016. Conflicts Management in Natural Resources Use and Environment Protection on the Regional Level. *Journal of Environmental Management and Tourism* 7(3): 407-415. http://doi.org/10.14505/jemt.v7.3(15).06

Chhabra, J.P.S.; Hasik, V.; Bilec, M.M.; Warn, G.P. 2018. Probabilistic Assessment of the Life-Cycle Environmental Performance and Functional Life of Buildings due to Seismic Events. *Journal of Architectural Engineering* 24(1). http://doi.org/10.1061/(ASCE)AE.1943-5568.0000284

Pislaru, M.; Trandabat, A.F.; Trandabat, D. 2013. Assessment of Corporate Environmental Performance Based on Fuzzy Approach. *APCBEE Procedia* 5: 368–372. http://doi.org/10.1016/j.apcbee.2013.05.063

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