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FOREWORD

to ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES, 2018
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Dear readers,

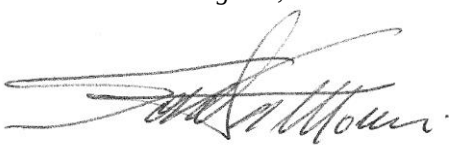
Between 2013 and 2017 the EU's AguaSociAL program was carried out, aimed at consolidating knowledge cooperation and sharing on water issues between Brazil and the European Union. It was conceived under the Seventh Framework Programme—FP7—and financed by the International Research Staff Exchange Scheme —IRSES Marie Curie Actions.

The project provides local training on water treatment techniques and technologies based on the social innovation approach. The principle of social innovation lays the foundations of the project, which in turn aims to enhance practical use of the research and to support the creation of new paradigms related to water resources management in the Brazilian Amazon. Pará and Amazonas states offered themselves as case studies, and were particularly interesting due to their abundance of natural resources and to the major challenges they face in terms of water treatment, as well as access to water as a common good.

The Department of Economics of Roma Tre University has led the project since 2013, coordinating between other partners, such as Leeds Beckett University (United Kingdom), Universitat Autònoma de Barcelona (Spain), Universidade Federal do Pará—UFPA (Belém, Pará, Brazil) and Universidade do Estado do Amazonas—UEA (Manaus, Amazonas, Brazil). In particular, AguaSociAL sought to investigate and support techniques and technologies conceived by both local communities and academic teams in order to improve access to and treatment of water, facilitating R&D activities and social innovations in the Amazon Region. Beyond water treatment, the project focused on the identification of technologies for re-use and recycling, together with the identification of potential sanitation services that communities would accept and own. This particular approach strengthened the link between scientific knowledge and local traditions (knowledge sharing), while supporting a learning process targeting sustainable development. A key step was to evaluate the social and economic impact of exploiting low-cost water treatment techniques and technologies, in order to address fair and adequate solutions. The active participation of local communities, not only seen as basic users but also as main interlocutors, was a key factor for success in estimating the social and economic impact of interventions. Nevertheless, up to this day the main actors needed for the correct implementation of "solutions" and the launch of a self-sustaining virtuous cycle at local and national level are the federal state (through majority ownership in energy and services enterprises) and the private sector. Training programs and multidisciplinary research have the scope to promote the elaboration of social innovations needed by the more exposed populations of the Amazonian region (acceptance technology). The project aims to involve vulnerable communities in specific key areas in the evaluation of their conditions and basic needs, drafting general guidelines that could support governance. European and Brazilian research institutions share knowledge and expertise as well as awareness on the importance of meeting the final goal of drinkable water for urban and rural communities in the Amazon.

Over the course of the project, thanks to Professor Manuela Tvaronavičienė, a collaboration has developed between the Entrepreneurship and Sustainability Center and AguaSociAL, thanks to which we are able to dedicate part of this issue to AguaSociAL project output papers. These have as their objectives: water, energy, and social innovation in Brazilian Amazon and wherever the concept of sustainability, so dear to the journal that hosts us, has declined not only in environmental terms but above all in social and economic terms.

With best regards,



Professor **Salvatore Monni**

Principal Investigator AguaSociAL *FP7-PEOPLE-2013-IRSES - Marie Curie Action "International ResearchStaff Exchange Scheme", Grant Agreement Number 612633*

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HYDROELECTRIC PROJECTS AND TERRITORIAL GOVERNANCE IN REGIONS OF THE STATE OF PARÁ, BRAZILIAN AMAZON*

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Abstract The public and private institutional dynamics in the process of developing territories impacted by large hydroelectric projects have faced challenges over time in different aspects. The challenge is not only how to build participatory governance at different levels, but how to promote democratic and responsible vertical conceptions among actors at each level, considering the sharing of irreversible socioeconomic impacts caused by this enterprises in the Amazon. The construction of new relations between ordinary people and institutions - government, companies, society - forces the constant search for the establishment of strategies to establish social relations for the construction of models of territorial governance still in initial experiences in the state of Pará. To identify impacts, conflicts and territorial governance in areas of major projects: what has literature shown of experiences in the Amazon?

Keywords: Brazil; Legal Amazon; Territorial Governance; Hydroelectric Projects

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1. Introduction

Since the 1950s, the Amazon has been the target of the planning of large projects for the energy sector, since it has more than 50% of Brazil's energy potential, according to Fearnside (2015). In the State of Pará two major projects stand out: the Tucuruí Hydroelectric Power Plant, in operation in 1984 and the Belo Monte Hydroelectric Power Plant, in operation in 2016.

Projects in the energy sector are part of a national development strategy focused on economic growth, however it has a history of poor relation with impacted communities, since many authors and documentaries report the adverse impacts caused by these enterprises, detached from territorial development. National strategy has revealed itself to be of an excluding nature, rendering the development process extremely unbalanced and adverse for the Amazon (Iorio et al. 2018; Izuymov et al., 2017).

Appropriation of water by public and private enterprises in order to produce energy may threaten the process of universalization of access to water. Furthermore, it can damage local economies (e.g. through the interruption of water flows that could have otherwise been used for transportation and commerce) with huge negative impacts being suffered mostly by the local communities (Monni et al., 2018; Valuiskov, 2016).

The relationship between the implementation of large investment projects, especially large hydroelectric projects and local populations, has become a recurring feature of the debates on regional and local development in the Amazon (Vainer and Araújo, 1992).

It should be noted that, in peripheral regions, the implementation of large investment projects profoundly transform land use and occupation, the way of life of the regional populations, the demographic contribution and the settlement system and the network of cities, breaks, in a sense, with the circuits of accumulation and development historically constructed, redefining the regional reality (Rocha, 2008).

Vainer and Araújo (1992) emphasizes that these changes recreate the region from the big investment projects. In other words, large projects continue to have great potential for organizing and transforming spaces, a great potential for breaking down and composing regions. An angular point of this issue is the appropriation of the benefits generated by the hydroelectric projects in the region.

In the last thirty years with the maturing of social and environmental discussions, international organizations and financiers, like the World Bank, joined in 1998 new means of development, considering Physical Capital, Human Capital, Social Capital, Institutional Capital and Natural Capital in the so-called Integral Framework of Development to reverse the socioeconomic damages caused by the use of natural resources.

In this context is that learning with the hydroelectric plant of Tucuruí, and more recently with Belo Monte, that the search for new development strategies should consider the conservation of natural resources, the quality of institutions, gender equality, the importance of knowledge and the participation of the local population, the latter reaffirming the importance of social capital, according to Satrústegui (2013).

This article will discuss the projects of the hydroelectric plant of Tucuruí and Belo Monte, identifying the impacts, conflicts and territorial governance of these enterprises and what literature has shown about their experiences, considering the historical and political time in which each of these projects were planned and built in the State of Pará.

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2. Large hydroelectric project in the Amazon

In order to reach a consensus on the importance of territorial governance for regional development around these projects, it is necessary to understand a brief history of hydroelectric projects in the Amazon.

The decision to generate energy through a hydroelectric plant as an energy matrix in Brazil is justified due to the great potential of water resources available in the country. According to Moretto et al. (2012), Brazil has a hydroelectric potential of 260 thousand MW, and in the Amazon this potential is 132 thousand MW (51%) and other regions 125 thousand MW (49%).

One of the first legal instruments to regulate the use of water resources was the Water Code (Decree 24.643 / 1934) that guided the first hydroelectric dams. In search of better technological conditions to conduct the energy sector, Eletrobrás was created in 1962 to coordinate all electric power companies and conduct inventories to identify the hydroelectric potential in all Brazilian territory with resources from the Special Fund of Nations Units and the World Bank (IBRD).

Moretto et al. (2012) emphasizes that the low degree of discipline regarding environmental regulation of large projects has a great influence on the design of these projects and their consequences. Of the 57 hydroelectric plants installed up to 1979, 55 were built in the south and southeast regions, close to the industrial consumer centers and with socio-environmental impacts of little national reverberation. In this period the model of development adopted by the Military Regime in Brazil was based on traditional economic growth "at all costs" (Pike et al., 2006) as identified by Bradford (2012) in research on local economic geography.

The Amazon Region holds about 51% of the Brazilian hydrographic scenario and the State of Pará has a water availability of 62% of the total freshwater in the Amazon, 40% of the national stock with 25% of all Brazilian hydroelectric potential, which 85% still not used, according to Moretto (2012).

In the 1970s, in the midst of international discussions on the environmental issue with the Stockholm Conference (1972), the first and second National Development Plans (1972 - 1974) were elaborated with emphasis on the industrialization of the durable consumer goods sector for the sector of the steel industry, according to Bortoleto (2001). The search for autonomy in basic inputs was strengthened by international pressures and incorporated by the World Bank, the main financier of the hydroelectric dams.

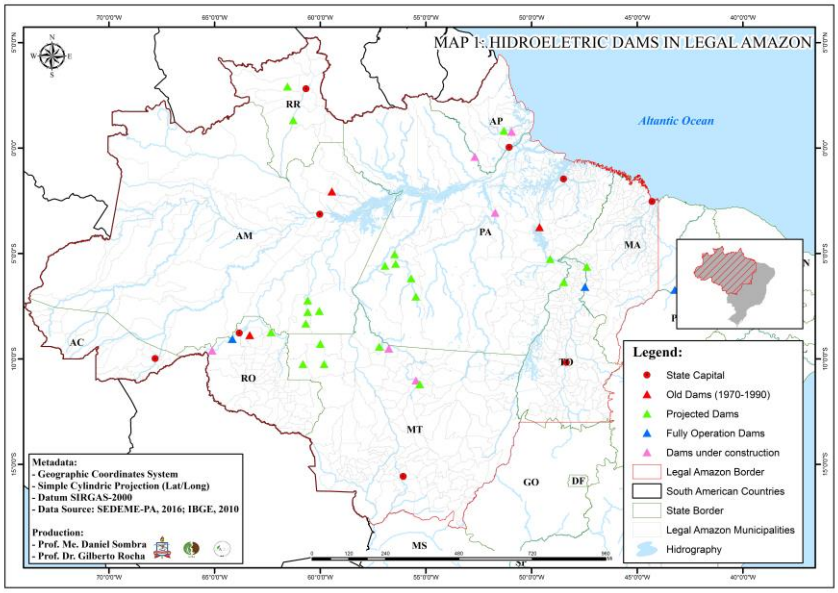
In the 1980s, the 2010 Decennial Plan was revealed with the forecast of 79 dams in the Amazon Region, large of them in the Amazon, Xingu, Tocantins, Araguaia and Tapajós Rivers, which provoked a lot of criticism, according to Fearnside (2015), that last until today, 35 years later. Even though Amazonia has come to represent the national scenario as a region of excellent opportunities and investments with great hydroelectric potential, it has been and still is the target of negative social and environmental impacts of these major projects (Map 1).

According to the State Department of Environment and Sustainability (Semas, 2016), 58% of the territory of Pará is composed of protected areas, including federal, state and municipal Conservation Units, Indigenous Lands and Quilombolas (remanescent population from slavery period). A multi-ethnic scenario with many historical restrictions on public policies, which reveals a sad scenario of low social development indexes.

The contradictions of national development have shown great difficulties facing the development of the Amazon, such as unregulated economic occupation, socio-environmental tensions, environmental degradation, land problems, among others, which are complex challenges for federal, state and municipal governments.

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Map 1. Hydroelectric dams in the Brazilian Amazon



Source: Personal Elaboration

These facts show the controversy of the Brazilian energy sector between the economically favorable alternative due to the great hydroelectric potential and the significant environmental degradation as highlighted by Mello-Théry (2016).
With the creation of the National Environmental Policy (Law No. 6.938 / 1981), the environmental licensing of large projects increased, according to article 10º, which says that the construction, installation and operation of activities that use environmental resources that are potentially polluting or capable of causing environmental degradation will depend on prior environmental licensing. However, the 2010 Decennial Plan was indeed put into practice, as it was necessary to generate more energy to meet the country's economic growth, even when the political scenario changed to Republican.

According to Moretto et al (2012), the use of natural resources by hydroelectric projects serves a characteristic development model based on the construction of megaprojects to increase the supply of electric energy. Thus, Tucuruí hydroelectric power plant was built due to supply a large consumer center with iron ore processing in the state of Pará. Technical problems marked the decade and the history of environmental management in the induction of numerous social and environmental impacts with the flooding of about 2500 m² of Amazonian forest.

Alarming and countless records of the social and environmental damage impacts in the Amazon, impacted nationally by the construction of the Tucuruí Hydropower Plant (1984), since flooding of areas was devastating to the local ecosystem and to traditional and indigenous populations, who still suffer from low rates of development, according to Saracura et al (2007).

In 2010, with the start of the construction of Belo Monte Hydroelectric Power Plant, once again the State of Pará is going through these impacts, but now in a Xingu Region with many Conservation Units and traditional peoples, 11 indigenous lands, according to FGV (2015).

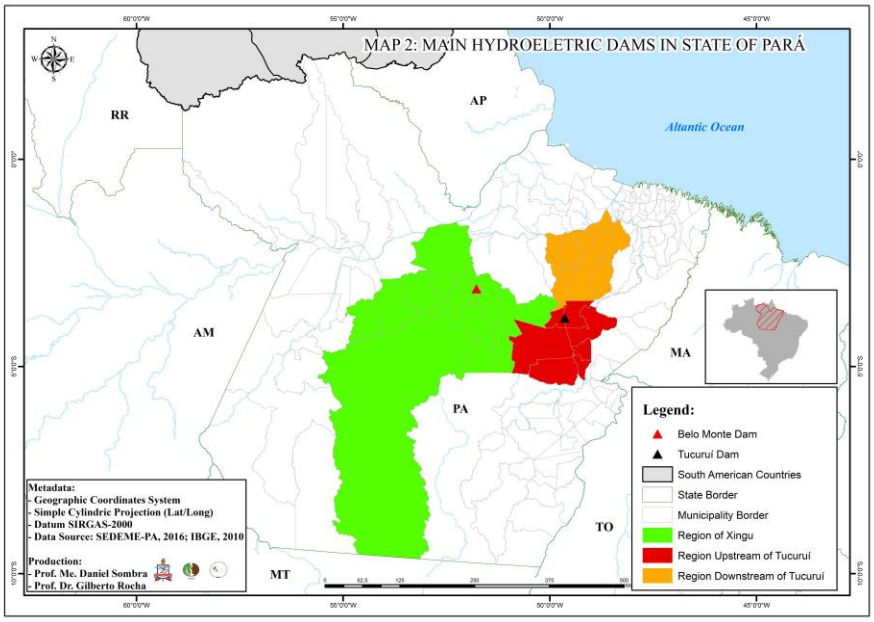
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Mello Théry (2016) points out that infrastructure projects in the Amazon cause migratory flows, occupational densities, changes in land use, deforestation, alteration of biological communities, loss of species of fauna and flora, land conflicts and other socio-environmental problems. In the Xingu Region was not different.

The National Electric Energy Agency (ANEEL) was created by Law No. 9,427 / 1996 with the mission of providing favorable conditions to develop the energy sector with balance for the benefit of society. Thus, with the creation of regulatory norms and economic studies of the energy sector to meet the demands of the country, information on the projects developed and new technologies developed gained strength in 2005 with the creation of the Energy Research Company (EPE).

The new element that came with the Belo Monte hydroelectric plant project was the promise that the project would produce the regional development process even before the Previous License analyzed by IBAMA (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis), which would give time to structure the region to prepare for the socio-environmental impacts. It is in this scenario that the hydroelectric plants of Tucuruí and Belo Monte are distanced by the period and economic, political, social and legal scenario, especially with peculiarities of the territorial characteristics. Currently, both enterprises, due to legal requirements and environmental constraints, have proposals to implement public policies and actions to minimize the impacts generated through social involvement in the formation of territorial governance councils (Map 2).

Map 2. Hydroelectric dams in the Brazilian Amazon



Source: Personal Elaboration

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3. Governance as a territorial development strategy

Authors such as Dallabrida (2007), Tenório (1998) and Cançado et al (2013) highlight the importance of social management as a process of participation of society in public policies for the development of a territory. The social management, such as collective decision-making based on the intelligibility of language, on dialogue and enlightened understanding, must adopt transparency as a presupposition and emancipation as the ultimate goal, according to Cançado (2013). The lack of interaction and dialogue between government, society and enterprises is one of the points of lessons learned in the final report of the World Commission on Dams on Tucuruí Hydroelectric Power Plant (2000).

Social management strategies are also present in the governance model proposed by the National Policy for Regional Development (PNDR) of 2007, in which suggested that dialogue must permeate the process of social relations that are promoted, often through specific actions, response to demands or political interest.

In territories impacted by large projects, it is natural, or a matter of time, the need for dialogue between local society and the enterprise, mainly because social gaps are intensified with the presence of the enterprise. This process is only beginning to be understood before the establishment of a space for negotiation and dialogue according to the precepts of Dallabrida (2011) for the construction of a governance for shared decision-making.

Vieira (2008) understands that social relations constitute a "non-visible", but highly effective, patrimony at the service of social subjects, whether individual or collective. In this sense, social relations based on trust and cooperation are key elements for building and maintaining governance.

Considering governance as the exercise of power and authority to manage a territory or region through processes and institutions which citizens and groups articulate their public interests, including representations of state agents as acting subjects. According to Dallabrida (2011), the need for an institutional relationship, social participation in joint actions of common interest to orchestrate a means of directing public policies becomes clearer, even more with exogenous influences such as hydroelectric projects.
Governance is, in practice, a complex decision-making process that anticipates and surpasses government, according to Milani & Solinís (2002). According to Pereira (2010) and several authors highlighting the texts of Dallabrida (2003, 2007, 2008, 2011), the most evident aspects in the literature on governance are related to the legitimacy of the public space in constitution, to the sharing of power between those who govern and those who are governed, the processes of negotiation between social actors and the decentralization of authority and functions linked to the act of governing.

Regarding territorial governance, Dallabrida (2007) focuses on the definition and management of a territorial development strategy, the establishment of forms of social repairing and the construction of a prospective vision for the future. These processes are not simple to practice in a region with precarious characteristics regarding public management, social participation and with serious problems such as poverty, social inequality and the absence of public policies from all spheres of government such as the Amazon Region.

Faced with the enforced learning by the experiences acquired by the construction of the hydroelectric plant of Tucuruí the social movements have important results in the fight for the answers of the public and private institutions involved in a process of licensing and conduction of a great hydroelectric project. Gaventa (2002) emphasizes among six propositions on participation and territorial governance, the "relationship of people and institutions" being one of the main challenges for the 21st century. The construction of new relations between ordinary people and institutions, especially those of government, that affect their lives.

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Increasingly, there are more mechanisms that can promote these more inclusive and deliberative forms of interaction between the citizen and the state. This institutional interaction presents several forms of understanding and nomenclatures, but all express the participation of local institutions, based on the empirical knowledge for actions and decisions that affect local solidarity, so-called participatory governance.

Given the socio-environmental conflicts experienced in the hydroelectric plants of Tucuruí and Belo Monte in both scenarios, they have absorbed participatory governance methods involving local institutions, social movements and government in the construction of councils and committees in permanent negotiation spaces to mitigate and define new strategies for territorial development.

The negotiation spaces allow the government to approach people by encouraging their participation in public policy in a representative way as a key element of empowering decisions that affect their futures, such as collective innovation processes according to Dallabrida (2010).

To establish a local empowerment, Vieira (2008) mentions the construction of social capital with a political and economic focus and observes the differences in obtaining resources in the emphasis on social networks. These focuses are present in public and private institutions, that is, it is present in the people who represent the institutions and in the strategies of relations established to obtain resources.

The experiences of the populations impacted by the hydroelectric dams highlighted in this article demonstrate articulations, challenges, opportunities and actions regarding peculiar issues, since these scenarios are composed of a society with multiplicity of individuals with diverse interests as analyzed by Filho and Fonseca (2011) when discussing the Douglas North's theories on institutions and social cooperation.

One of the greatest weaknesses in the construction of territorial governance is the quality of available human capital, which is necessary to develop intellectual capital with schooling and professional training, so that social capital has the ability to articulate networks of community integration and interorganizational, aiming to develop the ability to discuss and define consensus for the establishment of collective objectives.

4. Governance as a territorial development strategy

Tucuruí Hydroelectric Power Plant had its first phase completed in 1984, before the requirements of the legislation on environmental licensing, specifically CONAMA (Conselho Nacional do Meio Ambiente) Resolutions 01/86 and 06/87. It was only in 1998 that the environmental licensing process was regularized by the Secretariat of State for Science, Technology and Environment of the State of Pará (SECTAM) with conditions for reformulation of the development of environmental programs. Among them, the creation of Sustainable Development Plans upstream and downstream of the hydroelectric power plant as compensation and mitigation of the impacts caused in the two regions of influence.

With these demands, in 2002, processes were started for the creation of mechanisms for social participation in the region through the Regional Insertion Plan (PIRTUC) and its Management Council (CONGEP) with a coverage of seven downstream municipalities and the with participatory elaboration of the Popular Plan for Sustainable Development of Tucuruí Hydroelectric Power Plant Downstream (PPDJUS) and its Management Council (CONJUS) covering five municipalities. These mechanisms were the result of the demands of the social movements of the municipalities affected by the Tucuruí Hydroelectric Power Plant, which culminated in the implementation of the policy institutionalized by Eletronorte's Board of Directors since 2003, and the creation of

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the Regional Insertion Coordination (EIR), which adopted participatory democracy and principles of sustainable development and sharing responsibilities for activities.

According to a report drawn up by the Eletronorte Regional Integration Coordination (EIR), the actions foreseen by the PPDJUS (R $ 1.6 billion) were financed by Eletronorte in the Regional Insertion Plan of the Tucuruí Hydroelectric Downstream (PIRJUS) and defined its resources over twenty years, with R $ 27 million in the first three years. It was incumbent upon the CONJUS to define the projects to be object of PIRJUS agreements between Eletronorte, city halls and other public institutions.

This experience of participatory management, which took place on behalf of Tucuruí hydroelectric power plant in 2003, involves several ministries (MME, MMA, MDA, MC, MIN, SEAP), public agencies, teaching and research institutions (UFPA, UFRA, EMBRAPA, INCRA, MPEG, ADA, IBAMA), NGOs and has several projects and actions carried out in the areas of education, family agriculture, açaí chain, artisanal shipbuilding, culture, planning and territorial mapping.

This governance space for planning, participation and negotiation is already 13 years old and can be characterized as an important mechanism for the process of territorial development and public policy targeting, however, there is an inevitable conflict of interest between social actors, and it still has many challenges to face.

5. The governance experience in the hydroelectric plant of Belo Monte

The bidding process for the Belo Monte Hydroelectric power plant project had, as legal obligation for the winning company of the event, to commit itself to providing financial resources for the implementation of the Sustainable Regional Development Plan for Xingu – PDRSX, which included the ANEEL Auction Announcement 06/2009. Thus, in 2010, it was defined that Norte Energia should allocate the amount of R$ 500 million to finance the actions of the Xingu PDRS for a period of 20 years. To use this resource, the existence of a territorial governance was necessary.
“The Xingu PDRS was born from the idea that the implantation of large infrastructure works - paving the Transamazônica and construction of the Belo Monte Hydroelectric Power Plant - would be an opportunity to provide a region historically characterized by the fragile state presence of public policies necessary for its development, during and after the construction of these works "(PDRSX, 2010).

In almost six years of existence, the Xingu PDRS, based on a broad participatory platform with monthly meetings, provides an important learning curve for the investment decision-making process for the various dimensions of local development. This experience is of great importance as a starting point for the debate on regional development policy, especially after the construction of the work.

Today the Xingu PDRS has a coverage of 12 municipalities with a governance composed of General Coordination with a representative of the federal government, one of the state government, the president of the consortium of municipalities of Belo Monte and a representative of the civil society, Management Committee (CGDEX), which has five members of the federal government, five heads of state government, five municipal government officials and 15 representatives of civil society participate, as well as the composition of eight technical chambers that are also composed of equal representativeness between government and civil society. total of 256 representatives between incumbents and substitutes throughout the governance of the Xingu PDRS, assisted by a contracted Executive Secretary.

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The decision to allocate the PDRSX resource is collegiate, analyzed and approved by the Technical Chambers by means of Annual Statements, allowing the preparation of projects that are aligned with the actions of the PDRSX as well as the priority guidelines defined by the Technical Chambers.

Promoting action for development in a democratic society, but deeply unequal and historically disadvantaged in relation to the country's great dynamic centers, is not one of the simplest tasks. The deep asymmetries among local actors regarding their worldviews are reflected in the clash of proposals and generate a permanent tension between the focus of clear guidelines of the statements, criteria for project scoring, monitoring of approved projects, elaboration of municipal initiative projects, decentralization of resources for groups, as well as the dissemination of themes involving infrastructure development, environmental management and land regulation, promotion of sustainable productive activities, social inclusion and citizenship, monitoring of the environmental conditions of Belo Monte, traditional and indigenous peoples, health and education.

6. Conclusions

In pursuit of the assumptions of the World Bank, so that they continue to receive funding, in face of a more participatory society and legal requirements regarding socio-environmental issues, the great hydroelectric projects in the Amazon have been a challenge for entrepreneurs to learn to deal with territorial development, to the federal government for being the main decision-maker and licenser of the size of these enterprises, for the state government to inherit the gaps in public policies caused by socioeconomic impacts, for municipal management to face all socioeconomic impacts on the site, in addition to expansion of the need for public services, and especially for people directly impacted by having no alternative but to fight for recognition, respect and dignity.

One of the factors that contribute to the strengthening of human capital in all its connotations is good public governance. However, although the construction of Tucuruí and Belo Monte Hydroelectric Power Plants have been accompanied by several studies, plans and government interventions in an attempt to alert and prepare the population about the socio-environmental impacts, it is clear the need for investment in social capital and management local public to be prepared to deal with the old and new challenges.

The experiences of territorial governance in Tocantins Region and Xingu Region reinforce what the literature shows that initiatives or actions express the capacity of an organized society to manage public issues, based on the joint and cooperative involvement of social actors, economic and institutional. The negotiation spaces are a social and institutional approach and allow for collective learning, interaction and broad participation with a view to territorial development.

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EXPLORING THE KEY ISSUES AND STAKEHOLDERS ASSOCIATED WITH THE APPLICATION OF RAINWATER SYSTEMS WITHIN THE AMAZON REGION*

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Abstract. This paper presents a case study from the Amazon region of Brazil that explores stakeholder influence over the design and implementation of rainwater harvesting systems. This explorative study is based on the application of Social Network Analysis (SNA). A series of interviews were undertaken with experts in the field and the data was coded and analysed. A stakeholder's map is presented in an attempt to summarise the study's main findings and to graphically illustrate the key stakeholder influences. The primary outcome of this exercise was the identification of the key participants and challenges associated with the implementation of rainwater harvesting systems. This exercise also highlighted the lack of interaction between some stakeholders and the canalization of decision-making powers by a small number of agencies. The scope of the study was limited to a specific geographical region and is therefore context specific. Due to the constraints of this preliminary study, the full potential of SNA has not fully been explored in this analysis. The research has identified some redundancies with regards to the management of water in this region. It has also highlighted other issues associated with 'lack of inclusion' within the decision-making process and planning for the implementation of rainwater systems. The study is considered to be novel within this geographical region. The use of such methods to map stakeholders and to graphically represent influential relationships, as well as the identification of previously unseen key actors should aid future attempts to implement rainwater harvesting schemes within this context.

Keywords: Rainwater harvesting systems; Social Network Analysis; Water management

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Additional disciplines: information and communication; environmental engineering

1. Introduction

The Amazon region experiences a number of significant challenges associated with its vast size and limited transport infrastructure. In many places, the river is the only viable transport link. These issues significantly impact the distribution and supply of key products and services, including the provision of clean water. This contributes to high local rates of waterborne disease, which are often aggravated by untreated water supply systems, inadequate/inappropriate sewage treatment facilities and open-air dumps. These issues are highlighted within local Municipal Sanitation and Management Plans which report that 91% of the municipalities have water supply systems. However, in 100% of the Amazon municipalities, the water quality does not comply with the minimum standards for human consumption as defined by the Ministry of Health. According to Brazil's National Water Agency (ANA, 2010), about 70% of the population of the Northern region lack access to potable water. In response to these challenges, rainwater has been explored as an appropriate solution to enhance the provision of clean water to rural communities in the Amazon basin. This paper aims to explore stakeholder influence over the design and implementation of rainwater harvesting systems in this context. This explorative study is based on the application of Social Network Analysis (SNA) (see Section 3). A series of interviews were undertaken with local experts and the data then coded and analysed. A stakeholder's map is presented in Section 4 that summarises the key participants and challenges; these interactions are expounded in Section 5.

2. Water supply problems in the Amazon Region

2.1 Rainwater Harvesting

Harvesting rainwater for human consumption is not a new concept, since it has been employed by numerous civilisations over the centuries (Gnadingler, 2000; Tomaz, 2003; Kautsoyiannis *et al.*, 2008). Contemporary methods typically utilise roofs to collect rainwater. This approach – often described as Rooftop Rainwater Harvesting (RTRWH) - is employed in many different countries. For example, Zhu et al. (2009) report that in Ganzu, one of the poorest regions in China, this type of technology serves 2.5 million people; whilst in New

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Zealand, 11% of the population rely on rainwater as their main source of potable water (Ministry of Health, 2006); and in Thailand, 4.3 % of the urban population and 25.7% of the rural population access drinking water through the collection and storage of rainwater (ONESDB/UNCTT, 2004). Similar techniques have been documented from across the globe (UNEP, 1998); with good examples cited from Venezuela, Maldives, Turks and Caicos, Bermuda, Portugal and Greece (Oliveira, 2008). In these countries, a range of stakeholders are involved in the promotion of rainwater harvesting systems including governments, national and local authorities, international development agencies and social organizations.

Most of these documented cases utilise roofs as the primary mechanism to collect water. But there are differences in the ownership and usage arrangements. For example, some schemes are private, whilst others are publically owned; similarly, some systems are designed serve whole communities, and others just a single household.
The growing interest in the use of RTRWH has been driven by a range of factors – including problems associated with alternative water sources (e.g. contamination of groundwater sources; water system failures, maintenance and operational problems); increasing water demand in rural areas due to population growth; the increasing availability of low cost impermeable materials (e.g. tiles, veneers and galvanised iron roofing components) as a replacement for traditional straw roofs; and the emergence of increasingly economic and effective water storage devices (Fawkes, 1999).

2.2 Rainwater harvesting in the Amazon: Belem case study

The following case study from the Belem district highlights some of the key issues associated with the supply of potable water to riverside communities in the Amazon region. This example highlights local complexities in terms of population, and the number of organizations associated with the management of water distribution and the advancement of future solutions. This study formed part of the wider AguaSocial project which has been described in other publications (Iorio *et al*., 2018).

Two thirds of the Belem district is composed of river islands, in which the provision of water has not been officially registered and managed. This region suffers from the widespread degradation of water springs due to the increasing pressure of urban development. Whilst, the levels of Iron emanating from the local groundwater table are above recommended limits for human consumption. The underground aquifers are at a depth that makes them unviable for use; especially when considering the widespread distribution of population across this region - For example, the underground system in Ilha Grande is inoperative (despite its good condition) and the quality of the water delivered is questionable in terms of its Iron content (Veloso and Lopes, 2014).

Technical studies exploring potable water supplies and consumption patterns were undertaken for Belem and the wider Amazon region by UNESCO in 2004. These studies concluded that despite the vast local water resources, the main limitation for their use for human consumption is related to the qualitative aspects of the water (Aragon, 2004). Veloso (2012) investigated the consumption of water within two islands (‘Ilha Grande’ and ‘Murutucu’); finding that 45% of these riverside populations buy water from informal distributors or ‘boatmen’. These venders typically sell 20 litre barrels of untreated water that is collected either from surface or underground water sources. A further 20% of the surveyed populations reportedly consumed water directly from the river (Veloso, 2012). The study also revealed that these communities often used a combination of different sources of water; for instance, to buy water from the mainland to drink and to use water from the river for cooking. Souza (2012) documented the case of another island ‘Ilha Nova’, where 100% of potable water comes from rainwater collectors; whilst Fenzl *et al*. (2010) highlighted the unique case of two islands (‘Mosqueiro’ and ‘Outeiro’) where the water is distributed via a public aqueduct.

In consequence, rainwater has been proposed as an appropriate source for human consumption in Belem (and the Amazon in general) due to the logistical challenges experienced in this region (e.g. limited

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transport/communication infrastructure; vegetation growth, river tides, high humidity, instability of the subsoil) and the wide geographical dispersion of the rural communities that would adversely impact the viability of conventional clean water distribution networks.

Many recent rainwater collection systems employed within the Belem district, have been informal adaptations of the 'cistern based technologies' that have been implemented in other areas of Brazil. These modifications are the result of independent attempts to solve the issue of access to clean water by the riverside communities themselves (Veloso, 2012). The 'cistern-based' approach was initially implemented in the semi-arid region via the 'One Million Cisterns' program; the Semi-Arid Articulation (ASA) program has been fully implemented providing concrete cisterns for multiple users. This was implemented through partnerships with individuals, the private sector, cooperation agencies and the federal government. However, some concern has been expressed regarding the quality of water delivered by these systems (Gnadingler, 1999; Gnadingler, 2007; Joventino *et al*., 2010; Souza *et al*., 2011 and Silva *et al*., 2012). Furthermore, this technology has not proved to be appropriate for the bioclimatic conditions of the Amazon; and particularly for those riverside communities whose land is subject to the regular river tides and high levels of subsoil moisture and instability (Veloso, 2012).

In response to these local problems, the University of Para (UFPA) established a research project to explore the use of rainwater as a potable resource for riverside and rural communities in the region. This project sought to appropriately adapt RTRWH technologies for the inherent local conditions. This research, and its resultant technological solutions have been well documented. These studies have explored the suitability of the aforementioned local RTRWH solutions to the bioclimatic conditions of the region and the impact of these to the riverside communities in terms of their access to quality and quantity of clean water, health and economic viability (Veloso *et al*., 2013). The implementation process that was employed for the RTRWH approach employed slightly different mechanisms to those used for the ASA. In terms of the Belem case study, the project implementation was fully funded by the government; and involved multiple federal and local agencies, NGOs with strong influence in the region and community organizations.

However, a systematic identification of the key stakeholders and issues that affect the implementation and subsequent maintenance of the rainwater systems has not been documented. This is particularly relevant as the Amazon region is characterized by being under the jurisdiction of several offices at different administrative levels in the Brazilian government, and contains a multiplicity of communities that make this a highly complex case study in terms of policy making and socio-economic and technical interventions. In this context, this study intends to undertake an initial exploration of these complex interactions through the identification of key issues and stakeholders affecting the implementation of Rainwater systems using methods related to the analysis of complexity such as Social Network Analysis.

3. Methodology

Standard 'stakeholder mapping techniques' were used and enhanced by the use of Social Network Analysis (SNA). This exercise employed methodologies that have previously presented by Prell *et al*., (2007); Lim *et al*., (2010) and Lienert *et al*. (2013); and particularly focused upon the use of centrality measures to: assess the importance of the respective stakeholders; to anticipate possible conflictive relationships; and to enhance their participation and level of engagement with future design interventions.

The collection and analysis of data followed a two-stage process in which stakeholders were identified and classified via an iterative process that drew on a combination of methods (e.g. expert opinions, semi-structured interviews). This process followed the suggested multi-method approach by Brugha and Varavasovsky (2000) and

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Reed *et al.* (2009). To identify stakeholders, the respondents were asked to: 1) mention all stakeholders and issues that may influence or are affected by the implementation of rainwater systems; 2) quantify the influence each stakeholder exerts upon water infrastructure planning (Brugha and Varavasovsky, 2000). Similar stakeholders, such as community organizations, were merged into stakeholder groups, in an attempt to simplify the analysis.

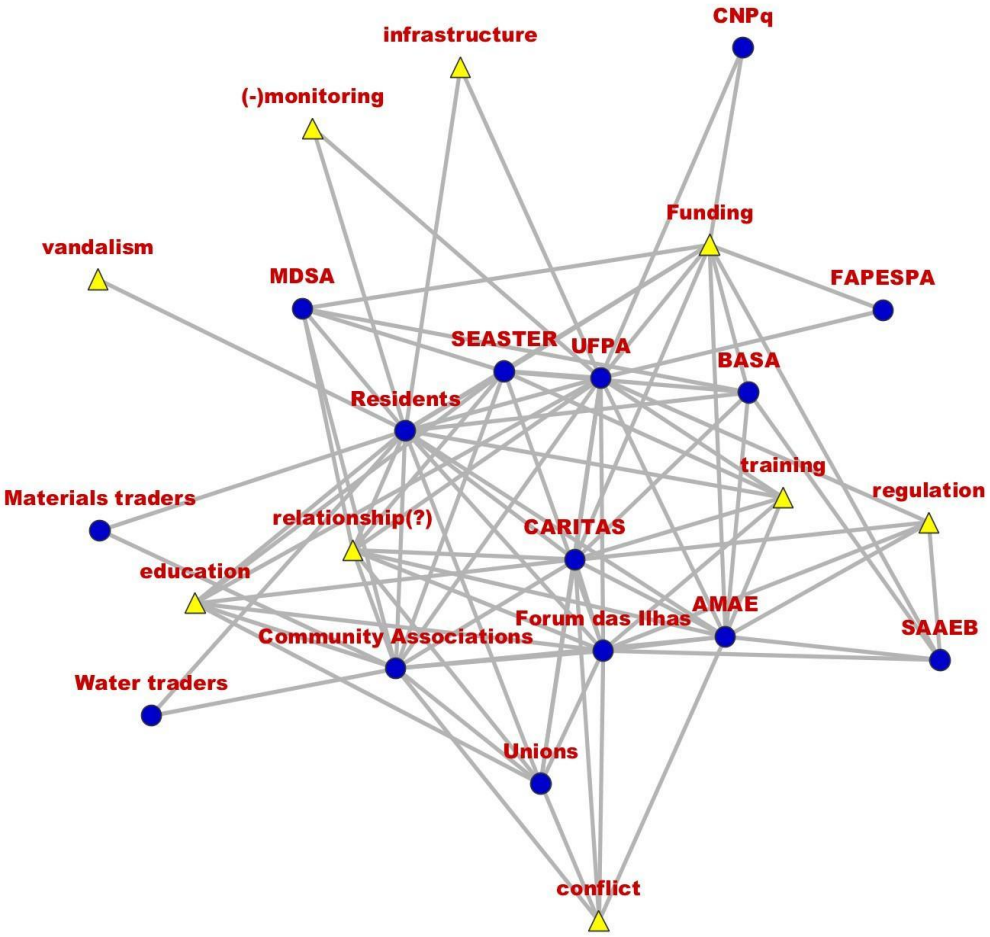
A 'relational matrix' was created based on a typology in an attempt to classify stakeholders along the vertical axis (i.e. from national, federal, county, local, and off-site levels to a local, on-site level). A further typology was employed to distinguish between those agents who affect (determine) a decision/action, and those affected by this decision/action. The matrix also included those issues that had been identified in the conversations with experts and how these issues related to the different actors. This data was analyzed in UCINET (Borgatti *et al.*, 2002). The potential influence of stakeholders upon the policy making process can be assessed in network terms via their connectivity to others. To assess this feature, we used measures of centrality as described by Freeman (1979). More specifically, we took into consideration the measurement of degree centrality, which considers the ties that each stakeholder shares directly with other stakeholders. It considers the local structure in which an actor is embedded (Akhmetshin et al., 2017; Ansell, 2003; Crona and Bodin, 2006). In policy networks, stakeholders with high degree centrality have better and more direct access to information and have considerable potential for framing the planning process. Power and importance were assessed via 'betweenness centrality' (Freeman, 1979; Ingold, 2011). Where 'betweenness centrality' calculates the number of times a stakeholder is on the path between two non-interlinked nodes. A stakeholder with high 'betweenness centrality' can thus act as a 'gatekeeper' or 'mediator'. If absent, the network would fall apart. Hence, the more central the stakeholder is, the better they are integrated into the network and can influence the planning process in resource management policy.

4. Results and analysis

The results of the SNA mapping exercise for the issues and stakeholders associated with the implementation of rainwater systems in the Belem district are presented in Figure 1.

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Figure 1. Identification of issues and stakeholders for the implementation of rainwater systems in the Belem District.



Source: Personal Elaboration

It should be noted that issues are represented on Figure 1 by triangles and the stakeholders by circles; whilst the connections between them are represented by links. The analysis of the connectivity of stakeholders and issues is guided by their 'level of centrality' and 'betweenness'; with some nodes (issues and stakeholders) ranked according to parameters such as degree and betweenness – to reflect their influence in the network and functions of brokerage. These 'nodes' were ranked (see Table 1 for Issues and Table 2 for Stakeholders) in terms of their structural position and role/function within the network, as well as their values of centrality (degree and betweenness).

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Table 1. Classification of Issues that impact the implementation of rainwater systems in the Belem District (ranked in terms of importance)

Funding	With the highest value of connectivity this issue is the most connected to stakeholders and seems to strongly influence the future implementation of rainwater systems. The fact that the funding comes mainly from three sources (Government: via public bank - BASA; Research funds - FAPESPA- and Charities) makes the implementation extremely dependant and sensitive to the financial environment.
Education	This issue is connected to providers (UFPA, CARITAS, Forum das Ilhas) and the recipient community (either directly or via several community organizations: unions, community associations). In general, the education linked to rainwater systems and their implementation appears adequate, however, it is sensitive to the level of education and the social dynamic of the recipient communities (e.g. peer pressure, the perception of wealth).
Conflict	This issue was connected mainly to the different organizations acting in representation of the recipient communities. Community organization is a complex issue itself, as there are more than 100 different community organizations in the region with different agendas and political interests. It is noticeable that the issue was not raised in relation to the multiplicity of governmental agencies involved - in many cases with overlapping functions.
Relationship	In general, the issue relates to the brokerage function between delivery organizations and recipient communities. the common perception from stakeholder interviews is that the relationship between delivery organizations - at different governmental levels (e.g. MDSA - Federal government; SEASTER - County government; AMAE - Municipal government) must improve and be more efficient.
Monitoring & Maintenance	Despite the provision of recent training on monitoring and infrastructure maintenance. These components appear deficient and unconnected to governmental agencies. Only UFPA currently perform limited observations on the operational status and condition of a limited number of rainwater systems in the region - aiming to develop a systematic approach to collect information to inform policy.

Source: Personal Elaboration

Table 2. Classification of Stakeholders that impact the implementation of rainwater systems in the Belem District (ranked in terms of importance)

Residents	Their high level of centrality is easily explained as these are the direct recipients of the rainwater systems.
CARITAS	CARITAS (Catholic NGO) is perhaps the most influential organization at the ground level. It is well connected with all the key governmental organizations at all levels (Federal, County, and Municipality) and has strong links with the communities and community organizations in the region.
UFPA	The Federal University is a well-connected organization with strong links with governmental agents. Its brokerage role is crucial as is the only agent in the network with links with federal institutions such FAPESPA and CNPq.
SEASTER	Its high level of centrality is explained as it is the only organization and county level related to the delivery and implementation of rainwater systems. They act as brokers for federal agents and point of contact and coordination for local agencies.
Community Associations	Their centrality is explained as they act as intermediaries with final users for the implementation of rainwater systems. They have high levels of complexity due their number and variety.
Forum das Ilhas	Its high level of connectivity relates to its function as a broker at a local level. Structurally equivalent to CARITAS, it lacks the connections with organizations at the federal level.
Unions	Their centrality relates to the connections with local organizations at the community level. Structurally equivalent to community associations

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Material Traders & Water Traders	These stakeholders are negatively influenced by the implementation of rainwater systems as their economic activity is related and dependent on the existence of such autonomous water supply systems. Is noticeable that they are not connected with any of the delivery organizations suggesting that they have not been involved in any stage of the development and implementation of rainwater systems. This is reflected by significant low values of centrality.

Source: Personal Elaboration

5. Discussion

This study has indicated that the key stakeholders are the Residents, UFPA, SEASTER and CARITAS. Their importance in the network is related to the fact that most of them are local to Belem and that they are key brokers for the design and implementation of local rainwater systems. These stakeholders (UFPA, SEASTER, CARITAS) also play an important role in terms of applying for public funds and liaising with other public agencies at different administrative levels (State, Federal, National). Further research is recommended to better understand their role and impact in the event of privately funded implementation of rainwater systems.

From the interviews and the SNA, it is evident that the implementation of rainwater systems is highly dependent on public funding where the NGOs (e.g. CARITAS) act mostly as delivery partners. In this sense, to increase the use of rainwater in the region – given Brazil's current economic climate – this study highlights the need to explore new sources of funding based on private capital and/or autonomously funded by the recipient communities (for instance via social entrepreneurship and/or social banking).

The study also suggests that the overlapping functions of governmental agencies at different levels (Federal, County, Municipality, Local) are not problematic at a practical level - due perhaps to accumulated expertise/experience by delivery agencies at the community/local level. However, this has the potential to be a major issue in terms of the level of ownership and autonomy that communities might have during the implementation process. This issue could be exacerbated by the current economic environment and the budget limitations of the multiple agencies involved. In this respect, the study suggests that more autonomy in the local administration with more direct access to funding sources could simplify and reduce the administrative complexity and cost of the implementation process. Here again, the adoption of private or autonomously funded initiatives could bypass and/or simplify the complexity and bureaucratic cost of the multiple overlapping agencies involved; increasing the relevance of the local agencies that could locally regulate the implementation of rainwater systems.

The second major issue at the local level is the complexity and variety of community associations (generalized in this study but with more than 100 groups in the Belem area). These groups play an important role in the recipient end of the implementation process facilitating issues such as ownership and management of the rainwater systems; the existence of unions with structural equivalence in the network may suggest that such groups could be used to bypass the role/function and complexity of the community associations to deliver rainwater systems. It is also noticeable that the strong local influence of CARITAS is derived from: their religious affiliation (Catholic charity); their contacts with different agencies at different administrative levels; and their capacity to mobilize financial resources.

In terms of the design process, it is concerning that not all the economic/social groups affected by the implementation of the rainwater systems have been involved in the different stages of development and implementation of rainwater systems in the region. It is particularly concerning, that some groups who might be negatively affected by this initiative (e.g. water and building materials traders) have been excluded from the decision-making process. It is recommended that these stakeholders are consulted with respect to any future

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expansion of this initiative; and particularly if private funding is being sought; as these stakeholders may either act as key partners or competitors if a marked based implementation process is adopted. That said, to date rainwater has proved to be more economically efficient than the distribution of bottled water.

6. Conclusions

It is considered that the SNA methodologies represent a useful tool to help map and analyse the complex functions and relationships between the different agents associated with this issue. However, the scope of the SNA techniques employed for this study have been constrained by data collection issues and the size of the datasets used. Limited access to information, public records and the availability of data and time have impacted the depth of this exploration. The use of more complete datasets including interviews (i.e. cascade model) involving all the agents identified as well as a comprehensive literature review of previous implementation exercises might provide a more detailed view of the issues affecting the implementation of rainwater systems in the region. This in turn should lead to a better understanding of the institutional aspects affecting the development of this initiative. At ground level, the use of interviews could more accurately identify key stakeholders in the communities who play enabling roles. This additional knowledge could enhance future attempts to secure other forms of funding.

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ECONOMIC ASPECTS OF THE CREATION OF MOBILE UNITS PROVIDING EVERYDAY SERVICES IN OFF-ROAD CONDITIONS IN WESTERN SIBERIA

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Abstract. This article proposes a solution to alleviate socio-economic problems faced by rural areas in Western Siberia, such as the municipal districts of Omsk region, which are seasonally cut off from national transport infrastructure due to extreme climatic conditions. Specifically, it explores issues related to the provision of basic, everyday services in such regions. Based on an opinion poll which identified a significant need for better provision of everyday services such as hairdressing salons, repair shops and so on in remote regions of Western Siberia, the authors propose a model for an investment project to develop mobile units to provide such services. The costs of setting up such units and the period of time required to recoup those costs, as well as the benefits they will bring to the societies in question, are examined in depth. The provision of government financial support for setting up businesses engaged in this kind of social enterprise is also explored.

Keywords: Western Siberia; Rural territories; Off-road conditions; Mobile Units

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1. Introduction

The service industry plays an important role in supporting populations and in the socio-economic development of countries throughout the civilized world. The social importance of everyday services is highlighted by the fact

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that services take a share, on average, of 31% of the US consumer budget; this figure is 37% in the UK, 41% in Sweden 41%, and about 13% in Russia (Shainyan, 2007). Transport is an essential part of the industrial and social infrastructure (Tvaronavičienė 2018). The low level of development of Russia's transport infrastructure can be explained not only by a lack of funding, but also by the severe natural and climatic conditions experienced by most parts of its territory. As a result, the majority of Russian regions are described as having seasonal problems with off-road conditions, in that many villages and even entire territories are not connected by ground transportation to the rest of the country for much of the year. The only alternative available in this case is air transportation, which also requires certain infrastructure. Taken together, these problems lead to a decrease in the level of satisfaction among rural populations with the way in which their everyday needs and social requirements are met during such times.

Analysis of condition of rural areas in Omsk region indicates at its low socio-economic development. Particularly, there is a decrease of population because of a significant migration from the region due to the deterioration of living conditions (Table 1).

Table 1. Indicators of living standards of the rural population of the Omsk region

Indicators	Years					2015 to 2011, %
	2011	2012	2013	2014	2015	
Population at the end of the year, '000 people	884,4	822,4	818,2	813,3	807,8	91,3
Migration increase, people	-215	-3050	-4306	-6098	-6784	31,6 times more
The ratio of the average wage in the countryside to the wages of the urban population, %	59,6	59,8	60,8	62,8	64,7	5,1
The average number of workers employed in agriculture, '000 people	26,9	24,5	21,8	21,2	19,5	72,5
The number of cultural and community institutions	1079	1084	1079	1059	1051	97,4

There is a need for the state to take a pro-active stand on creating the conditions for socio-economic development: to improve the quality of transport services, to reduce the total expenses for those dependent on transport, to improve the national transport system's competitiveness, to strengthen innovation, and to encourage socially and ecologically oriented development within the transport industry (On approval of the state program of Omsk region "Development of transport system of the Omsk region", #262-P, 2013; On approval of the state program of the Russian Federation "Development of the transport system" #319, 2014).

Public services enterprises in industrialized countries use the latest technology for providing services and regularly modify the existing equipment in accordance with developments in science and technology.

The most profitable areas of consumer services in the US and Europe are dry cleaning and laundry, as well as health and beauty salons. Franchising is one of the most common ways of network business development (Shainyan, 2007).

In Russia, the service sector is developing in large cities. In small areas, especially in those with low infrastructure development, the public and private partnerships need to be developed. The assistance of state structures and funds in preparation of socially significant projects, their partial investment ensures development of comfortable life for the population.

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2. Analysis of recent publications on the issue

Aspects of the development of social infrastructure in rural Russia which experience off-road conditions are noted in the works of (Akhmetshin et al., 2017; Akhmetshin and Osadchy, 2015; Shumakova et al., 2012; Poltorykhin et al., 2015; Nardin et al., 2015; Shumakova et al., 2015). On the strategy of sustainable development of rural territories of the Russian Federation for the period through to 2030 #151-r., 2015; On general principles for the organization of local government in the Russian Federation, #131, 2003). S. Marsat and B. Williams note that in the UK investors are concerned about the disclosure of social information given the historical importance attached to social issues in the country. This is consistent with other recent studies which show that investors around the world are currently concerned about the social activities of the companies they invest in (Marsat and Williams, 2014, p. 11).
Issues of corporate social responsibility are given a lot of attention in many countries; for example, the European Commission has highlighted the responsibility of enterprises for their impacts on society (A Renewed EU Strategy 2011-14, 2011), as reflected in their Green Paper on "Promoting a European framework for corporate social responsibility" (GREEN PAPER: Promoting a European Framework for Corporate Social Responsibility, 2001). The companies should focus exclusively on maximizing shareholders' wealth has long been the dominant assumption in economics studies (Shannon et al., 2009, p. 143). However, taking social responsibility into consideration in the provision of everyday services is of interest because it suggests that firms are motivated to make decisions that do not always clearly maximize the wealth of the owners.

D.V. Moser and P.R. Martin note that the activities in the field of everyday services meet the needs of a broad group of stakeholders, not only the business owners (Moser and Martin, 2012, p. 798).

Some foreign authors, such as Wegren S.K. (2016), Velikii, P.P., Morekhina, M.Iu. (2006) and Granberg L. (2016), link the unsatisfactory quality of social and domestic services in rural areas with the lack of support from the state for the agro-industrial complex, since the agribusiness enterprises are the main places of work in the village (Glass and O'Brien, 2016), which in turn undermines the country's food security (Wegren et al., 2017; Wegren et al., 2016; Svetlanská et al., 2018).

Meanwhile, the economic aspect of the formation of mobile units providing social and everyday services in off-road conditions is understudied and remains open.

The purpose of this study is to develop activities aimed at improving transport infrastructure to meet the everyday needs of rural populations in off-road conditions, including the formation of projects investing in the organization of mobile units which can provide everyday services.

The subject of research. Tarsky Municipal District of the Omsk region with the district center in the city of Tara is a typical representative of the northern areas of the region. The climate here is sharply continental. The average annual air temperature is zero degrees Celsius. Rarely the weather reaches an absolute minimum in the winter - minus 45, and a top maximum in the summer - plus 45 degrees Celsius.

The main industries are agriculture, forestry and timber industry. The biggest share of economic entities operating in these sectors is small and medium-sized businesses.

The distance from the district to the regional center - 302 km. Area of Tarski district is 15,600 sq. km. 45,600 people live in Tarski district. There is a natural decrease, the population in 2014 – 45,832 people, in 2015 – 45682. Moreover, 42.3% of the population lives in rural areas. These areas include one urban settlement, which comprises three communities and 21 rural settlement, which include 73 communities.

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With a lack of district budget, which is 939,9 m. rub. in 2015, the social sphere is prioritized for the Administration.

3. Materials and methods of study

The goals and objectives of the study were achieved through the following scientific methods: economic and statistical, abstract and logical, design and constructive, as well as the methods of expert evaluations, microeconomic analysis of the economic phenomena and processes, and other methods of socio-economic research.

The provisions of the management theory, economic theory, statistical analysis, microeconomic forecasting were applied in the work. The works of well-known economists, legal acts regulating the sustainable development of rural areas, statistical materials and Internet resources were used in the study.

In particular, in order to evaluate household and social needs of the population in rural areas carried out an opinion poll among the population Tarski district of the Omsk region. Authors of the article with use of expert evaluation formed a list of 26 questions with many possible answers including:

- Note the presence of facilities in the territory of rural settlement (health, education, culture and arts, physical culture and sports, trade and public catering, consumer services, telecommunications, transport infrastructure, highways);
- Are you satisfied with the quality of (transport services, roads, heating, water, electricity, gas);
- How do you rate the conditions (teaching in schools, education of children in pre-school institutions, health care, cultural services, habitation);
- How do you rate the level of (supply of food and industrial goods, consumer services, the availability of public transport);
- Which factors, in your opinion, have the greatest influence on the development of social infrastructure: (State agricultural policy, the level of development of agricultural production, location of rural areas over the location of cities, large settlements, habits, historical experience, the traditional way of life of the rural population, the level of engineering development of the territory; the roads).
- Your suggestions to improve the level of provision of household and social needs of the population in your villages.

Experts in the formation of the issues made by scientists of the Omsk State Agrarian University and specialists of the Ministry of Agriculture and Food of the Omsk region.

In the study, it was surveyed from 5 to 10 people between the ages of 20 and 65 from each village. The research results allowed to identify the main factors influencing the development of social infrastructure in rural areas (table 2).

Table 2. Factors influencing the development of social infrastructure

Factor	% of respondents
State agricultural policy	9,5
The level of development of agricultural production	14,2
Location of rural areas over the location of cities	9,5
Habits, historical experience, the traditional way of life of the rural population	4,8
Level of engineering development of the territory	23,8
Roads	38,2

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The main factors constraining the development of social infrastructure identified as roads and low engineering development of the territory. When respondents were asked about the changes in living conditions over the past 5 years, the following answers were obtained (table 3).

Table 3. Analysis of the responses to questions about the changes in the living conditions of the rural population, %

Factor	deterioration	Without changes	improvement
Terms of education of children	42,8	38,1	19,1
Terms of raising children in preschool	33,3	23,8	42,9
Medical service	28,7	52,3	19,0
Cultural service	38,1	47,6	14,2
Living conditions	19,1	57,1	23,8
Supplying food products	33,3	42,8	23,8
Supplying industrial goods	42,8	38,1	19,1
Consumer services	90,5	-	9,5
Availability of public transport	28,6	57,1	14,3

As can be seen from the data, more than 90% of respondents noted the deterioration of public services, more than 40% – deterioration in the terms of education and the supply of industrial goods. Living conditions in the bulk of the respondents remained unchanged, only 23% of respondents could improve their living conditions, while for 19% of respondents they will be only worse.

Reduction of social infrastructure objects in remote areas impacts negatively on their development and accompanied by a deterioration of transport services.

4. Results of study

The poll revealed significant needs in a range of social infrastructure facilities such as hairdressing salons, gas stations and others. Therefore, this study proposes the creation of mobile units to provide some of these essential everyday services. These mobile service units are intended to provide a range of social assistance and everyday services to residents of remote areas of the country. The basic model would include a hairdresser; repair, maintenance and servicing of household appliances; clothes repair and tailoring; and shoe repair. Social security and pension fund experts, lawyers, notaries, representatives of credit, trading, banking institutions, etc. can also work from mobile units. These mobile service units would operate most effectively with the creation of regional and interregional centers for social assistance and everyday services. The economic activity of the mobile units would involve implementation of the following costs in the context of services provided.

1. Hairdressing salon.

Investment costs for the creation of a mobile hairdressing salon are presented in Table 4.

Table 4. Investment costs of setting up mobile hairdressing salon units

Expenses	Pcs	Price per piece, USD.	Amount, USD.
1. Vehicle	1	15 384.61	15 384.61
2. Equipment (special rigging) for water supply	5	-	92,31
3. Heating, ventilation, air conditioning equipment	1	284.62	284.62
4. Electrical supply and lighting equipment	4	-	947.69
5. Furniture and other special materials	19	-	404.62
Total	x	x	17 113.85

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Detailed interpretation of certain types of investment costs is presented in Appendix 1.

Current costs of creating a mobile hairdresser in a year constitute 19,397.07 dollars. Their composition, structure, and explanations are given in Appendix 2.

The calculation of the expected profit is presented below.

The throughput capacity of one hairdresser is 20 pers./day. A working shift is 10 hours (600 min.) Throughput capacity of 1 specialist per year is the following:
20 pers./day · 247 working days = 4,940 pers.
Throughput capacity of 2 specialists per year:
40 pers./day · 247 work days = 9,880 pers.
The average price of the service provided is 2.31 USD. Revenue per annum (1 specialist):
4.940 · 2.31 = 11 411.4 USD
Revenue per annum (2 specialists):
9.880 · 2.31 = 22 822.8 USD.

If there are two specialists in a mobile hairdresser, the time taken to serve the local population (3,857 people) would be three months. Let's estimate the effectiveness of this project using financial and economic indicators (Tables 3-5). The total expenses (investment and current) are presented in Table 5.

Table 5. Predicted returns on mobile hairdressing units in the first year

Indicator	Amount, USD
Registration of an individual as a private entrepreneur	12,31
Investment costs	17 113,85
Current expenses	19 397,07
Total cost in the first year	36 523,22
Revenue per annum	22 800
Profit (loss)	(13 723,22)

Table 6 calculates how long it will take for a mobile hairdressing unit to meet its setup costs.

Table 6. Predicted mid-term returns on mobile hairdressing units

Indicators	Payback period, years				
	2015	2016	2017	2018	2019
Profit/ USD.	3 402,92	3 675,38	3 9362,62	4 168,62	4 377,18
Investment costs/ USD.	147 113,85				
Cash flow on the project/ USD.	-13 710,92	-10 035,54	-6 1012,92	-1 934,31	2 442,77
Payback period/ years				4,4	

According to this calculation, the costs of a mobile hairdressing unit would be repaid after 4.4 years.

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2. Repair, maintenance and servicing of household appliances; clothes repair and tailoring; and shoe repair

Investment costs for setting up mobile service units for repair constitute 18,513.85 USD. (Table 7).

Table 7. Investment costs of setting up mobile repair units

Expenses components	Pcs	Price per piece, USD.	Amount, USD.
1. Vehicle	1	15 384.62	15 384.62
2. Equipment (special rigging) for water supply	5	-	92.31
3. Heating, ventilation, air conditioning equipment	1	284.6	284.6
4. Electrical supply and lighting equipment	4	-	947.69
5. Furniture and other special materials	19	-	1 804.62
Total	x	x	18 513.85

Detail information of certain types of investment costs is presented in Appendix 3.

The calculation of the expected profit is presented below.

Current costs of setting up mobile location social purpose of repair in the first year of operation amounted to 18,025.9 USD. Their composition, structure, and explanations are given in Appendix 4.

The capacity of the mobile service - 30 people a day. Since the demand for these services are experienced by about 20% of the rural population (3875 persons.), the term of service of the rural population of Tarski district is 128 days.

Based on a working shift of 10 hours (600 min.), the throughput capacity of 1 specialist is 10 pers./day. The throughput capacity of 3 specialists would therefore be:
30 pers./day · 247 work days = 7,410 pers./ year

The term of service of the rural population of Tarsky district is 128 days. This amounts to 1.9 turns per year (247 working days).

The average price of such services is 2.85 USD. Revenue per annum is:
7,410 · 2.85=21 118.5 USD

The predicted costs, revenue and profits of mobile repair **units** are presented in Table 8.

Table 8. Predicted returns on mobile repair units in the first year

Indicator	Amount, USD
Registration of an individual as a private entrepreneur	12.3
Investment costs	18 513.8
Current expenses	18 025.9
Total cost in the first year	36 552.1
Revenue per annum	21 090
Profit (loss)	(15 462.1)

Table 9 calculates how long it will take for mobile repair units to cover their setup costs.

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Table 9. Predicted mid-term returns on mobile repair units

Indicators	Payback period, years				
	2015	2016	2017	2018	2019
Profit, USD	3 064.2	3 307.7	3 540.9	3 753.4	3 941.1
Investment costs, USD	18 513.8				
Cash flow on the project, USD	-15 449.7	-12 140.5	-8 599.5	-4 846.2	-905.1
Payback period, years					5.2

According to this calculation, the project will be repaid after 5.2 years.

4. Discussion of the results

An assessment of the cost-effectiveness and feasibility of implementing a project investing in mobile hairdressing units is presented in Table 10. The forecast also examines the feasibility of implementing the investment project in 2016-2019.

Table 10. Assessment of cost-effectiveness and feasibility of implementing mobile hairdressing units

Year of operation	Earnings,USD	Project costs, USD	Profit, USD	Evaluation of the budget effectiveness						
Proprietary funds				Target tax proceeds, USD.						Target tax proceeds, USD
2015		14 036.9		Tax on imputed income	Personal income tax	Transport tax	Total	of which to the budget of RF subjects	of which paid to the local budget	Contributions to non-budgetary funds
Size of state support, USD										
2015		3 076.9								
Operating results, USD										
2015	22 800	19 397.1	3 402.9	168	1 080	615.4	1 288	958	330	2 508.9
2016	24 624	20 948.8	3 675.4	181.4	1 080	615.4	1 301.4	958	343.4	2 508.9
2017	26 347.7	22 415.4	3 932.6	194.2	1 080	615.4	1 314.2	958	356.2	2 508.9
2018	27 929.2	23 760.2	4 168.6	205.8	1 080	615.4	1 325.8	958	367.8	2 508.9
2019	29 324.9	24 948.2	4 377.1	216	1 080	615.4	1 336	958	378	2 508.9

Modern equipment, imported stocks of supplies and advanced sterilization equipment ensure the autonomous operation of a mobile laboratory complex for a long time. A mobile laboratory complex maintains comfortable working conditions at an ambient temperature of -30°C to +40°C.

An assessment of the cost-effectiveness and feasibility of implementing an investment project to create mobile repair units is presented in Table 11.

According to the "Procedure for provision of subsidies at the expense of the regional budget to small and medium-sized businesses for financial support (compensation) for part of the costs associated with the implementation of socially important projects in the municipalities of Omsk region", found in the subprogram

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"Development of small and medium-sized enterprises in Omsk region" in the state program "Development of the economic potential of Omsk region" (approved by Resolution of the Government of Omsk region dated 10.16.2013 No. 266-P), a proportion of the investment costs might be covered by state support (subsidies).

Table 11. Assessment of cost-effectiveness and feasibility of implementing mobile repair units

Year of operation	Earnings, USD	Project costs, USD	Profit, USD	Evaluation of budget effectiveness						
Proprietary funds				Target tax proceeds, USD						Target tax proceeds, USD
2015		1003,4		Tax on imputed income	Personal income tax	Transport tax	Total	of which to the budget of RF subjects	of which paid to the local budget	Contributions to non-budgetary funds
Size of state support, USD										
2015		200								
Operating results, USD										
2015	21 090	18 025,8	3 064,2	252	1080	40	1 372	958	414	2 508,9
2016	22 777,2	19 467,8	3 309,2	272,2	1080	40	1 392,2	958	434,2	2 508,9
2017	24 371,5	20 830,7	3 540,9	291,2	1080	40	1 411,2	958	453,2	2 508,9
2018	25 833,8	22 080,5	3 753,4	308,6	1080	40	1 428,6	958	470,6	2 508,9
2019	27125,5	23 184,6	3 941,1	324,2	1080	40	1 444,2	958	486,2	2 508,9

The amount of subsidy available is 90% of the planned expenses of a small business implementing a socially important project, to a value of not more than 15 384.6 USD per business.

6. Conclusion

Social corporate responsibility has recently been given a lot of attention. The scope of public services plays an important role in the supporting everyday life and socio-economic development in various countries.

Based on an opinion poll which identified a significant need for better provision of everyday services such as hairdressing salons, repair shops and so on in remote regions of Western Siberia which are cut off from the roads during winter, the authors have proposed a model for an investment project to develop mobile units to provide such services and calculated their cost-effectiveness.

The calculations showed that the payback period on the projects would be 4.4 years for mobile hairdressing units and 5.2 years for mobile units offering for repairing of household appliances, footwear and clothing.

An important finding of the study is that the implementation of these projects, in addition to the economic benefit, will provide a significant social effects, such as:

- creating new jobs;
- satisfying the everyday needs of the population;
- improving the level of public services;
- improving the quality of life of isolated rural populations;
- increasing income levels;
- reducing unemployment;
- an increase in payments to local budgets.

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It is important to note that the achievement of this effect is related to the costs of certain business structures. However, the social effect also plays into the hands of these business structures in the future. This is confirmed in a number of scientific researches and is also in line with the state policy of many countries. Similarly it is important for Russia, as it promotes the adaptation of rural society to market conditions.

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Appendix 1

Auxiliary equipment and support systems include:

Water supply: water tank 50-80l (6,2 USD), stainless steel sink (10,8 USD); pump for the water supply 12V (15,4 USD); electric heater 15l (35,4-53,8 USD); canister for collecting the used water 30l (6,2 USD). *Heating, ventilation and air conditioning*: additional heater (284,6 USD). *Lighting*: strip lights 220V (2 pcs.) (3,7 USD).

Electricity supply: diesel generator (1000 USD); device to connect an external power supply 220V (electric cable 30m) (6,2 USD); outlet to connect equipment (3,1 USD); car refrigerator (61,5 USD). *Furniture and other special materials*: wardrobe with two compartments (76,9 USD); hanging closet for supplies (30,8 USD); pedestal tables with drawers (76,9 USD); shelving for storage of equipment and supplies (46,2 USD); folding table in the passenger compartment (15,4 USD); soap dispenser (1,5 USD); paper towel holder (3,1 USD); hair dyeing brush, combs, scissors (30,8 USD); special tools (hair dryer, curling irons) (107,7 USD); uniform (15,4 USD).

Appendix 2

Table. Current costs of setting up a mobile hairdressing unit in the first year of operation

Expenses components	Price per piece, USD	Annual cost, USD.
1. Supplies (hair dye, eyebrow dye, oxidizers, balms, foil and other supplies)	–	3 538,46
2. Labor expenses (3 pers.)	230,77 /month	8 307,69
3. Depreciation of vehicle	–	2 197,8
4. POL	–	2 020,77
5. Vehicle repair and maintenance	–	307,69
6. Taxes and charges (transport, UTII)	–	2 716,97
7. Other expenses	–	307,69
Total	–	19 397,07

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A PAZ 32053 bus – 130 horsepower at 3,200 rpm – is in the fourth depreciation group of 5 to 7 years. Transport tax is 40 USD, UTII is 168,04 USD. Contributions to non-budget funds amount to 2 508,92 USD. The standard fuel consumption of a PAZ 32053 at 60 km/h is 20 litres/100 km. The cost of 92 RON gasoline is, at the time of writing, 0,5 USD/litre.

Appendix 3

Auxiliary equipment and support systems include:

Water supply: water tank 50-80l (6,2 USD), stainless steel sink (10,8 USD); pump for the water supply 12V (15,4 USD); electric heater 15l (35,4-53,8 USD); canister for collecting used water 30l (6,2 USD).

Heating, ventilation and air conditioning: additional heater (284,6 USD) *Lighting*: strip lights 220V (2 pcs.) (3,69 USD). *Electricity supply*: diesel generator (876,92 USD); device to connect an external power supply 220V (electric cable 30 m) (6,15 USD); outlet to connect equipment (3,08 USD); car refrigerator (61,54 USD).

Furniture and other special materials: wardrobe with two compartments (76,92 USD); hanging closet for supplies (30,77 USD); pedestal tables with drawers (76,92 USD); shelving for storage of equipment and supplies (46,15 USD); folding table in the passenger compartment (17,5 USD); soap dispenser (3,08 USD); paper towel holder (3,08 USD); uniform (15,38 USD); other materials (yarn, fabric, scissors, screwdrivers, glue, etc.) (769,23 USD); special tools for shoe repair (538,46 USD).

Appendix 4

Table. Current costs of setting up a mobile unit of social and everyday purposes for repair in the first year of operation

Expenses components	Price breakdown, USD.	Annual costs, USD.
1. Materials (yarn, fabric, glue, etc.)	–	1 538,46
2. Labor expenses (3 pers.)	230,77 /month	8 307,69
3. Depreciation of vehicle	–	2 197,8
4. POL	–	2 104,04
5. Vehicle repair and maintenance	–	307,69
6. Taxes and charges (transport, UTII)	–	2 800,99
7. Other expenses	–	769,23
Total	–	18 025,9

Transport tax is 81,25 USD.
UTII is 252,07 USD.
Contributions to non-budget funds would amount to 2 508,92 USD.

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SUSTAINABLE ENTREPRENEURSHIP: AGRARIAN POLICY IN SOUTH KOREA

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Abstract. This paper focuses on the issues of sustainable entrepreneurship using an example of South Korea (also known as the Republic of Korea). Mainly, it is tackling the problem of preserving the vulnerable agricultural sector and its social structure according to South Korean general course for increasing the openness of the economy. We build upon the historical approach, economic and comparative analysis in order to classify and formulate the features of the South Korean agrarian model. Moreover, we analyze how this model is applied for the stages of the state agricultural policy, including the foreign trade component, domestic support measures for agriculture. Our results reveal the importance of the gradualness and flexibility of the transition to a market efficiency model with the active use of non-market methods and the preservation of selective protection of the domestic market from commodity imports. It becomes apparent that following the FAO approaches to the concept of food security, South Korea uses the policy of combining self-sufficiency and imports, increasingly diversifying the structure of consumed food products.

Keywords*:* agrarian policy; sustainability; entrepreneurship; cooperation; foreign trade; agricultural products; South Korea

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JEL Classifications: R5, Q1

1. Introduction

South Korea (also known as the Republic of Korea) has long been an example of well-functioning market forces and impeccable merge of sustainable development and entrepreneurial growth. One of the keys to its success is the agrarian policy that is worth of further studying, analyzing and adapting for other countries wherever it might be useful and relevant (Janda et al., 2013; Chamberlin, 2015; Abrham et al., 2015; Niño-Amézquita et al., 2017, Zemlickiene et al., 2017; Tvaronavičienė, Razminienė 2017; Skrypnyk et al., 2018, Suleymanova, 2009). The relevance of our paper is determined by our interest in the Asian mode of production in the context of studying the most traditional sphere of activity - agriculture in the transition period of economically developed countries to a new technological order and a dynamic change in the rules of operating in a foreign trade environment. Rapid industrialization and development of the service sector leads to a change in the structure of Korean GDP, not in

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favor of agriculture. This creates an impression of the insignificance of this field of activity, of its retreat into the background of the strategic priorities for the development of South Korea. Meanwhile, Koreans, who have survived the period of wars and occupation, trade blockade, hunger and poverty, are familiar with the geopolitical aspects of the country's food security. This makes South Korea both similar to some countries (such as for example Central and Eastern European countries (see e.g. Koudelková et al., 2015; Cieślik et al., 2016; Vojtovic, 2016; Vasylchak and Halachenko, 2016; Simionescu, 2016) and unique in its peculiarity and the way of life.

The natural factors of South Korea are such that historically the country is dominated by the land-saving technological method of agricultural production. Less than 20% of its land is arable (Korean Statistical Information Service, 2017). Industrialization and urbanization have intensified the problem of land shortages. In this regard, the most important development of agriculture in South Korea was initially the increase in land productivity, not the growth of labor productivity. Micro-farms are specific for the agro-sphere of this country: the average area of cultivated land per 1 worker is 1.4 hectares. By the value of this indicator, South Korea is between Japan and China, respectively, 3.4 and 0.3 hectares (Table 1). The number of employees per 100 hectares is 70 people, while in China the number is 395 people. In all the countries under consideration, especially in China, there are problems of agrarian overpopulation. The industry has relatively high capital intensity: in Korea, 9.5 thousand dollars of fixed assets account for 1 hectare, 7.6 - in China, and 53.2 thousand dollars in Japan. In the countries of classical labor saving this level is fundamentally different. For example, in Canada, the employee's assets stood at 317.8 thousand US dollars in 2013 (Rastyannikov and Deryugina, 2017) The level of labor productivity in South Korea is higher than China's average values: 25.1 and 1.2 thousand dollars per capita, but almost two times lower than in Japan - 46.5 thousand dollars. The productivity of land (for all crops), on the contrary, in the Republic of Korea has a higher value: 17.6 and 13.6 thousand dollars per hectare respectively.

Table 1. Indicators of agricultural production in Japan, South Korea and China, 2013

Indicators	Japan	**South Korea**	China
Workable area per 1 worker, hectare (ha)	3,4	**1,4**	0,3
Number of workers per 100 ha, people	29	**70**	395
Fixed assets for 1 worker, thousand dollars per capita*	182,3	**13,5**	1,9
Fixed assets per 1 ha, thousand dollars	53,2	**9,5**	7,6
Fertilizers per 1 ha, kg	236	**316**	484
Labor productivity, thousand dollars per capita*	46,5	**25,1**	1,2
Gross productivity per 1 ha, thousand dollars	13,6	**17,6**	5,0

Note: *in 2005 prices
Source: FAOSTAT, UNCTADSTAT (2017)

Initially, South Korea was formed as an agrarian country. The share of agriculture (including fisheries and forestry) in GDP exceeded 30%. The share of employed in this sphere is more than half of all employees, and not less than 80% if employed in related industries are included. Industrialization, and then outstripping the growth of services, radically changed the economic structure of the country of morning freshness. By 2017, the share of agriculture has fallen to 2.2%, the share of employed – up to 5% (10 times) (World Bank and OECD National Accounts data, 2017), see Figure 1.

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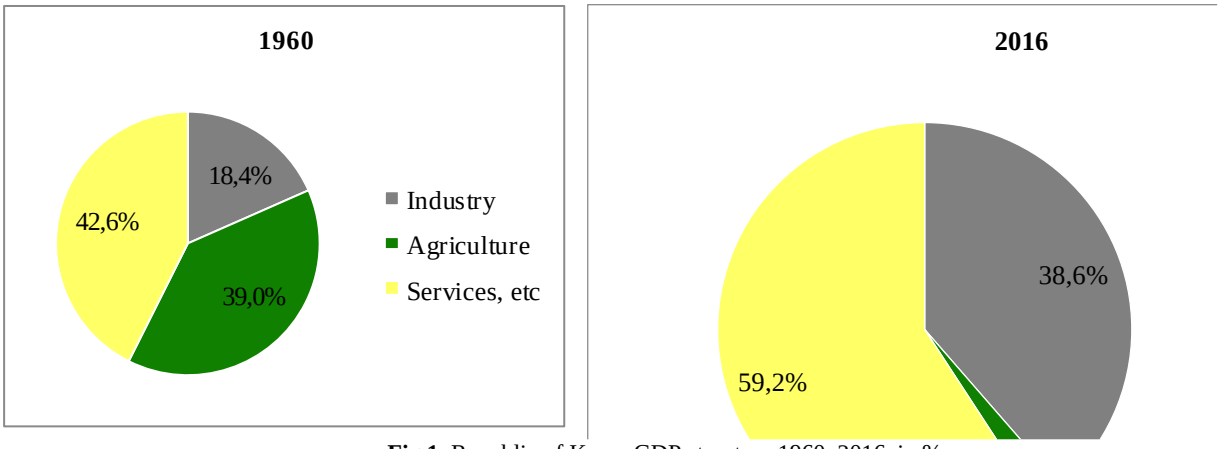


Fig.1. Republic of Korea GDP structure 1960, 2016, in %
Source: World Bank and OECD (2017)

Reduction of relative indicators was accompanied by a significant increase in absolute ones. In particular, the volume of agricultural production increased from 1.433 billion US dollars in 1950 to 28.153 billion dollars in 2017 (World Bank, 2017; OECD, 2017). On the productivity of rice, South Korea is in the top 10 countries of the world, ahead of Japan and China (Figure 2). The forecast of the productivity of rice grown in South Korea depends to a large extent on possible climate changes and related solutions to irrigation problems (Yoon and Choi, 2017).

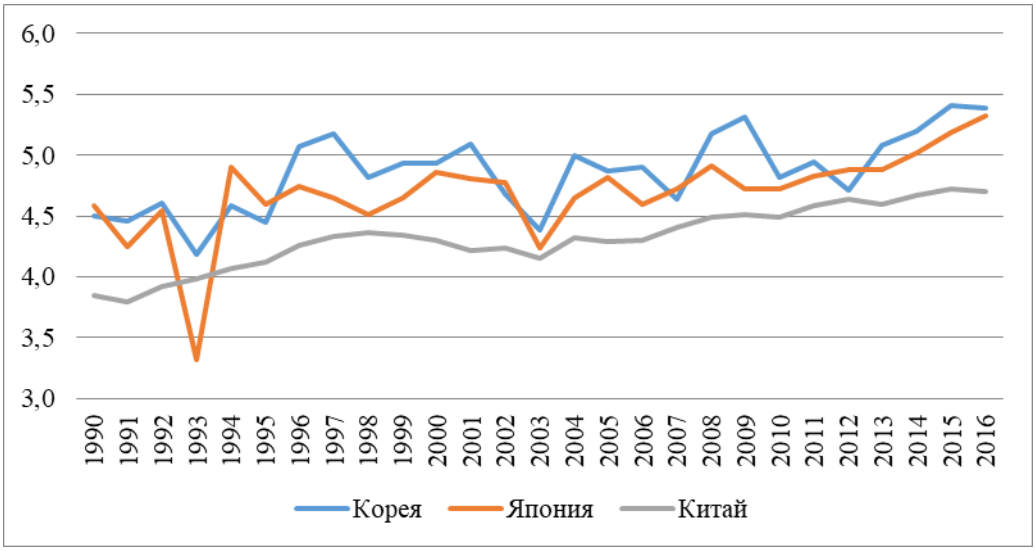


Fig. 2. Rice yields, ton / ha
Source: OECD-FAO Agricultural Outlook 1990-2027

The social and economic importance of the agrarian sphere is measured not only by quantitative, but also by qualitative indicators (see e.g. Chiabai et al., 2014; Jiroudková et al., 2015; Ehrenberger et al., 2015; Vojtovic, 2016; Simionescu et al., 2016). The multifunctionality of agriculture predetermines the constant focus of the state on this sphere of activity.

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2. Agrarian policy transformation in South Korea

It is important to consider the transformation of the agrarian policy of South Korea, including its foreign trade component. In the 1950s and 1960s, the legal framework for reforming agriculture was being created. According to The Farmland Reform Act of 1949 and The Basic Agricultural Law (1967), the central link in the transformation was the redistribution of agricultural land in favor of self-employed farmers (the principle of self-tilling). To prevent the accumulation of agricultural land in the hands of speculators, the purchase of land with an area of more than 3 hectares by non-agricultural entities was limited.

The world energy crisis of the 1970s, connected with the growth of world prices for oil imported by the Republic of Korea, negatively affected the financial state of agriculture. A number of measures are implemented to increase the incomes of those employed in agriculture. In particular, the system of public procurement of rice operates at prices higher than market prices (including world prices); farmers are subsidized. The expansion of farm households is supported due to reclamation and land restoration. A policy is being pursued for the co-operation of small family farms, the creation of local processing cooperative and private industries, and rural infrastructure.

From 1986 to 1997, the problem of increasing land prices was solved, which overtook the growth in the efficiency of agricultural production and constituted a constraint on the consolidation of land. In this context, the Law on Regulation of Land Plots Lease (1986) is adopted. The limit of land ownership was raised to 10 hectares. Conditions for the acquisition of agricultural land have been simplified. The term "agricultural development zone" is introduced. The growth of agricultural production is accompanied by an increase in government spending 1 centner of output on subsidizing. The accumulation of deficits forces to change the policy of state support to farmers. In 1986, with South Korea joining the WTO, the period of "soft" liberalization of the Korean agricultural market continued. Structural reforms in agriculture aimed at diversifying cultivated crops and increasing the marketability of farms. In 1996, the Farmland Act was adopted, which became the basic legal document regulating agricultural activities.

In the period of 1998 - 2017, a number of external events influenced the state policy of the Republic of Korea. In 1998, South Korea was involved in the Asian financial crisis. It caused a significant devaluation of the national currency, a series of bankruptcies on the Korean Stock Exchange (KSE), a decline in GDP in general and in the agricultural sector in particular. The way out of the crisis is connected with obtaining loans from the IMF. In 2008, the economy of South Korea sank under the impact of the global financial crisis.

Within the framework of the export-oriented model of South Korean economy development, imports dominate in the foreign trade turnover of agricultural products that correspond to the trends of China and Japan (Figure 3). The values of the foreign trade balance of this group of goods are in the negative zone. In South Korea, the excess of imports over exports tends to increase comparing to the data of the 1980s and 1990s.

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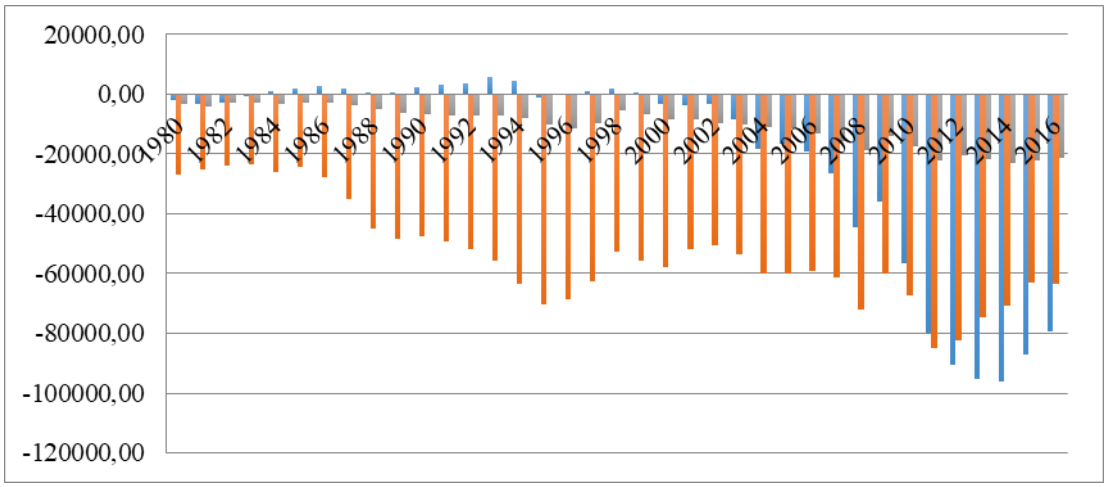


Fig. 3. Export and import balance of agricultural products, millions USD (in current prices)
Source: WTO Statistics Database (2017)

The export of Korean agro products is limited by the relatively high level of state support for the domestic producer, especially the rice farmers' households. Agrarian reform in recent years is aimed at reducing the overall support to agriculture (TSE) of South Korea in percentage of GDP: from 8.6% in 1986-1988 to 1.7% in 2014-2016 (Figure 4).

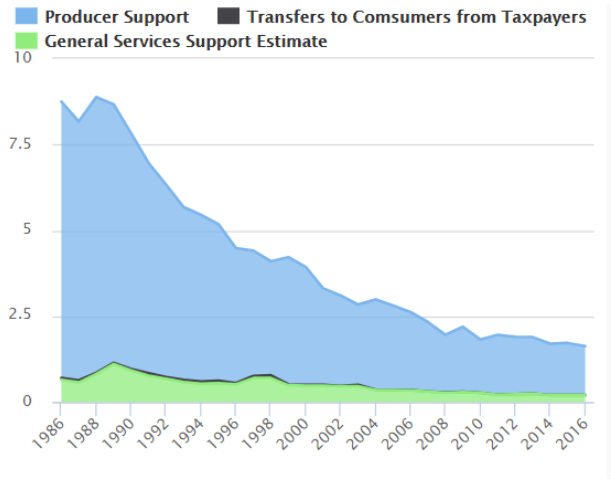


Fig. 4. Korea's Total Support Estimate, % of GDP
Source: OECD (2017)

However, at 49% producer support expressed as a share of gross farm receipts (% PSE) is still 2.5 times higher than the OECD average. The market price support (MPS) has been the dominant element in the support to farmers. Even though the ratio of producer price to border price has declined from 3.3 in 1986-88 to 1.9 in 2014-16, the share of the MPS in the PSE shows only a very moderate decrease from 99% to 92% for the same period. The transfer to individual farmers represents 87.4% of the TSE, while support to general services (GSSE) takes up 12.5% of the TSE. The expenditure on the development and maintenance of infrastructure accounts for 52% of

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the GSSE, followed by the agricultural knowledge and innovation system. For South Korea (the same as for Japan), state support for the development of agriculture is combined with the support of rural residents and rural settlements, which brings together the strategies for modernizing the village of the two Asian countries (Xin, S., Chaoyang, S., Mo, L., 2017).

In the Republic of Korea, the agrarian reforms are implemented against the backdrop of increased participation of the South Korea in the regional integration of countries in the format of free trade zones (FTAs). By 2017, South Korea has signed sixteen free trade agreements, which cover more than 70% of its exports. Meanwhile, South Korean agriculture has relatively low competitiveness. Mutual opening of borders creates significant risks for Korean farmers. During the ratification process of the Korea-Chile FTA in 2004, a Law for Implementing Free Trade Agreement established a W 2.1 trillion fund to compensate some retiring fruit producers (of grapes, kiwis, peaches) who affected by the Korea-Chile FTA, had to close their farms, as well as to enhance competitiveness so as to enable the fruit industry to respond rapidly to the changes in consumption patterns. Between 2004 and 2007, W 698.8 billion was disbursed, of which W 642.2 billion (53.5% of total fund) was used).

The impact of accession to the FTA on agriculture is the subject of research by a number of authors in South Korea (see e.g. Jeong et al., 2017). In March 2012, the Free Trade Agreement between the United States of America and the Republic of Korea (KORUSFTA) entered into force, which fits into the strategy of "rebalancing" U.S. forces in favor of strengthening its influence in the ATR zone. For more details on the policy of "rebalancing" (see Manyin et al., 2012). Negotiations were long, partially because of the tough position of the U.S. regarding the liberalization of the Korean agrarian market. In 2007, the average customs tariff for imported agricultural products in the Republic of Korea was 49% or about 4 times higher than in the U.S. (Country Profile for Republic of Korea, 2017). In the search for mutual compromises, rice was removed from the obligations of South Korea to liberalize the agrarian market. In turn, the US side insisted on lifting the ban on beef import to South Korea, introduced by Seoul in December 2003 to defeat spongiform encephalopathy virus. The skeptical attitude of the new US President D. Trump to the regional institutions was reflected in his assessment of the results of the KORUS agreement. In particular, in September 2017 D. Trump resumed attacks on a bilateral FTA with South Korea, considering it to be disadvantageous for the United States (U.S. policy in East Asia during the administration of Donald Trump, 2017).

On June 1, 2017, the People's Republic of China and the Republic of Korea signed an agreement on free trade. That will lead to an increase in mutual trade turnover, including agricultural products, and to the gradual involvement of the Korean economy into the yuan zone. The free trade zone (FTA) between the Eurasian Economic Union and South Korea will be created mostly for mutual investments in the economies of countries. The new regime will not work until 2019 (Grigoryeva, 2017).

Despite the government costs associated with farming in the FTA, South Korea remains committed to the values of multifunctional agriculture. We support the position of authors (Lee et al., 2017) about impossibility to introduce this sphere of activity into the framework of purely market relations in the future. The strategic direction of the agricultural policy is to improve the quality of rural life by developing social security for rural people, expanding social farming, creating jobs in rural areas, developing infrastructure and aesthetics of landscapes, decentralizing governance by strengthening the role of rural communities, introducing safe innovations of the new technological order into rural business, expansion of international, including inter-Korean, cooperation in the agrosphere. With regard to the above, the tendency to move people from the city to the countryside is interesting, because of a decrease in GDP growth rates and an increase in the craving for life in an environmentally clean territory. In addition, rural tourism is developing in the Republic of Korea. For example, MAFRA (The Ministry of Agriculture, Food and Rural Affairs) developed and launched a program of study tours for foreign tourists, including visits to farms and rural settlements, local markets, picturesque rural places to get acquainted with the

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traditional Korean culture. The tour program is linked to the 2018 Winter Olympic Games (Mafra, 2017). Some areas of the modern agrarian reforms of the Republic of Korea will be described later in this paper.

3. Transformation of business units of agricultural production

The main business units in agriculture in South Korea are family farms, farmers' cooperatives and cooperative associations. The Agriculture and Rural Communities Basic Act (1998) defines the owner of the farm as an entrepreneur if it meets one of the following criteria: it processes more than 1000 m2 of farmland; annual sales of agricultural products is more than 1 million Korean wons; engaged in agricultural activities more than 90 days a year.

Since 1970, there has been a process of reducing the number of farms and increasing the land plot for one farm. The differentiation of family farms in terms of land area and income has increased. The share of relatively large family farms of more than 3 hectares increased from 4.7% in the total number of farms to 8.7% in 2014. The share of small plots with an area of less than 0.5 hectares increased, respectively from 30.4% to 42.9 %. On the contrary, the share of plots with area from 1 to 2 hectares decreased significantly from 27.9% to 18.5%. It was these areas that became the base of growth for the other two groups. This process is directly related to the change in the share of leased agricultural land in the total volume of cultivated land: from 17.8% in 1970 to 50.0% in 2013 ("Agricultural Resources and Structure, Agriculture in Korea", n.d.). A large part of the leased agricultural land belongs to non-farmers.

Reproduction of the farmer's family is the most important element of sustainable development of the Korean agriculture. In this sense, the aging of the rural population, the imbalance in sex and age, the lack of a successor in many households remain a serious problem, mainly because of the outflow of youth to the city. The aging of the population, in addition to the deterioration in the quality of the labor force, raises the issue of a flexible retirement schedule and the creation of an acceptable pension system for older farmers. The direction of the migration flow is related to the increase in the income gap between urban and rural residents. Until the middle of the 1990s, the incomes of farmers accounted for 90% of the incomes of the townspeople, in 2016 – 63.5%. Changes in the structure of incomes of farm households are characterized by the predominance of non-agricultural incomes. So, as of 2016, the income from agriculture was only 27.1%, and non-agricultural incomes and transfers – 41.0% and 23.6% respectively. Differentiation of farm income is associated with high inequality in non-agricultural income, which is especially important for elderly farmers (Woo, B., Lim, S., Lee, D., Lee, H., Han, B., November 30, 2017).

The key to successful reform of agriculture is in the transformation of business units of agricultural production. Overcoming the limitations of a self-sufficient growth model and ensuring market competitiveness of family farms is done through their voluntary and multilateral cooperation. The role of mutual lending is especially high. Cooperation in this area allowed overcoming the enslaving conditions for financing peasants and significantly expanding the opportunities for agribusiness (Nikolaeva, 2014). The integration of the financial market and the development of Internet banking created preconditions for banking operations on a national scale through the system of the National Agricultural Cooperative Federation (NACF) (Kotova, 2014). There has been a trend to include farm households and their cooperatives in larger production organizations and corporate systems. It is caused by a reduction in the advantages of manual labor of the family farm under conditions of mechanization and automation; the need for managerial skills and flexible marketing strategies in an environment of volatile business conditions. The farmer should focus on creating added value in agriculture. He is surrounded by service organizations and business structures that support the production process and sales of products. "Agricultural sectoral clusters" are being formed, which include related industries, universities and research institutes, local government. With the support of the state, local distribution and shipping organizations are set up for joint

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storage, processing, transportation, sale of farm household goods. NACF forms a marketing system, including product branding.

4. State regulation of agricultural production

Currently, the conjuncture of the domestic rice market is characterized by excess of supply over demand. For this basic culture, complete self-sufficiency was achieved by the end of the 1990s (Table 2 that follows).

Table 2. Ratio of Food Self-Sufficiency in Korea (Overall), %

Years	Average	Rice	Barley	Wheat	Corn	Soybean	Potatoes	Others
1995	29.1	91.4	67	0.3	1.1	9.9	98.4	3.8
2000	29.7	102.9	46.9	0.1	0.9	6.4	99.3	5.2
2005	29.4	102	60	0.2	0.9	9.7	98.6	10.0
2010	26.7	104.6	26.6	0.8	0.8	8.7	98.7	7.8

Source: APIP-APEC (2018)

The level of food consumption of rice per capita in South Korea has reached its medical standard (Figure 5). Further, based on the growth in income of the Korean population, there is an almost twofold decrease in consumption of this product from 119.3 kg per capita in 1990 to 61.6 kg in 2016, and approaching the level of consumption in Japan. There is a process of diversification and westernization of the diet of Koreans. The consumption of meat and meat products, vegetables and fruits is increasing (Figure 5).

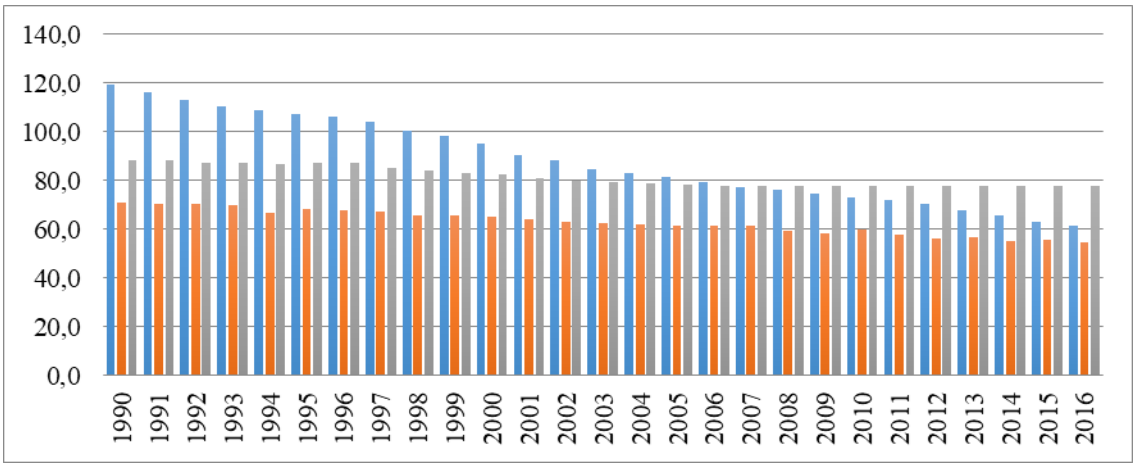


Fig. 5. Consumption of rice per capita, kg
Source: OECD-FAO Agricultural Outlook 1990-2027

Based on the described above, rice production was stabilized with a gradual decrease in the area of land allocated for sowing this grain crop (Figure 6).

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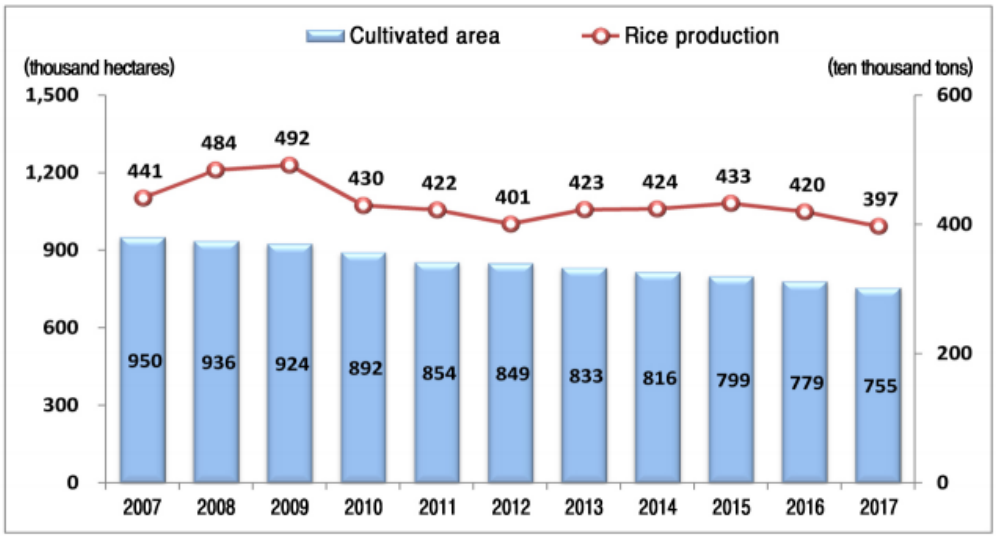


Fig. 6. Rice production in 2017
Source: Statistics Korea (2018)

For a long time, the domestic rice market was closed for import. As self-sufficiency is achieved, market access is being opened, but the quota system continues to operate, despite the charging procedures for other agricultural products. In terms of WTO membership, the RoK has postponed the reduction in import tariffs for rice and retained limited access to the domestic market between 1995 and 2004 through the quota mechanism: 1-4 % of the base year (1988-1990) of consumption at 5 % tariff rate. Since 1995, rice imports have increased from 121,600 tons to 305,700 tons in 2015 (OECD-FAO Agricultural Outlook 1990-2027, 2017). Deliveries were mainly from the PRC, as well as from the US, Thailand and some other countries. During the negotiations on rice issues with rice importing countries, the RoK has committed to expand the quota from 4% to 7.966% of domestic consumption, provided that the tariff reduction will be delayed for 10 years. The import procedure included a tender for public procurement, with reference to the import quotas of each supplier country. Since January 2015, the Republic of Korea has replaced non-tariff measures to regulate access to the domestic rice market at a tariff rate of 513%. The minimum tariff quota of 408.7 tons of imported rice is supported by a tariff rate of 5%. (Producer and Consumer Support Estimates database, 2017).

In the administration of the fullness of quotas, the role of the state is great not only in South Korea but also in Japan. At the same time, commercial considerations and the transparency of quota coverage are of concern (Choi and Sumner, 2000). In general, after joining the WTO, the amount of rice imported into the South Korea increased significantly. The balance of commodity turnover of rice (in physical terms), since 2006 has been steadily negative (Figure 7). According to OECD-FAO Agricultural Outlook 1990-2027, the excess of rice imports in South Korea over its exports amounted to 478 thousand tons. (2016) and is comparable to the magnitude of the balance in Japan.

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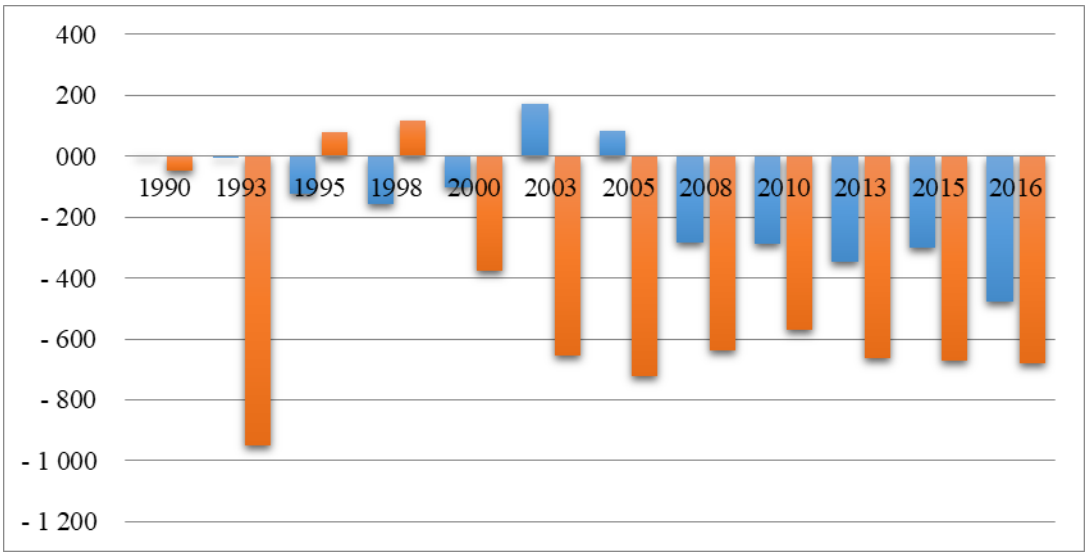


Fig. 7. Export and import balance of rice, thousand tons
Source: OECD-FAO Agricultural Outlook 1990-2027

Since the foundation of the country until the first half of the 1990s, the government had encouraged the cultivation of rice in order to achieve self-sufficiency. Stimulation was carried out mainly due to high purchasing prices for rice, which exceeded the market level. The state purchased from 22 to 30% of the total domestic production. After joining the WTO in 1995 and overproduction of rice, the government intends to reduce domestic subsidies. In accordance with the five-year plan for 2016-2020 measures are planned for balancing supply and demand. These include the reduction of rice paddy fields, the promotion of diversification of cultivated crops, the use of high-quality seeds, the use of the mechanism of government intervention, the development of the Korean National Food Cluster focused on exports (Foodpolis). The cultivation of environmentally friendly rice, free of pesticides, and the non-use of GMO seeds were emphasized.

5. Sustainability of agricultural production

Since 1994, the legal framework for the development of ecologically clean agriculture has been formed in South Korea. The system of direct payments for the introduction of environmentally friendly farming practices was introduced in 1999. Minimization of the use of chemicals and the processing of livestock farm waste are encouraged. According to the data of the Korea Rural Economic Institute (KREI), about 30% of cereals are currently certified (without pesticides). Direct payments per 1 hectare are made for the production of an organic product; product grown without the use of pesticides and with low pesticide content. There is a program to combat pests of agricultural products based on the use of natural enemies (biological control of pests). Farms that use organic fertilizers are supported, as well as stores that sell environmentally friendly products (EFP). Financing is carried out from the federal and local budgets. Economic measures to stimulate EFPs include subsidies, regulations and environmental taxes. State ecological programs for the development of agricultural zones, cultivation of water-purifying crops, such as lotus, are being implemented. Environmental management in rural communities is purposefully developing. However, the level of ecologization of agricultural production in South Korea is insufficient. In the country it is forbidden to grow GMOs of plants and animals, but their import is allowed. The report on monitoring the environmental impact of the GMO (National Institute of Ecology, NIE) showed that in 2013 GM maize and cotton were found throughout the country. The danger of mixing and germinating GMO seeds, their possible harmful effects on the ecosystem and poor control over GMO products raises serious concerns for both farmers and consumers (Choi, 2015).

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6. Conclusions and discussions

In a generalized form, the main features and trends in the development of the agricultural sector of the Republic of Korea can be reduced to the following statements. There is an essential role of the state, which is developing agricultural strategies for the five-year plans, and local self-government bodies. Reforms of agriculture, taking into account the level of development achieved and the priority of preserving the fragile social structure of rural areas are flexible and gradual. Constant direct and indirect support of the domestic producer is done with a gradual shift in the emphasis of support: a shift from direct to indirect payments, from measures of the "yellow basket" to measures of the "green basket", which according to WTO rules do not require a reduction. Selective protectionism is applied with preservation of domestic rice market protection, which remains the basic culture of Korean plant growing. Reaching self-reliance in rice consumption and increasing self-sufficiency in a number of other grain and grain-bean crops is carried out along with the expansion of rice exports and imports of forage crops to develop the forage base of Korean livestock.

The main economic entities of Korean agribusiness are small family farms, united into multifunctional cooperatives of different levels, as well as cooperative associations integrated into the National Association of Agricultural Cooperatives (NAAC), supported by the state. The role of loans coming through the NAAC system to primary farm households is very significant. The most important trends in the development of agriculture in South Korea are: the enlargement of the area of a land plot that is farmed by one farm household, including through leasing, with a reduction in the number of family farms and the growth in their fund-raising ratio; segregation of industries using intensive technologies, environmentally friendly technologies and organic production. There is a decrease in the share of the land occupied by rice, in favor of growing other crops, vegetables (including indoor soil), fruits, as well as livestock development. The above-mentioned peculiarities made it possible to combine modern European technologies of production, storage, transportation, processing, sale of agricultural products with the traditional social structure of Korean rural communities and settlements.

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TOWARDS SUSTAINABILITY: ALLOWANCE RIGHTS FOR USING WATER RESOURCES IN AMAZONAS STATE OF BRAZIL*

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Abstract. The water use permit is one of the instruments of the National and State Policy of Water Resources in Brazil through which the government authorizes the user to withdraw water or to make hydraulic interferences in water bodies necessary for their activities, guaranteeing the right of access to these resources. In the state of Amazonas, the Water Resources Policy (PERH) was reformulated by Law 3,167 of 2007, which latter was regulated by decree 28,678 of 2009, and use permit started to being issued in 2017. The objective of this paper is to contextualize the current situation of this instrument, based on bibliographical review and on the observed practical consequences. The State Water Resources Policy (PERH) exists since 2001, but the implementation of the water use permits issuance in the state has not progressed significantly over the last 15 years. Important advances occurred only in 2016 and 2017, with the establishment of technical parameters for water use. Permits slowly started to be issued in 2017, but still disconnected from the other instruments of the Brazilian Water Resources Policy.

Keywords: sustainability; allowance right; Amazonas; water resources; environmental legislation

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JEL Classifications: Q25; Q28

Additional disciplines: law

1. Introduction

The Brazilian Federal Decree 24,643 published in 1934 was the first law to directly pay aim at water resources in Brazil. The so called "Water Code" had as main objective the public control of the rivers for the use of the hydroelectric potential (Couceiro & Hamada, 2011). The 1988 Constitution brought significant elements to the current management of water resources in the country. It established that the Brazilian Federal Government owns all lakes, rivers and any watercourses that occupy its domain, in addition to those crossing more than one state, serving as boundaries with other countries, and extending to or from foreign territories. Each State, and the Federal District Brasília, owns all surface water or groundwater that flows, emerges or is deposited within its territory only, except for water bodies in which the Federal Government has any related construction activity (Ana, 2011).

Law 9,433 (Brazil, 1977) created legal and institutional instruments for the management of water resources, thus creating the National Water Resources Policy (PNRH), complementing the Water Code. It considers water as a public natural resource that possesses economic value. The PNRH aims at ensuring good quality water availability for current and future generations. It also aims at assuring its rational and integrated use, including waterway transport, giving support for a sustainable development, prevent and defend against critical hydrological events, natural or human driven (Couceiro & Hamada, 2011).

The water use water use permit right is one of the instruments of the "National and State Water Resources Policy" through which the public administration, under pre-established conditions, authorizes the user to draw water or make changes in water bodies (Vatn, 2010). This guarantees the right of access to these resources to all citizens and companies, since water in Brazil is publicly owned. This instrument aims to ensure public access to water in adequate quantity and with the necessary quality (Brasil, 1997), as well as to guarantee the ecological services of water (Amazonas, 2007).

In the state of Amazonas, the water resources policy law was created in 2001 by state law 2,712, amended by law 2,940 of 2004 and reformulated by law 3,167 of 2007. The latter was regulated by decree 28,678 of 2009 and the

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permit right uses implemented in 2017. Criteria were established through resolutions of the Conselho Estadual de Recursos Hídricos (State Water Resources Council - CERH) in 2016. Procedures were defined by normative norms of Amazonas Institute for Environmental Protection (IPAAM) and Secretary of Environment of the Amazonas state (SEMA). However, which are constantly undergoing changes.

The objective of this article is to contextualize the current situation of this instrument of the National Water Resources Policy in the state of Amazonas, based on regulated regulations and the implementation of the instrument. Section two shows a theoretical framework of the National and State Water Resources Policy dealing with surface water, ground water, effluent release, hydroelectric potential and water quality/quantity. Section three shows the methodological procedure to gather all information. Finally, the fourth section presents and discusses all information available in the bureaucratic government law water regulation.

2. A theoretical framework

For the implementation of the water use permit, it is necessary to integrate this with the other PNRH instruments. Consideration should be given to the priorities established in the water resources plans, as well as rationalization targets and propositions of areas subject to restrictions of use. According to Nascimento (2012), another instrument is the classification of water bodies into classes, where the main purposes of this instrument are: to ensure compatible quality according to their destination and prevailing use, as well as to reduce the costs of fighting pollution. It is an essential instrument when the purpose of the water use permit is to dilute effluents. The Water Resources Information System shall store information relevant to the analysis of the water use permits applications and shall contain information on the authorized demands in the river basins of the country. For an efficient collection, it is very important that there is a proper and comprehensive database and water use permit database system (Pagiola 2007; Ana, 2011).

Among the uses that are subject to water use permits, according to the National Policy of Water Resources, are:

I - Derivation or capture of a portion of the water existing in a body of water for final consumption, including public supply, or production process input;
II – Groundwater extraction for final consumption or production process input;
III - Launching of sewage and other liquid or gaseous waste, treated or not, with the purpose of their dilution, transportation or final disposal;
IV - Use of hydroelectric potential;
V - Other uses that alter the regime, quantity or quality of water in a body of water.

The studies required to support the application for a water use permit should be under the technical responsibility of a professional qualified by the Regional Council of Engineering and Agronomy (CREA). Regardless of the type of interference, the minimum information present in a water use permit is the identification of the applicant; exact site location, including the name of the water body and the main river basin to which it belongs; and specification of the purpose of water use (Nascimento, 2012).

Surface water

The amount of water that can be extracted from a surface water body has to be determined based on the minimum reference flow, for a river or stream, or on the volume of water stored, in a lake or a reservoir. The first one uses long-term flow data and establishes reference flow values using methods such as Q_{90} Q_{95} and $Q_{7,10}$. The Q_{90} is the flow determined by measurements performed in a given period of time in which, during 90% of it, the flow is greater than that value, that period the flows are equal to or greater than it. The Q_{95} is the flow of 95% permanence. The $Q_{7,10}$ is the lowest consecutive average flow of seven days that would occur with a return period of 10 years.

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In the case of water extraction from reservoirs, the main objective is to divide the regularized flow to the users of its surrounding (Ana, 2011). Generally, this flow is obtained through traditional flow regionalization methods, flow proportionality and mass conservation (Moreira, 2014). The user has to provide the extraction information necessary for the request evaluation: maximum instantaneous flow and daily volume to be derived; pumping regime variation, in terms of hours per day and days per month (Nascimento, 2012). This can be summarized as interference conditions.

Groundwater

Requesting a permit for groundwater use begins with asking for an authorization to drill a well, indicating the drilling location, the discharge estimate and the type of aquifer to be tapped. The state environmental agency then, verifies the existence of other wells that can be affected by the new drilling, and possible negative effects on surface water bodies. Extraction rates are determined by pumping tests and aquifer recharge evaluation. The outflow should be sustainable in order to avoid overexploitation (Ana, 2011).

Just as for surface water, the interference conditions have to be informed, including at least: maximum instantaneous and daily discharge; pumping regime variation, in terms of hours per day and days per month (Nascimento, 2012).

Effluent release for dilution purpose

The use of water bodies to dilute liquid effluents has to be done considering the original water quality class of this body. The changes caused by the effluents should not be so large as to change the class. Federal regulations determine that temperature and biochemical oxygen demand (BOD) have to be used as quality references. In places subject to eutrophication (such as natural and artificial lakes), phosphorus and nitrogen are included (Ana, 2011). However, in the other cases in the country, there is no uniformity of criteria for the analysis of grant applications (Zandonadi, Mendonça, & Reis, 2015; Akhmetshin et al., 2017). Applications to using water bodies for effluent dilution purposes have to indicate instantaneous maximum flow and daily effluent volume to be released; flow rate variations; physical, chemical and biological pollutant concentrations and loads (Nascimento, 2012).

Use of hydroelectric potential

The use of hydro-electrical potential has to be requested by the National Electric Energy Agency (ANEEL) to the National Water Agency (ANA) or the state water agency, who then issues a document called *Declaração de Reserva de Disponibilidade Hídrica* (Water Availability Reserve Declaration - DRDH). If the required use is authorized, this request is turned into a water use permit, valid for a period of time defined in the initial request. The whole process has to be backed by studies on the impacts caused by the construction itself, by the dam on the hydrology and on the multiple uses of the water (Ana, 2011).

Other uses that impact water quality and quantity

Other ways of using these resources are subject to water use permits: a) urban drainage; b) channeling and/or rectification of watercourse; c) diversion of watercourse; d) small dams that are disconnected from catchments, with purposes such as leisure, landscaping and others; e) reservoirs for river flow regulation; f) water course watercourse for cleaning or mining; g) watercourse crossing by bridges, culverts and wet passages; h) other uses. However, most of these changes are small in size, and have little impact on the water body. In theses cases, water use permits are not required (Ana, 2011).

Due to the peculiarities of some states of the Brazilian northern region (Iorio et al, 2018), such as Amazonas, Amapá and Pará, other uses of the water subject to the concession were added. One can mention the use of

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waterways for transportation. Amazonas State law also adds non-consumptive uses involving exploitation of water resources by individuals, for commercial purposes, including recreation and bathing (Ana, 2011). Non-consumptive uses are those that do not cause flow rate changes, but which may impose restrictions on other uses, consumptive or not (Ana, 2011).

After 14 years of PNRH's existence, only three states in northern Brazil are developing management plans for their hydrgraphic basins, covering only a small proportion of their territories (Couceiro & Hamada, 2011). The Northern States of the Country that developed their *Política Estadual de Recursos Hídricos* (State Policy on Water Resources - PERH) are: Amazonas - Law 2,712 (Amazonas 2001), modified by Law 2,940 (Amazonas 2004), Amapá - Law 686 (Amapá 2002), Acre - Law 255 (Acre 2002), Rondônia - Law 1,500 (Rondônia 2003). However, in general, it is considered that almost nothing was done in these States aiming at the effective management of Water Resources (Couceiro & Hamada, 2011).

3. Methodological procedures

This study was carried out based on bibliographic research in the federal and state legislation related to water resources, resolutions of the State Council of Water Resources, ordinances of the Institute of Environmental Protection of Amazonas (IPAAM) and State Secretariat of Environment (SEMA, former SDS), publications of the National Water Agency (ANA), articles published in periodicals such as Oecologia Australis, Revista Brasileira de Recursos Hídricos (RBRH), Revista Ambiente & Água (A & A) and other related topics.

4. Results and Discussion

In the state of Amazonas, the first law that regulated the “State Policy for Water Resources” and established the state system for the management of water resources was the state law 2,712, dated December 28, 2001, which was amended by state law 2,940, dated December 30, 2004. During the validity of these laws, the issuance of water use permits was never implemented. In 2007, state policy and the water resources management system were reformulated by state law 3,167 of August 27, 2007, was regulated by state decree 28,678 of June 16 of 2009. However, the water use permits were only implemented in 2017, 16 years after law 2,712 was issued.

Among the various types of uses of water resources that may be allowed, some were defined by the national policy: a) derivation or capture of a portion of the water; b) discharge into water bodies; c) use of hydroelectric potential and d) other uses that alter the regime, quantity or quality of water in a body of water (Brasil, 1997). The state policy of Amazonas adds the use of waterways for transportation and also uses of water resources for commercial purposes of recreational and bathing nature (Amazonas, 2007). In the state decree 28.678 of 2009, many purposes are specified for the use of water subject to the concession as industrial supply, urban supply, irrigation, rural supply, other waterworks such as irrigation reservoirs, water mains, riverbed protection repairs, desilting services, landscaping, aquaculture, construction of sanitation works, crossings of water bodies with bridges and pipelines and other activities that are subject to evaluation by the competent instance. Many of these specifications are framed at the federal scope, such as water uses that alter the hydrologic regime, water quality or quantity.

Small water uses can have the necessity of requesting a permit waived. The uses for which it is unnecessary to request water use permits, are: a) accumulations, derivations, abstractions and launches considered insignificant, and b) use of water resources to satisfy the needs of small populations distributed in rural areas (Brasil, 1997). There are also the uses for the satisfaction of the needs of individual character and still small urban population nuclei (Amazonas, 2007). The state decree also gives permit exemption when the use of water is destined to human consumption, domestic or livestock water use. Low water extraction rates can also be exempt of permit

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requests. In the case of the state of Amazonas, CERH Resolution No. 02 of 2016 establishes the criteria for insignificant uses. Nevertheless, the well have to be registered, as defined in regulation (Sds / Ipaam, 2005) and inspected in the public interest and for the conciliation of conflicts, whenever insignificant derivations may interfere with each other (Amazonas, 2007).

All water use permits are subordinated to the Planos de Recursos Hídricos (Water Resources Plans - PRH), water frameworks, maintenance of adequate conditions for water transportation and should preserve multiple uses (Brasil, 1997; Amazonas, 2007 and 2009). However, the state of Amazonas does not have other instruments to discipline the permits, since its PRH hasn't yet been created. In 2016, by resolution 01 of CERH (June 19, 2016), technical criteria were established to be used by IPAAM in the analysis water use permit requests in the state of Amazonas. In accordance with the state decree 28,678 of 2009, IPAAM, obeying the technical criteria established in the ordinance of this Institute, will grant the permits on a precarious basis, for a maximum term of five years, renewable or not, until the approval of the Amazonas State PRH, which is currently being contracted (Ana, 2016). After PRH's approval, the permit may be given for up to 25 years, according to a decree that regulates the State Policy on Water Resources (Amazonas, 2009). In other words, the right to use water resources is not definitive, and can be suspended or terminated in cases of non-compliance with previously established conditions, absence of use or to guarantee more important uses.

The state law requests that permit holders make hydrometric, limnological and hydrogeological monitoring of the exploited waters. Penalties apply in case of noncompliance with any of the conditions (Amazonas, 2007). Monitoring data has to be sent to the *Instituto de Proteção Ambiental do Amazonas* (Institute of Environmental Protection of Amazonas - IPAAM), in the form recommended in the water use permit, based on normative instruction of the State Secretariat of Environment (Amazonas, 2009).

In the State of Amazonas, water use permits for both surface and groundwater rea issued by IPAAM, which uses the following laws and therein defined criteria:

Groundwater

Both law 3,167 of 2007 and decree 28,678 of 2009 deal specifically with groundwater, but the first one is more detailed:

The Executive Branch may establish protection areas, restrict the flow of wells, establish minimum distances between them, and take other measures required case by by case. Abandoned or functioning wells which are causing pollution or represent a risk to the aquifer, as well as drillings performed for purposes other than water collection, shall be adequately sealed in order to avoid accidents, contamination or pollution of the aquifer. The execution and operation of wells for groundwater extraction will depend on prior environmental licensing, in the manner provided in the Regulation, without prejudice to the allowance right for using water, in accordance with this law. The set up of industrial districts and irrigation projects, colonization or others that depend on the use of groundwater or that may impact on them should be preceded by hydro geological studies to evaluate the potential of their water reserves. Therefore, it will establish a correct sizing of the flows to be extracted, subject to the prior approval of them to the norms of this law and to the others that may be established by the State Council of Water Resources. Hydrogeological studies, projects, and well construction, as well as their operation and maintenance, shall be carried out by professionals, companies or institutions certified by the Regional Council of Engineering, Architecture, and Agronomy of the State of Amazonas (Amazonas, 2007).

In 2005, by means of ordinance SDS/IPAAM n°, 01 the Standard Regulation for drilling deep wells and other underground captures of water resources was approved. After the conclusion of a technical cooperation agreement between IPAAM and the *Serviço Geológico do Brasil* (Brazilian Geological Survey – CPRM), these data were used to supply the *Sistema de Informação de Águas Subterrâneas* (Groundwater Information System – SIAGAS).

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According to SIAGAS, there are 8,525 wells in the state of Amazonas (Cprm, 2017). However, other estimates indicate the existence of more than 10,000 wells only in the urban area of Manaus (Aguiar, 2002), meaning there are many unregistered wells.

In the regularization process, the authorization for drilling is given by a single environmental permit according to the State Law No. 3,785, dated July 24, 2012. The construction of the well must follow technical standards established by the *Associação Brasileira de Normas Técnicas* (Brazilian Technical Rules Agency - ABNT), plus extracted volume measurement equipment (hydrometer), water sampling device, auxiliary level measuring tube, and protective tube. It should be noted, however, that the topographic elevation of well heads should always be above the historical maximum flood level of its location (Cerh, 2016a).

The CERH resolution establishes the maximum water level drawdown during pumping at 45 meters below static water level. For commercial activities and services, the 40-meter retraction is limited and for domestic use up to 10 meters. The required studies are: constant discharge and step-drawdown pumping tests, physico-chemical and bacteriological water analyses. Water quality criteria are the same as those adopted by Health Ministry Order 2914 of 2011. It is also worth noting that in case of suspicion of contamination, IPAAM may request further analyses (Cerh, 2016 a).

Surface water abstraction

The reference flow used to obtain water use permits is Q_{95}. The catchment basins and reference data established by the installed stage gauges must be taken into account. These criteria will be valid until the approval of the PRH (CERH, 2016). In this way, the resolution defines that in case of lack of necessary hydrological information, the lowest flow measured in the place will be adopted, preferably the one realized in the period of drought. In a few cases there is monitoring of the basins already exists, so that this reference flow can be defined. The sum of the maximum flows granted in the basin shall not exceed 75% of the reference flow (Q_{95}), and each individual water use permit shall not exceed 20%. In drought situations, the reference flow $Q_{7,10}$ will be adopted .

Release of effluents

The basic water quality parameters used for permitting effluent being released into surface water bodies are determined by the resolutions of the Conselho Nacional do Meio Ambiente (National Environmental Council – CONAMA) since the Amazonas state has not yet classified its water bodies. Therefore, the CONAMA resolution 357 of 2005 that deals with the framing of water bodies and resolution 430 of 2011, that deals with effluent discharge standards, are used (Cerh, 2016).

The resolution also adds expressions to obtain the dilution flow and allowed concentration for the biochemical oxygen demand (BOD). The dilution flow should consider the effluent flow, the BOD concentration in the effluent, the allowed concentration and the natural concentration of the receiving water body. The concentration of the mixture should consider the effluent flow, the river flow, the BOD concentration in the river and the concentration of BOD in the effluent water. The resolution also adds that when effluents are released, the capacity of the receiving water body for the assimilation or self-purification of the amount of dissolved oxygen (Cerh, 2016) should be ascertained.

Use of hydroelectric potential

It is established that projects with a hydroelectric potential equal to or less than 1MW are not required to present Water Availability Reserve Declaration (DRDH). However, they are subject to the obligation to obtain the water use permit (Cerh, 2016). For energy potential higher than 1 MW in the Amazonas state water body, ANEEL must request the following information in the DRDH: a) present the project's technical form; b) copy of the technical note about the enterprise; c) geo-referenced location map; d) hydrological studies; e) reservoir studies; f)

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description of the characteristics of the enterprise and also; g) study of hydroelectric use. The issuance of the DRDH may be renewed at the request of ANEEL with the IPAAM, but the conversion of this into a water use permit must be requested by the entrepreneur upon receipt of an ANEEL concession (Cerh, 2016). In the case of a hydroelectric potential greater than 1MW and less than 30 MW, without a basic project, a simplified technical report should be presented (Cerh, 2016).

The other uses of water resources defined in Law 3,167 of 2007 and Decree 28,678 of 2009 were not specified in the resolution that establishes the criteria for water use permits.

After these regulations, the Amazonas State Water Resources Council (CERH) Resolution N.1 of 2016 was established, which defines the criteria for issuing the grants. Also published was Resolution 2 of 2016 which defines criteria and classifies the insignificant uses of water resources. Other regulations were made by means of joint ordinances between the governing and regulatory bodies of the state policy of water resources (PERH), such as normative order SEMA/IPAAM 01/2017. This provides for administrative procedures and documentation required for the issuance of water use permits in the scope of Amazonas state and was abolished by the Resolution 12/2017. Subsequent changes occurred through ordinances 75/2017 and 100/2017, where the changes refer to the deadlines for setting up the allowance right for using.

Among other purposes, these regulations established that all requests for allowance right for using water resources should be inserted by IPAAM in the National Register of Water Resources (CNARH-40). This register is administered by ANA and is used for mandatory registration of natural or legal persons, public or private rights who are users of water resources regardless of the field of use. This should be done for a knowledge of the actual demand for water resources, surface or underground in a given area, river basin or nationwide. However, not all states make this information available at the CNARH (Ana, 2016). The use of this national system also helps as a source of information for management reports, such as ANA's annual reports on water resources.

Between August 2013 and July 2014, 14,322 water use permits were issued in Brazil, of which 1,146 were issued by ANA. Most of them were emitted in São Paulo state (4,038) and the one that issued the least was Pará (ANA, 2015). In 2017, in its first year of implementation in the State of Amazonas, 31 permits were issued, but a significant amount of requests was under analysis (1.1198) (Cnarh-40, 2017). The State has progressed in establishing criteria and in the implementation of water use permits. There is need to advance in the implementation of the other instruments that subsidize the analysis of water use permits. Although they are not indispensable, they are extremely important to provide technical subsidies in the analysis of applications and in the management of water resources.

Conclusions

Analyzing the ordinances, decrees, and laws, it can be said: despite the existence since 2001 of a “State Policy of Water Resources for the Amazonas”, little progress has been observed in the last 15 years, with significant progress of 2016 with the establishment of technical criteria and being implemented in 2017, but occurred isolated from the other instruments of the Water Resources Policies.

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THE EFFECT OF CLUSTERS ON THE INNOVATION PERFORMANCE OF ENTERPRISES: TRADITIONAL VS NEW INDUSTRIES*

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Abstract. The present paper assesses the effect of the formation of cluster organisations on the innovation performance of member enterprises in two different industries – the traditional textile manufacturing industry and the new nanotechnology industry. Innovation performance is explored using Data Envelopment Analysis in two phases. In the first phase, it examines the ability of enterprises to transform resources (labour force, long-term capital, intellectual capital) into registered industrial property rights: patents, utility models, industrial designs, and trademarks. In the second phase, it assesses the ability of enterprises to commercialise industrial property rights and generate profits. Innovation performance then integrates both phases. In each industry, two samples were assessed: member enterprises of cluster organisations, and enterprises that operate in the same industry and region but are not members of a cluster organisation. The results of the research show that the existence of a cluster organisation has a greater effect on innovation performance in the traditional textile manufacturing industry. In contrast, in the new nanotechnology industry, the existence of a cluster organisation did not prove to have any significant effect on innovation effectiveness. In this industry, the existence of a cluster organisation had only a partial effect related to better industrial property rights commercialisation. Research shows that the type of industry is an important factor in the innovation performance of clustered enterprises.

Keywords: cluster organisation, industry cluster, textile cluster, nanotechnological cluster, innovation performance, innovation effectiveness, innovation efficiency, data envelopment analysis

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1. Introduction

Clusters are today considered to be one of the main instruments of regional policy used to create regional innovation systems. Since the 1990s, there has been a shift in the very concept of a cluster. From the original concept of a cluster as the geographical concentration of enterprises, universities, research institutes, professional organisations, and regional development agencies in a given territory, which benefits the actors in the form of economies of agglomeration, cluster organisations are now purposely established through cluster initiatives (Vasiljeva, 2013a). The formation of cluster organisations is often initiated by government bodies and supported using public funds. In the Czech Republic, the formation of cluster organisations has been supported since 2004, when the first Operational Programme Industry and Enterprise was approved; it included a sub-programme to support clusters (CLUSTERS). This was followed in 2007–2013 by the subsequent Operational Programme Enterprise and Innovation, which included the Cooperation sub-programme, and since 2014 on-going support for cluster organisations has been provided within the Operational Programme Enterprise and Innovations for Competitiveness. Since 2004, CZK 2.7 billion has been spent to support the formation and operation of cluster organisations in the Czech Republic (CzechInvest 2018). Therefore, the question of the effectiveness and efficiency of such public spending is important. In this case, effectiveness is understood to be the ability to achieve the objective of subsidy support, i.e. to improve the innovation performance of enterprises within clusters. Efficiency is then understood as accomplishing this objective with the least possible inputs.

The research aims to determine whether cluster organisations have a significant effect on the innovation activities of member entities. Innovation activities are measured by the number of patents, including European patents, utility models, industrial designs, and trademarks. Two industries were selected, one representing one of the Czech Republic's traditional industries (the textile and apparel industry) and the other representing the new area of nanotechnology. In each industry, two samples were defined – innovation enterprises in a cluster organisation and enterprises operating outside a cluster organisation in the given region. The research aims to verify the hypothesis that enterprises in a cluster organisation (in both industries) show better innovation performance than enterprises outside the cluster.

Data Envelopment Analysis (DEA) is used as the tool to measure effectiveness and efficiency. This is a multiple criteria linear programming method that assesses the relative efficiency of decision making units (DMUs) using multiple inputs and outputs (Zhu 2014). For each unit, such weights of inputs and outputs are sought as to maximise its efficiency. It should be noted that for the DEA method, the concept of efficiency is understood as being technical. In specific applications, the calculated value can also be interpreted as effectiveness or performance. A unit's efficiency rate is determined as the ratio of the weighted sum of outputs to the weighted sum of inputs. DMUs with an efficiency rate of 1 form the efficiency frontier that envelops inefficient units. This means that – for each decision-making problem – there is a set of production possibilities comprising all feasible input-output combinations. This set is surrounded by the efficiency frontier, which shows the highest level of outputs that can be achieved with a given amount of inputs. For the DEA method, returns to scale play an important role. In the case of constant economies of scale (CCR models), the efficiency frontier is a straight line. For the BCC model with variable returns to scale, the efficiency frontier has a convex shape. Models can be either input or output oriented. An input-oriented model assumes constant outputs. This means that in order to maximise efficiency, inputs need to be adjusted. An output-oriented model assumes constant inputs and aims to maximise outputs.

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2. Literature Review

At present, competing firms have a very strong tendency to agglomerate or group if they are located in a particular close geographic area (Akhmetshin et al., 2017; Alcácer and Chung 2014; Krugman 1991; Krugman 2010). The concept of clusters is linked to various conceptual and theoretical approaches around locally embedded groups of firms and other organisations, such as industrial districts or regional innovation systems (Uyarra and Ramlogan 2012). Porter's theory of clusters has sparked debate across a range of academic disciplines: from spatial planning and economic geography to public administration and economic development (Motoyama 2008). The past two decades have witnessed a great wave of interest in clusters by experts and economic policy makers, and support for clusters has become the predominant strategy to support regional development (Fang 2015). Clusters have now become a modern form of industrial cooperation, and the innovative nature of clusters is considered one of the key sources of a regional and national competitive advantage (D'Alise et al. 2014; Vasiljeva, 2013b).

Literature provides many definitions of a cluster: Porter (1998) defines a cluster as a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The OECD (2002) defines a cluster as a network of strongly interdependent firms, knowledge-producing agents (e.g. universities, research institutes), bridging institutions (e.g. brokers, consultants) and customers linked to each other in the production chain. Enright (1996) defines a cluster as a regional grouping in which member firms are in close proximity to each other. According to Swann and Prevezer (1998), clusters are large groups of firms in related industries and operating in a particular location. Ketels and Memedovic (2008) view clusters as the natural manifestation of expertise, skills, and infrastructure in improving productivity as a key determinant for maintaining a high level of prosperity in a given location. The above definitions of a cluster have one thing in common: the geographical concentration of firms and other institutions in a particular industry and a particular region. Such clusters can be described as being natural. In addition, clusters are currently being used as a regional-policy tool. Such clusters are the result of the organised efforts of a certain institution's cluster initiative (Sölvell et al. 2003). The result is the establishment of a cluster organisation as a legal entity that brings together enterprises, universities, research and professional institutions, and other entities for a particular purpose, for example in order to implement joint projects, share research infrastructure, and achieve cost savings. The present research assesses both types of clusters – natural clusters and cluster organisations – in order to determine whether the cluster type has an effect on the innovation performance of enterprises.

According to De Propris and Driffield (2006), cluster firms are characterised by a high degree of specialisation and complementarity. The benefits of clustering are very important in connection with innovations, technological changes, and the amount of spending on research and development (Ferreira et al. 2012). Porter (1998) notes that competition among cluster firms forces firms to increasingly innovate, improve, and create new technologies. According to Kaličanin and Gavrić (2014), clusters support the firms' productivity and innovation capabilities because these groups of firms have an information database that they can fully use.

In professional literature, it is widely acknowledged that the absorption capacity of firms to identify, acquire, understand, and use external knowledge directly affects their innovation capacity and performance (Terstriep and Lüthje 2012). At present, industrial groupings are considered one of the most important paths to open innovation and economic excellence (Zhao et al. 2010).

A firm's ability to innovate is not limited solely by the firm's boundaries, but it is increasingly dependent on external resources that exist in certain locations. Cluster membership should benefit a firm in terms of its innovation output rather than in terms of the firm's financial or growth performance (Lecocq et al. 2011).

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There are many studies that deal with spatial concentration and its contribution to a dynamic agglomeration economy. Earlier studies on the dissemination of knowledge and innovations within clusters came to the conclusion that spatial proximity alone brings innovations (Baptista 2000; Feldman 1999; Audretsch and Feldman 1996). However, recent studies have shown that spatial proximity must be coupled with cultural, cognitive, or organisational proximity to stimulate interactive learning and innovations (Terstriep and Lüthje 2012; Razminienė, Tvaronavičienė 2017; Suleimanova, 2014).

Many researchers have addressed the question of whether firms in clusters are more or less innovative than non-clustered firms. There are a number of empirical studies that prove that enterprises in a cluster may have a greater tendency towards innovation. However, the innovativeness of a cluster as a whole remains questionable, especially because it is difficult to measure (Zhao et al. 2010). For example, in their research on the Pakistan-based Faisalabad textile cluster, Khan and Gani (2004) argue against the cluster's importance and role in facilitating technological innovation and entrepreneurship.

In their article, Gimeno and Beal (2001) attempt to verify three hypotheses: 1) whether a geographical agglomeration affects a group of firms' involvement in innovation activities; 2) whether an agglomeration affects the group of firms' ability to successfully innovate; and 3) whether agglomerations affect firms' performance on the market. These questions were tested using a sample of 56 firms in the software industry in 1982 and 1998. Gimeno and Beal (2001) argue that the advantages of an agglomeration or clustering diminish over time, and even reduce the member firms' motivation to engage in innovation activities.

Audretsch and Feldman (1996) examined a database consisting of 8,074 commercial innovations that were introduced in the US in 1982. The research showed that that year, the vast majority of these innovations were created in firms headquartered either on the east or west coast. One possible explanation for this phenomenon is that the concentration of industry is associated with research and development activities. The authors also came to the conclusion that clustering mainly occurs in industries where there is university research, internal research and development, and a skilled labour force.

Other authors focus on patent citations. Jaffe et al. (1993) examine the connection between localisation and patent citations. Patent applications include quotations and references to previous patents. Research that was conducted in 1975 and 1980 and that examined more than 10,000 citations shows that patents tend to reference previous patents granted to firms in the same region.

Baptista and Swann (1998) analysed innovations that had been implemented by 248 British manufacturing firms in 1975 and 1982 and their article compared clustered firms with non-clustered firms. They found that strong industrial employment in a specific region increases the likelihood that the firm will innovate.

Based on data from Great Britain and Italy, Beaudry and Breschi (2003) found that clustering alone did not lead to higher innovation performance. Using European patent data as an indicator of enterprises' innovation activities, they conclude that the benefits of clustering arise only in clusters that are densely populated by innovative firms and have a large accumulated share of knowledge.

It is clear from the above that the empirical results are not consistent. Terstriep and Lüthje (2012) propose the hypothesis that interaction intensity within a cluster and innovation initiative are positively linked to the member firms' innovation performance. In their article, they presented the results of a survey responded to by managers of 107 firms in two regional ICT clusters in Germany and Switzerland. The findings show that the inclusion of firms in a cluster significantly increases their innovation success, which has a positive impact on their overall performance.

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However, innovation success often depends on specific conditions. For example, an analysis of financial performance that was carried out on firms in the semiconductor and pharmaceutical industries did not reveal any significant differences in performance between clustered and non-clustered firms at the beginning of their life cycle, while in later phases, non-clustered firms outperformed clustered firms (Kukalis 2010). Also, research by Žižka (2017) revealed the effect of the duration of the cluster's existence on performance. It addressed the effect of a textile cluster on the financial performance of member organisations. Financial performance was assessed using economic added value. It was found that the efficiency of firms in the cluster increased over the 5-year period under review, both due to a technological shift of the efficiency frontier and due to an improvement in internal efficiency resulting from economies of scale.

The results of a comparative analysis of biotech firms in the US, Israel, Sweden, India, and Great Britain by Folta et al. (2006) essentially support the existence of a positive cluster effect on member firms' innovativeness. The study also reveals that this effect decreases or even disappears in proportion to cluster size. A study of two information and communication clusters in Germany and China (Zhao et al. 2010) shows that especially soft factors (such as the network mechanism of the cluster) have a positive effect on the innovation performance of firms.

However, some experts (Fang 2015) warn that clusters may also inhibit innovation (negative externalities, excessive competition, and knowledge leakage). Nonetheless, many empirical studies reveal a rather positive relationship between clusters and innovation. In an article, Fang (2015) performed a meta-analysis of empirical studies on the relationships between clusters and innovations since the 1980s. The results show that clusters have a positive effect on innovation. At the same time, it must be noted that this positive relationship is not automatic and may be limited to a certain number of industries, certain development phases, certain locations, and certain specific conditions (Uyarra and Ramlogan 2012). The effect of the various industries on innovation performance was addressed by Žižka et al. (2016). The research assessed the performance of Czech innovative enterprises in 15 different industries using a two-stage DEA method. In the first stage, they measured the enterprises' ability to use available resources to generate the results of technical creative activities and subsequently the ability to commercialise the results. They came to the conclusion that innovation performance depends on the industry. In both components, it was found that the automotive industry had the largest proportion of successful firms, while the chemical industry had the smallest proportion. The research presented in this paper attempts to reveal whether cluster organisations that are set up to boost innovation have any effect on the innovation performance of enterprises.

3. Methodology

The research is based on the use of a two-stage Data Envelopment Analysis model that assumes variable returns to scale and is input-oriented. The research process can be divided into the following steps:

Step 1: Compiling a list of enterprises to be assessed in both industries – information on the members of the CLUTEX and NANOPROGRESS cluster organisations was sourced from both clusters' websites as of 31 December 2017. As of that date, the CLUTEX technical textiles cluster had 29 members, and the NANOPROGRESS cluster had 38 members. For each member, an analysis of its scope of business was performed according to the NACE statistical classification. In the case of the textile cluster, the core of the cluster consists of enterprises in industries NACE 132, 139, and 141. For the nanotechnology cluster, it is activity NACE 721. In the next stage, the regional coverage of both clusters was determined using localisation coefficients, see equation (1), taking into account the place of business of the members of both cluster organisations. In total, 4 samples were created: 2 for members of a cluster organisation (CLUTEX, NANOPROGRESS) and 2 for natural

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clusters. Each entity could only be a member of one sample, i.e. if it is a member of a cluster organisation, it is only assessed within that cluster organisation and not within the natural cluster.

$$LQ_i = \frac{\frac{E_{ir}}{E_r}}{\frac{E_{in}}{E_n}} \quad (1)$$

where LQ_i is the localisation coefficient in industry i, E_{in} is the number of employees in industry i at the national level, E_{ir} is the number of employees in industry i in region r, E_n is the number of employees at the national level, and E_r is the number of employees in region r.

Since CZSO's statistical yearbooks only cite employee figures with an accuracy of two-digit NACE codes, the MagnusWeb database of data on enterprises (Bisnode, 2017) was used to determine the number of employees in the different industries.

Textile and apparel manufacturing industries NACE 132, 139, and 141 (Weaving of textiles, Manufacture of other textiles, Manufacture of worn apparel, except fur apparel) are mainly concentrated in the Hradec Králové Region and the Pardubice Region, with an overlap into the Liberec Region, i.e. in the Northeast Cohesion Region. These are also the regions in which most members of the CLUTEX technical cluster operate. In addition, textile and apparel manufacturing also has a relatively important position in the Karlovy Vary Region and the South Moravian Region which, however, do not form one geographical unit with the Northeast region. Therefore, the Northeast region was defined as the natural textile cluster. Within this area, there were 164 enterprises operating in the above industries (excluding members of the CLUTEX cluster organisation, which formed a separate research sample).

Industry 721 Research and experimental development on natural sciences and engineering is mainly located in Prague and the neighbouring Central Bohemian Region and Pardubice Region (see Table 1). The relatively high concentration of this industry in the South Bohemian Region results from the Biological Institute of the Czech Academy of Sciences being located there, but the scope of its activities differs from the focus of a nanotechnology cluster. Apart from this one institution, no other major enterprises from the industry operate in the South Bohemian Region. Therefore, it can be concluded that the natural nanotechnology cluster includes the areas of three regions – Prague, the Central Bohemian Region, and the Pardubice Region. Within this area, there were 499 entities operating in industry 721 (excluding members of the NANOPROGRESS cluster organisation, which forms a separate research sample).

Step 2: Defining inputs and outputs – in the first phase, the enterprise's ability to use sources to create industrial property rights was assessed (see Figure 1). Employee numbers, long-term capital (equity, long-term liabilities, and long-term bank loans) and the duration of the firm's existence (which can be understood as a certain form of accumulated intellectual capital) were used as sources. The data were obtained from the MagnusWeb database (Bisnode 2017), and accounting data originated from balance sheets and profit and loss statements. The MagnusWeb database borrows financial statements from the collection of documents of the Commercial Register. Unfortunately, it must be noted that although firms have a statutory obligation to publish financial statements, many firms fail to meet this obligation and do not publish data in the Commercial Register. In the case of the CLUTEX cluster organisation, financial statements for 2015 were successfully obtained for 25 entities, and for 32 entities the NANOPROGRESS cluster. For the natural clusters, 100 financial statements were obtained for the textile cluster and 89 financial statements for the nanotechnology cluster. For 2016, the numbers of available financial statements were significantly lower. Therefore, data for 2015 were used.

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Table 1. Localisation coefficients by industry

Region	NACE 132+139+141	NACE 721
Prague	0.41	**3.63**
Pardubice	**3.97**	**1.06**
South Moravian	**1.19**	0.72
Central Bohemia	0.16	**1.28**
Liberec	**1.59**	0.26
Plzeň	0.34	0.41
South Bohemian	**1.07**	**2.34**
Karlovy Vary	**1.59**	0.08
Vysočina	0.99	0.08
Olomouc	0.52	0.12
Zlín	0.11	0.19
Hradec Králové	**4.55**	0.32
Moravian-Silesian	0.32	0.13
Ústí nad Labem	0.65	0.11

Source: MagnusWeb, 2017; Authors' calculations

The output of the first model is the number of patents, including European patents, utility models, industrial designs, and trademarks. The data were obtained through a search in the databases of the Industrial Property Office in January 2018. The numbers of active industrial property rights were sought.

In the second phase, to what degree enterprises were able to commercialise the protected results of technical creative activity was assessed. Since the DEA method requires inputs and outputs of the models to be non-negative, an indicator measuring enterprises' revenues against costs was constructed as the output. This is because a number of enterprises reported a loss and a negative value was added. For profit-making enterprises, the value of the indicator is greater than one, whereas for loss-making enterprises it is less than one, but it is always non-negative.

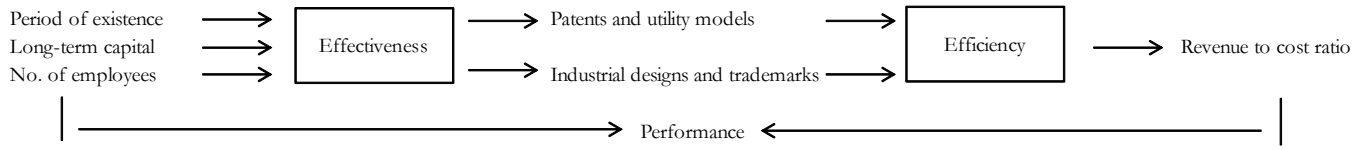


Fig. 1. Inputs and outputs of the model
Source: Prepared by the authors

Step 3: Formulating the mathematical model – based on previous studies (Žižka et al. 2016) that found increasing or decreasing returns to scale, the BCC model was used. It assumes variable returns to scale and is input oriented. The model's solution aims to minimise the purpose function z (2) under restrictive conditions (3), see e.g. Jablonský and Dlouhý (2004). Inputs are indicated as the symbols x_i, their weights as v_j, outputs are y_i with weights u_i. The variable μ is the deviation from constant returns to scale. The model was solved using the OSDEA-GUI open software (Virtos 2016).

$$z = \sum_{i=1}^{r} u_i y_{iq} + \mu \qquad (2)$$

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$$\sum_{i=1}^{r} u_i y_{ik} + \mu \le \sum_{j=1}^{m} v_j x_{jk,}\ k = 1, 2, ..., n$$
$$\sum_{j=1}^{m} v_j x_{jq} = 1 \qquad (3)$$
$$u_i \ge \varepsilon, i = 1, 2, ... r, \varepsilon \text{ - very small non- Archimedea n number } (> 0)$$
$$v_j \ge \varepsilon,\ j = 1, 2, ..., m,$$
$$\mu \in R$$

Step 4: Determining the effectiveness, efficiency, and performance scores – based on solutions to DEA models, the effectiveness, efficiency, and performance scores were determined for all four research samples, namely first for each entity and then for the entire research sample (i.e. for both cluster organisations – CLUTEX and NANOPROGRESS and for both natural clusters). For each sample, average values for the effectiveness, efficiency, and performance scores, standard deviations, and medians were calculated.

Step 5: Comparing the effectiveness, efficiency, and performance scores – the average and median values of effectiveness, efficiency, and performance for each research sample were compared. The basic research assumption was that enterprises in a cluster organisation show higher innovation performance than enterprises operating outside the cluster organisation. Secondly, it was assumed that enterprises in a high-tech industry would have better innovation performance than enterprises in a traditional industry. These basic research assumptions were operationalised into the following hypotheses:

H1: Members of the CLUTEX cluster organisation show a higher degree of innovation effectiveness than enterprises in the natural textile cluster.
H2: Members of the CLUTEX cluster organisation have a higher degree of efficiency in commercialising industrial property rights than enterprises outside the cluster organisation.
H3: The overall innovation performance of member entities in the CLUTEX cluster organisation is higher than that for enterprises operating independently outside the cluster organisation.
H4: Members of the NANOPROGRESS cluster organisation achieve higher innovation effectiveness scores than independent enterprises operating in the same industry and regions.
H5: Members of the NANOPROGRESS cluster organisation achieve higher efficiency in commercialising industrial property rights compared to non-member entities.
H6: The overall innovation performance of members of the NANOPROGRESS cluster organisation is higher than that for enterprises operating independently outside the cluster organisation.
H7: Innovation effectiveness in the NANOPROGRESS cluster organisation is higher than that for the CLUTEX cluster organisation.
H8: The efficiency of industrial property rights commercialisation in the NANOPROGRESS cluster organisation is higher compared to the CLUTEX cluster organisation.
H9: The overall innovation performance of the NANOPROGRESS cluster organisation is higher than that for the CLUTEX cluster organisation.
H10: Innovation effectiveness is higher for enterprises in the natural nanotechnology cluster compared to enterprises in the natural textile cluster.
H11: The efficiency of industrial property rights commercialisation is also higher for enterprises in the natural nanotechnology than that for enterprises in the natural textile cluster.
H12: Overall innovation performance is higher in the natural nanotechnology cluster compared to the natural textile cluster.

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In order to test the above hypotheses, it was necessary to obtain information on whether all data were normally distributed. The normality of all data samples was tested using the Shapiro-Wilk test, where the null hypothesis assumes that the sample comes from a normally distributed population. All tests that were used to obtain the outputs presented in this paper were performed at a 5% significance level, i.e. including normality tests. It turned out that none of the twelve samples was normally distributed. Where data were not normally distributed, this may have been due to the nature of the data or due to the presence of outliers. For each data sample, the Dean-Dixon Q test was therefore also used to verify whether the sample contained outliers. It was found that none of the samples contained any outliers.

Based on the results of the two previous methods, the authors decided to use the Mann-Whitney U test to compare the above indicators in two selected samples (as described in hypotheses 1–12). This test should be used to compare the expected values (most commonly the medians) in two independent samples where the data are not normally distributed.

4. Empirical Results and Discussion

The research results are divided into two parts. In the first part, the average effectiveness, efficiency, and performance scores were analysed in each research sample. In the second part, the differences between cluster organisations and industries were assessed.

4.1 Innovation effectiveness, efficiency, and performance

For each enterprise and subsequently for each research sample, the innovation effectiveness score, the score of industrial property rights commercialisation efficiency, and the overall innovation performance score were determined. Table 2 shows that the average innovation effectiveness score ranged from 0.57 to 0.77. This means that, on average, enterprises would have to reduce their inputs by 23% to 43% in order for us to consider the use of inputs as being effective to protect the results of technical creative activity and to protect rights to marks. Nine enterprises (36%) in the CLUTEX cluster organisation and 12 enterprises (12%) in the natural textile cluster were located on the efficiency frontier. In the other industry, namely nanotechnology, 10 enterprises (31.25%) in the NANOPROGRESS cluster organisation and 18 enterprises (20.22%) in the natural cluster were located on the efficiency frontier. In other words, this means that enterprises tend to underestimate the issue of industrial property rights protection. In the next phase, the ability of enterprises to commercialise registered industrial property rights (i.e. to turn them into profits) was examined. In all of the samples under examination, the average efficiency score was relatively low – ranging from 0.41 to 0.63. This means that in economic terms, enterprises are not able to adequately capitalise on their registered industrial property rights. In order to achieve full efficiency, a 37% to 59% smaller amount of registered industrial property rights would suffice. In the second phase of the analysis, 6 enterprises (24%) in the CLUTEX cluster organisation and 10 enterprises (31.25%) in the NANOPROGRESS cluster organisation were located on the efficiency frontier. In the natural clusters, only 7 enterprises (7%) in the textile industry and 5 enterprises (5.62%) in the nanotechnology industry were located on the efficiency frontier. The overall innovation performance was obtained as the product of the innovation effectiveness score multiplied by the innovation efficiency score.

4.2 A comparison of the differences between industries

In the next part of the research, the significance of the differences in innovation effectiveness, efficiency, and performance both between cluster organisations and between enterprises operating independently outside cluster organisations was analysed in both industries. The test results are clearly shown in Table 3.

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Table 2. Average effectiveness, efficiency, and performance scores.

Indicator	Cluster			
	CLUTEX	**Textile natural**	**NANOPROGRESS**	**Nano natural**
Effectiveness – average	0.6908	0.5703	0.6692	0.7692
Effectiveness – SD	0.2638	0.2715	0.2431	0.2267
Effectiveness – median	0.6308	0.4811	0.5241	0.8057
Efficiency – average	0.5650	0.4050	0.6343	0.5311
Efficiency – SD	0.2734	0.3123	0.2897	0.3280
Efficiency – median	0.4942	0.2307	0.5626	0.5000
Performance – average	0.4367	0.2996	0.4685	0.4626
Performance – SD	0.3381	0.3474	0.3424	0.3551
Performance – median	0.3171	0.1158	0.2753	0.4267

Source: Authors' calculations

Table 3. A comparison of effectiveness, efficiency, and performance in both industries.

Hypothesis	P-Value	Conclusion
H1	0.01763	H1 was proven.
H2	0.001040	H2 was proven.
H3	0.001232	H3 was proven.
H4	0.9684 (0.03158)	H4 was not proven. (The opposite was proven.)
H5	0.04282	H5 was proven.
H6	0.3525	H6 was not proven. (H_0 is not rejected for any alternative hypothesis.)
H7	0.6315	H7 was not proven. (H_0 is not rejected for any alternative hypothesis.)
H8	0.1966	H8 was not proven. (H_0 is not rejected for any alternative hypothesis.)
H9	0.4421	H9 was not proven. (H_0 is not rejected for any alternative hypothesis.)
H10	$1.7565 \cdot 10^{-7}$	H10 was proven.
H11	0.005121	H11 was proven.
H12	0.00005616	H12 was proven.

Source: Authors' calculations

This table 3 points to the establishment of the CLUTEX cluster organisation as having had a positive effect on the innovation performance of its member enterprises, i.e. both its components. This means that member entities of the CLUTEX cluster show a better ability to use resources to create industrial property rights while also being able to commercialise them more effectively, which is reflected in their better economic performance compared to enterprises that are not part of a cluster organisation. This – in turn – underlies the superior innovation performance of the members of the CLUTEX cluster organisation. The result of the third test is logically predictable given the nature of the data – the performance indicator is the product of the efficiency indicator multiplied by the effectiveness indicator.

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Focusing on the area of nanotechnology, the fourth hypothesis aims to prove that members of the NANOPROGRESS cluster organisation achieve higher innovation effectiveness scores than enterprises in the natural nanotechnology cluster. However, in this case, the assumption that the cluster organisation has a positive effect on innovation activities was not proven. Looking at the high p-value (0.9684; see Table 3), the details of the test were examined in order to identify the reasons for such a high value. It was found that the median value was 0.5241 in the first sample (i.e. the NANOPROGRESS cluster organisation) and 0.8057 in the second sample (containing data for the natural nanotechnology cluster). Even these sampling values already indicate that the right-tailed hypothesis cannot be proved. However, if an alternative left-tailed hypothesis is defined, we obtain a p-value of 0.0316, which means that it is possible to prove the opposite of the original assumption at a 5% significance level. This means that enterprises in a natural nanotechnology cluster have a higher innovation effectiveness score than the members of the NANOPROGRESS cluster organisation.

In the next step (H5), we examined whether enterprises that were organised in the NANOPROGRESS cluster were able to achieve a higher efficiency of industrial property rights commercialisation compared to the natural nanotechnology cluster. In this case, it is possible to prove that the cluster organisation has a positive effect on industrial property rights commercialisation and economic results. However, it was not proven (H6) that the overall innovation performance of the member organisations of NANOPROGRESS is higher. In the case of NANOPROGRESS, the cluster organisation only had a partial effect on innovation performance.

In the next three tests (H7 to H9), the two cluster organisations – CLUTEX and NANOPROGRESS – were compared. First, the assumption that innovation effectiveness in the NANOPROGRESS cluster organisation is higher than that for the CLUTEX organisation was tested. However, this hypothesis was not proven. The hypothesis that the NANOPROGRESS cluster organisation had a higher efficiency of industrial property rights commercialisation also was not proven. Logically, the overall innovation performance of the members of the NANOPROGRESS cluster organisation is thus not higher than for the cluster organisation in the textile industry.
Within the last group of three assumptions, the first claim to be assessed was that enterprises in the natural nanotechnology cluster have a higher innovation effectiveness than in the natural textile cluster (H10). This hypothesis was proven. Also, industrial property rights commercialisation was identified to be more effective in the nanotechnology industry (H11) and, logically, the overall innovation performance of enterprises in this industry was found to be higher compared to the textile industry (H12).

The results of the research show that the establishment of the CLUTEX cluster organisation has had a positive effect on the innovation activities of its member enterprises. The textile industry is one of the Czech Republic's most traditional industries. At the same time, this industry has undergone a major transformation over the past 25 or so years. Conventional mass textile production has all but disappeared from the Czech Republic due to competition from cheap Asian production. Over the 1993–2015 period, the number of employees in textile manufacturing decreased by two-thirds (CZSO 1993; CZSO 2017). However, the industry still employs more than 50,000 people. Enterprises that were able to overcome the crisis in the industry had to reorient themselves towards products with high value added such as technical textiles, textiles for the health sector, sports uses (artificial lawns), and so on. The CLUTEX cluster organisation brings together key players in the industry, including its research base. For enterprises in the textile industry, the establishment of a cluster organisation was probably the key factor that strengthened their innovation activities and competitiveness on the market.

By contrast, in the nanotechnology industry, the cluster organisation was not proven to have a positive effect on generating industrial property rights. This may be due to the fact that nanotechnology enterprises are very innovative, regardless of whether or not they are members of a cluster organisation. The positive effect of the NANOPROGRESS cluster organisation could then be seen in the members' better ability to commercialise

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industrial property rights and, by extension, achieve better economic results. Nevertheless, even this partial benefit of the cluster organisation can be assessed as positive.

For textile enterprises, the importance of being organised in a cluster was confirmed by the fact that innovation effectiveness and commercialisation were significantly higher for non-clustered firms in the nanotechnology industry than for non-clustered firms in the textile industry. However, in the case of the member enterprises of the two cluster organisations, there are no significant differences in innovation performance. This means that enterprises in the textile industry that had joined the CLUTEX cluster organisation were able to catch up with enterprises in the NANOPROGRESS cluster organisation in terms of generating industrial property rights and being able to commercialise them, as well as in terms of overall innovation performance.

In principle, the results of the research confirm the findings presented in literature, namely that clusters have a positive effect on the innovation activities of enterprises (Ferreira et al. 2012; Porter 1998, Kaličanin and Gavrić 2014; Babtista 2000). However, it turns out that the specific conditions of the various industries play an important role. While in the textile industry, the formation of a cluster organisation was proven to have a clearly positive effect on the innovation performance of its member enterprises, only a weak effect was found in the other industry, nanotechnology. This finding is consistent with the findings (Uyarra and Ramlogan 2012) that the positive correlation between clusters and innovation is not automatic. The fact that a weaker effect was found in a modern technology industry is somewhat analogous to studies from the software industry (Isaksen 2006) and the biotechnology industry (Folta et al. 2006), which arrived at similar conclusions.

Conclusions

This research aimed to determine whether cluster organisations had a significant effect on the innovation activities of its member entities. A clearly positive effect of cluster organisation membership was proven in the technical textiles industry. Member enterprises of the CLUTEX cluster organisation behave more effectively in generating industrial property rights and are able to commercialise them more effectively than other enterprises in the textile industry operating in the same region. As a result, their innovation performance is higher. By contrast, the same effect was not proven in the nanotechnology industry. The cluster organisation was only found to have a positive effect on industrial property rights commercialisation. However, the innovation performance of member enterprises in the NANOPROGRESS cluster organisation was not higher than for non-clustered firms. A stronger effect of clustering on innovation performance was thus proven in the traditional textile and apparel manufacturing industry. Enterprises in both cluster organisations showed basically no differences in their innovation performance level. This indicates that the formation of a cluster organisation has a significant effect on achieving higher innovation performance in traditional industries. For firms in the textile industry, cluster membership is an important factor in their competitiveness.

The research results show that the effect of cluster organisations on innovation activities depends on the industry. Contrary to initial expectations, in the case under review, a stronger effect proved to exist in a traditional industry than in the high-tech sector. However, the research was only based on data from two industries, which must be considered a limiting factor. Therefore, follow-up research will focus on verifying the effect of the industry on innovation performance in clustered versus non-clustered enterprises. The research samples will include a mix of various industries in which cluster organisations exist.

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START-UPS IN THE FIELD OF SOCIAL AND ECONOMIC DEVELOPMENT OF THE REGION: A COGNITIVE MODEL

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Abstract. The article considers the factors influencing regional development on the part of start-ups, shows a cognitive model of such impact, and gives an analysis of scenario modeling in the Samara Region. The research results are aimed at creating favorable conditions for ensuring the progressive development of a single region and the entire Russian economy. To implement the goal, studies were carried out in the form of an expert survey aimed at assessing the impact of start-ups on regional development. The study included methods of systemic analysis, economic statistics, methods of sociological expert survey, a method of statistical data analysis, a method of qualitative peer review, and a method of cognitive modeling. The article presents the results of scientific research aimed at identifying the mutual influence of the basic factors of regional development and start-ups as an important element of the socio-economic system. The works of many scholars are devoted to the analysis and research of the problem of innovative entrepreneurship. They reveal the aspects of studying innovative entrepreneurship in the context of improving the effectiveness of innovative activity and motivating entrepreneurship. This study highlights the importance of start-ups for the formation and development of effective regional innovation systems and actualizes investigations related to identifying the main directions in the activities of the region's start-ups. A comparative analysis of the scenarios was carried out and the most effective of them were determined for the Samara Region. The presented research results can be transferred and reproduced in any constituent entity of the Russian Federation. The obtained cognitive models can be used as basic models to back up large administrative decision-making in the field of managing the regional infrastructure for supporting small and medium-sized businesses to improve its adaptability to changes in external and internal factors and to determine the trajectories of sustainable development. In addition, the obtained models can be applied in the field of fundamental research on the functioning and development of regional socio-economic systems, as well as in applied research in modeling options for sustainable development of regional socio-economic systems.

Keywords: start-ups; business; innovative entrepreneurship; social and economic development; factors; cognitive model

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JEL Classifications: A14, M21, R11

1. Introduction

As shown by the domestic practice and international experience, the greatest effect in the implementation of priority areas of economic and social development can be achieved only if the reforms carried out are innovative. In turn, the scale and pace of innovative transformations directly depend on the degree of

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involvement and actual participation of both the state and private business in the innovations. Today, the innovation process is the determining factor in the effective development of production. A special place in the structure of modern small and medium-sized business is occupied by innovative entrepreneurship (Vojtovic, 2016; Wroblowska, 2016; Kozubikova et al., 2017; Tvaronavičienė, 2017; Razminienė, Tvaronavičienė, 2017), which is a source of generating innovative ideas and developments, socio-economic development of the regions of the Russian Federation (Rakhimova, 2014; Vinogradova, 2015; Tatarkin, 2013; Akhmetshin, 2017; Akhmetshin et al., 2017; Rakhimova, 2014; Vinogradova, 2015; Tatarkin, 2013; Afonin & Orlova, 2017). A constant assessment of the mutual influence of regional development factors and start-ups is an integral part of the entrepreneurship support system. The formalization of such an assessment based on the method of cognitive modeling has become the goal of this scientific research.

The purpose of the study was to identify the mutual influence of the basic factors of regional development and start-ups on the basis of the cognitive modeling method.

The tasks of this research were to determine the factors affecting the regional development on the part of start-ups; show scenario modeling of the impact of start-ups on regional development; make a comparative analysis of scenarios and determine the most effective of them for the Samara Region.

The scientific novelty lies in revealing specific features of the influence of start-ups in the field of social and economic development of the region and presenting the most effective scenario of social and economic development of the Samara Region through the development of business start-ups based on the method of cognitive modeling.

The research hypothesis: the regional management of socio-economic development processes is influenced by the administrative regulating measures that dominate the mechanisms of competitive, market-based self-regulation. Partnership relations between the regional authorities and small innovative business provide a sustainable socio-economic development of both the business itself and the region as a whole.

2. Literature review

In the world practice, the innovative entrepreneurship management mechanisms were studied by Drucker (2007), Hayek (2005), Schumpeter (2007), Say (2001) and others. The problems of innovative entrepreneurship were considered by such Russian scholars and experts as Kosharnaya (2016), Maslennikova (2001), Medynsky and Skamay (2005), Obraztsova and Chepurenko (2008) etc.

The works of Vasiliev (2000), Gokhberg (2003), Glazyev (1993), Dagaev (2000), Zavlin et al. (2004), Kazantsev et al. (2003), Kovalev (2000), Livshits and Livshits (2000), Lvov (2003), Fatkhutdinov (2004) and other scholars are devoted to the problems of increasing the effectiveness of innovative activities.

Theoretical and practical issues and peculiarities of the formation and development of regional innovative systems, the evolution of functions of the state and the business sector in the innovation process are disclosed in the numerous works of scientists, e.g. Archibugi, Howells and Michie (1999), Autio (1998), Dosi et al. (1988), Lundvall (1992), Nelson (1993), Todtling and Kaufmann (1999), Howells (2004) and others.

At the present stage innovative activities become one of the most important systemic factors of economic growth, increasing the competitiveness of domestic products, ensuring the economic security of the country. A special role is assigned to the social and economic development of the regions through the development of business start-ups.

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3. Methodology

The study, in the form of an expert survey, focused on assessing the factors affecting the regional development on the part of start-ups, was conducted:
- on the basis of the analysis of various aspects of socio-economic activities of the regions (the legislative framework for the development of business, the grounds and practice of increasing the transparency of power in modern Russia, the analysis of problem situations in the relationship of civil society with local governments, especially the financing of innovative projects in the regions);
- on the basis of an expert survey conducted in April (stage 1), in May (stage 2) in 2017 (13 experts from the Samara Region). The survey data was processed using the SPSS program.

Technical support of the conducted research was carried out with the help of the "Analyst" program. The program is designed for cognitive modeling of weakly-structured processes, studying their dynamics, constructing predictive scenarios for the development of the situation, analyzing and predicting the consequences of managerial decisions (Dakhin et al., 2011).

The cognitive approach is widely used in the study of socio-economic and political processes. Its main advantage is the ability to conduct the qualitative simulation of the situation development, for example, from negative initial states to positive ones, as well as in the possibility of studying the behavior of the system for stability (predictability).

4. Results

According to the results of the expert survey, seven respondents refer themselves to the economic sphere, two respondents characterize themselves in the context of belonging to the sphere of jurisprudence, and four persons are specialists in the field of sociology.

Let us consider the problem situations of the socio-economic process through the implementation of the sequence of the following steps:
- identifying a set of the most significant factors describing the problem situation, the process, the system (Table 1);
- singling out target and managed factors;
- establishing the cause-effect relationships between the factors.

Table 1. Correspondence between the analytical, statistical data and the factors of the cognitive modeling system

	Statistical, expert data	Factors of the cognitive modeling system
1.	The number of start-up projects with an evolutionary development path, the annual turnover of such projects	F1, Sustainable start-up
2.	Number of business incubators, resource centers for non-profit organizations, social entrepreneurship, similar institutions for the generation of business culture	F2, Business culture incubators
3.	Amount of private investment	F3, Private investment
4.	Amount of public investment	F4, Public investment
5.	Number of PPPs, IPPs, expert assessments	F5, Quality of the regulatory and legal framework
6.	Correspondence of the competences of the start-up technology team members	F6, Team professionalism
7.	Employment in the small and medium-sized business sector, incl. IE; wages in SMEs, the average volume of annual turnover in rubles.	F7, Entrepreneurship development
8.	Number of PPPs, IPPs, enterprises, projects and structures with the participation of universities, on the basis of universities or research institutes;	F8, Interaction of science, business and power
9.	Number of legislative initiatives of citizens, NPOs, incl. in the sphere of	F9, Innovative activity of the population

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	business; number of referendums initiated by citizens; number of participants in grant competitions	
10.	% of innovative products in the region, the number of enterprises that produce innovative products, the volume of manufactured innovative products in the region (UM/RUB); The volume of innovative goods and services provided by SMEs	F10, Innovative entrepreneurship development
11.	The level of income of the population, the level of labor productivity, revenues of the region	F11, Socio-economic state of the region
12.	Human development index (HDI), GRP per capita, average life expectancy of the population in the region, birth rate, degree of satisfaction of housing demand, quality/convenience of medical services, quality/convenience of educational services, quality/convenience of roads, quality/convenience of the environment for the disabled, quality/convenience of public and municipal services	F12. Quality of life of the region's population
13.	The volume of actual demand for innovation in the region	F13. Demand for innovation
14.	Number and effectiveness of government programs to support innovation activities in the region. Number of patents in the region	F14, Innovative policy of the region
15.	% of the introduction of ICT in the sphere of business, state, municipal government, the percentage of computer literacy of the workable population, the number of citizens receiving government services through a private office	F15, Informatization of the region
16.	The number of complaints to the Ombudsman for the rights of entrepreneurs, the number of collective appeals of entrepreneurs for this reason	F16, Administrative barriers
17.	Number of corruption cases, incl. those brought to trial	F17, Corruption
18.	The inappropriate use of investments in start-up projects, violation of legislation, the number of administrative, criminal fraud charges in the business incubator sphere, the prevalence of the 'carousel' of business teams on the basis of business incubators	F18, Fraudulent activities
19.	Non-viable start-ups, existing only with the availability of benefits, government support, lobbying. Number of non-viable projects that have passed through the support system	F19, Rogue start-ups
20.	% of quality work with start-up projects	F20, Dysfunctions
21.	The proportion of the retirement age population, the proportion of youth, the number, the proportion of unemployed in the region	F21, Demographic profile
22.	Technological profile of the region (dominant technological setups)	F22. Technological setup
23.	The volume of financing the economy from the federal budget on the basis of state order. Volumes of state procurement in the region	F23, State order

In this case, in the opinion of the experts, the social and economic development of the region is under a weak influence of the judicial power and the depressed community (assessed as 0.1-0.3) and under a moderate influence of shadow finance, criminality, rogue start-ups (assessed as 0.3-0.5). The other factors have a strong influence (assessed as 0.5-1). In addition, the experts named the focus of start-up on the international markets, a favorable urban environment, a comfortable social living environment, an innovative activity of the population and some others among the additional factors of influence.

Let us consider the qualitative-quantitative analysis of the factors of innovative development of the Samara Region to determine the list of statistically determined and expertly defined values of the indicators. Statistically determined indicators are reduced and compared with the cognitive modeling factors according to the "1 factor – 1 statistical indicator" principle. Expertly determined indicators are identified in the course of an expert survey.

To construct a cognitive model of mutual influence of the start-up factor and the main factors of socio-economic development of the region, an expert comparison of factors (indicators) of the experimental cognitive model and statistical indicators characterizing social and economic development was carried out.

Table 2 provides a list of factors of the cognitive model and the corresponding statistical indicators with the dynamics for the period of 2011-2015. The table is accompanied by the results (Table 2a) of the correlation

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analysis for quantitatively measurable factors of the cognitive model, for which cause-effect relationships are indicated.

Table 2. Factors and indicator of the Samara Region

The model factors		Statistical indicators	2011	2012	2013	2014	2015
F2	Business culture incubators	The number of organizations engaged in research and development (units)	62	61	62	62	76
F3	Private investment	Private investment (RUB mln.)		191186.5	239143.1	296197.1	279102.3
F4	Public investment	Public investment (RUB mln.)	182575.3	213021.8	269736.5	321759.5	298746.4
F7	Entrepreneurship development	Average number of the SME employees (persons)	359.3	369.3	354.8	357.2	375.9
F9	Innovative activity of the population	Patent applications filed (units)	1049	1106	987	883	932
F10	Innovative entrepreneurship development	The share of organizations that implement technological innovation	8.5	5.7	5.0	5.3	4.7
F12	Quality of life of the population	Expectancy of life of the population (years)	69.0	69.7	69.4	69.6	70.4
F14	Innovative policy	Patents issued (units)	720	843	921	840	779
F15	Informatization of the region	Organizations that had a website on the Internet (in % of the total number of organizations surveyed)	33.7	33.5	31.9	31.6	31.0
F17	Corruption	The number of registered crimes qualified as “Bribery” (units)	279	172	204	230	164
F21	Demographic profile	Number of the retirement age population at the age of 55-59 (as of January 1, persons)	931.6	943.3	952.9	962.8	970.5
F22	Technological setup	Share of high-tech and knowledge-intensive products in the GRP (%)	27.1	27.4	26.0	26.4	25.9
F23	State order	Investments in R&D (RUB thous.)	408.4	101.0	336.6	2090.0	672.9

Table 2a. Results of the correlation analysis for the Samara Region

F2*F14	-0.3134705
F3*F7	-0.12931591
F4*F23	0.717239799
F7*F9	0.127770444
F9*F7	0.127770444
F9*F21	-0.80892326
F10*F9	0.489171302
F12*F10	-0.75032044
f12*f14	0.059763538
f14*F10	-0.68731671

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F15*F14	-0.31422929
F15*F17	0.442956368

Let us consider the most significant data of the expert survey conducted in May 2017. The survey involved 13 experts. The survey data were processed using the SPSS program.
Tables 3-6 give the data that are significant for cognitive modeling.

Table 3. Estimates of the proportion of successful, sustainable start-ups in the total mass of start-ups in the region (in %% of the number of respondents in the region)

Proportion of successful, sustainable start-ups in the total mass of start-ups	The Samara Region
approximately up to 10% of the sustainable start-ups	61.5
approximately up to 30% of the sustainable start-ups	15.4
approximately up to 50% of the sustainable start-ups	7.7
approximately up to 70% of the sustainable start-ups	15.4

The obtained data allow drawing a conclusion that in the Samara region the experts perceive the nuances of start-ups' states most differentially, which is associated with a wide variety of these practices and with a wider competitive field of business and expert standpoints. On the one hand, there is a greater 'diversity' of opinions, but, on the other hand, it is an indirect indicator of a more developed system of market relations, that is, the of entrepreneurship development (F7), including entrepreneurship in the market of expert appraisal: expert assessments are distributed according to four standpoints out of four. Proceeding from this, it can be ascertained that in the Samara Region the level of entrepreneurship development is slightly (weakly) exceeded.

Table 4. Opinions about the differences in the impact of various sources of investment in start-ups

Is it possible to consider that with state investments in start-ups, the number of rogue start-ups (a kind of business rejects) is higher than for the same volumes of private investments, where the number of rogue start-ups is lower?	The Samara Region
Yes	61.5
No	38.5

These tables show that in the Samara region, a slightly larger number of experts believe that with public investments in start-ups, the number of rogue start-ups (a kind of business rejects) is higher than with private investments. This enables to draw a conclusion about the indirect, weak negative component in the linkage of factors (F4) Public investment → (F19) Rogue start-up.

Table 5. Estimates of the intensity of the influence exerted by negative social phenomena on the size of the share of the rogue start-ups in the region (in average points)

If you think that corruption, administrative barriers, fraudulent activities affect the share of the rogue start-ups in your region, how do you assess the intensity of this influence? (from 0 to 1, where 0.1 is weak significance, and 1 is strong significance)	The Samara Region
Corruption	.7154
Administrative barriers	.5846
Fraudulent activities	.5769

The data show that experts recognize that corruption, administrative barriers and fraudulent activities affect the increase in the share of rogue start-ups in the region. At the same time, the intensity of such influence has weak differences for different factors. This means that it is possible to distinguish in the Samara region that the influence of the factor (F17) "Corruption" and (F18) "Fraudulent activities" on the factor (F19) "Rogue start-up" has a weak deviation towards a higher intensity (i.e., F17 and F18 affect the increase in factor F19 slightly more actively).

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Table 6. Estimates of the degree of influence of the start-ups' mass on the growth of innovative economy of the region (in average points)

If the influence of the mass exists, how do you assess the power of this influence? (from 0 to 1, where 0.1 is weak significance, and 1 is strong significance).	The Samara Region
Sustainable start-ups (positive influence)	.5769
Rogue start-ups (negative influence)	.5154

Expert estimates of the power of influence of the rogue start-ups' mass on the regional innovative development in the Samara Region are significantly high. Indirectly it means that there is a slight excess of the negative influence of the factor (F19) "Rogue start-up" on the factor (F10) "of Innovative entrepreneurship development" in the Samara Region. Accounting for this parameter in the Samara region allows considering the specifics of the region in this regard.

According to experts, the significance of the state order (financing from the state budget) for the economy and social sphere of the region was estimated as -0.7 (in average points).

Data of the experts' estimates on the significance of state orders for the economy and social sphere reflects the background level of budgetary dependence of the economy and the social sphere (Dobrenkov et al., 2017).

The experts assessed the effective activity of business incubators at the level of 0.5 (in average points). Data of the experts' estimates show that experts of the Samara Region highly appreciate the effective activity of incubators. This, firstly, confirms the specifics of the region associated with a freer economic market space. Secondly, this means that the influence of the factor (F2) "Business culture incubators" on the factor (F1) "Sustainable start-up" has a slight excess.

In general, innovative entrepreneurship is developing most successfully in the Samara Region. The region is out-grossed by the more innovatively active Russian regions, such as the Moscow Region, the Republic of Tatarstan, the Sverdlovsk Region, including by the share of organizations that implement technological innovation.

The peculiarities of the interaction of the system factors, obtained as a result of the analysis of statistical indicators and expert estimates, are loaded into the "Analytic" program to create cognitive matrices for the region for scenario cognitive modeling.

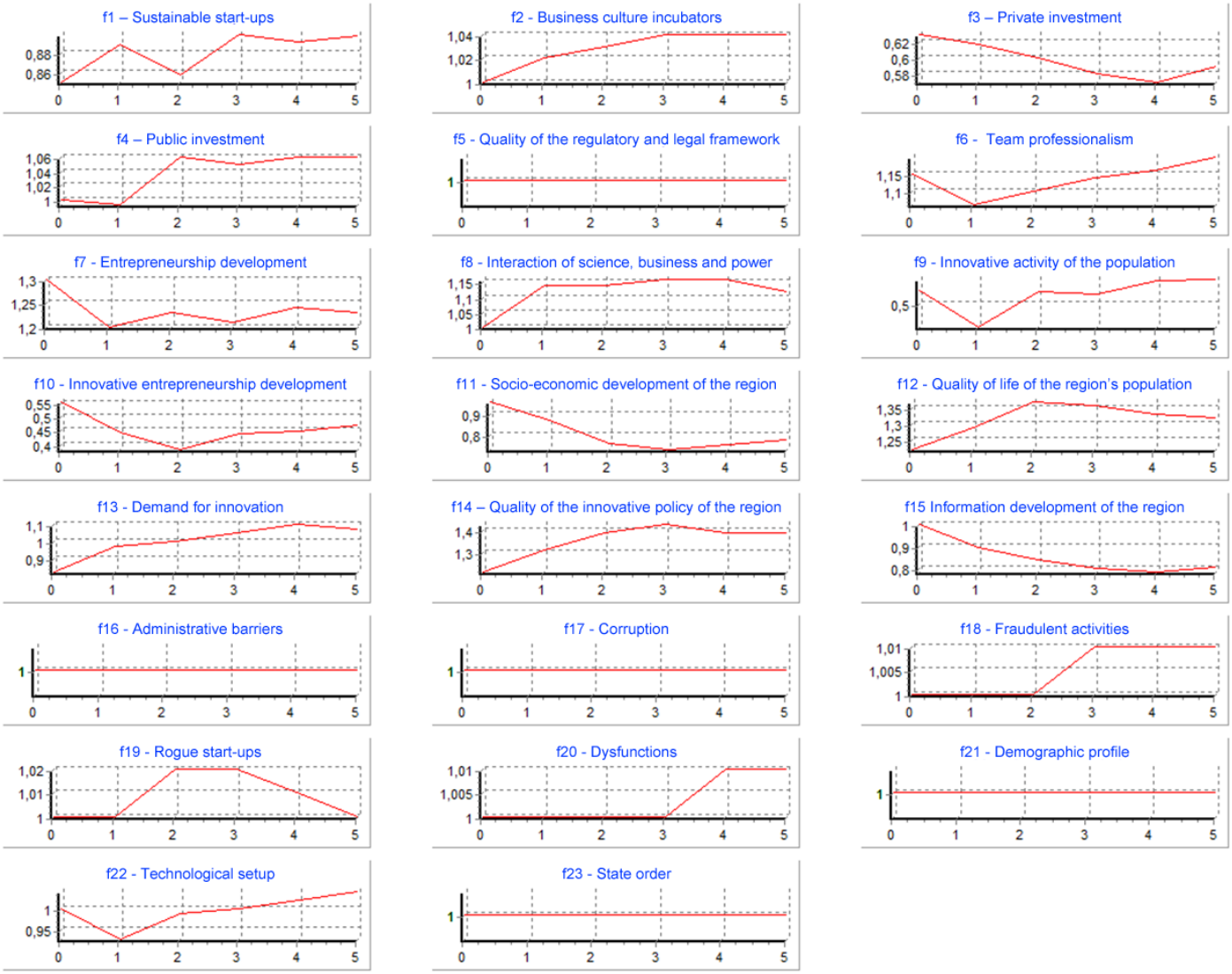
Basing on the expertise and the analytical data in the "Analytic" program, the basic cognitive model "Start-Ups in the Field of Social and Economic Development of the Region" is formed, not taking specific regional features into account.

Modeling is carried out for the period of the next presidential cycle of Russia 2018-2024 (6 years).

Scenarios of socio-economic development of the Samara Region through the development of business start-ups are presented as follows.

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Scenario 1



Comment

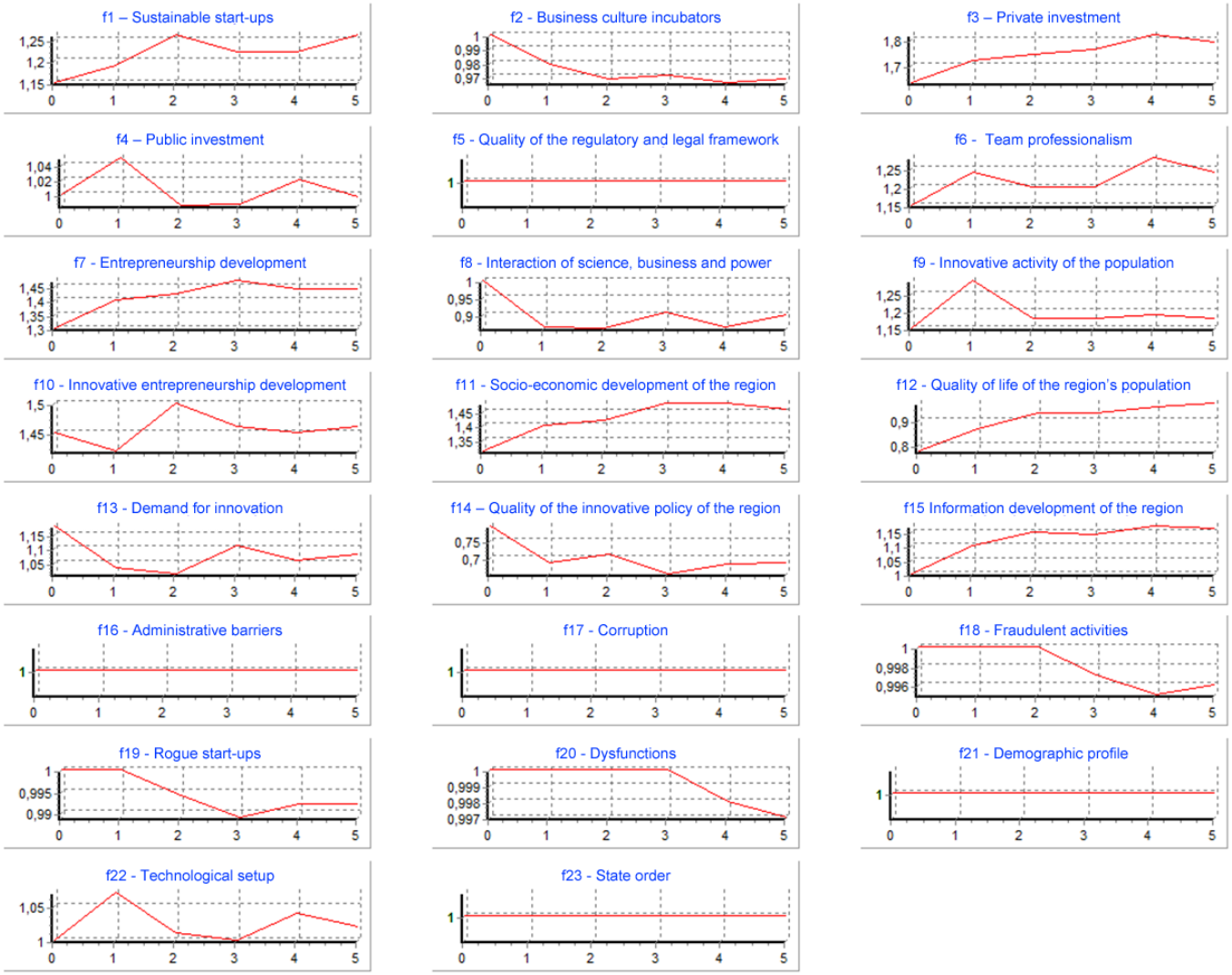
The results of the modeling show that in the perspective of six years the quantity trend of the sustainable start-ups is nonmonotonic: the decrease in the middle of the period by 11% is changed by a slight increase by3% of the lower level later on. Thus, if the trend is maintained, for 100 start-ups in 2017, their number will increase to 103 units by 2026. The number of the rogue start-ups will remain at the level of the previous four years.

There is a negative trend: a decrease in the entrepreneurship development (15%), the innovative entrepreneurship development (17%), innovation activity of the population (27%), and public investment (7%).

In this scenario, there is also a decrease in the level of socio-economic development of the region by 12%, a slight increase in dysfunction and fraudulent activities. This scenario cannot be regarded as the most effective.

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Scenario 2

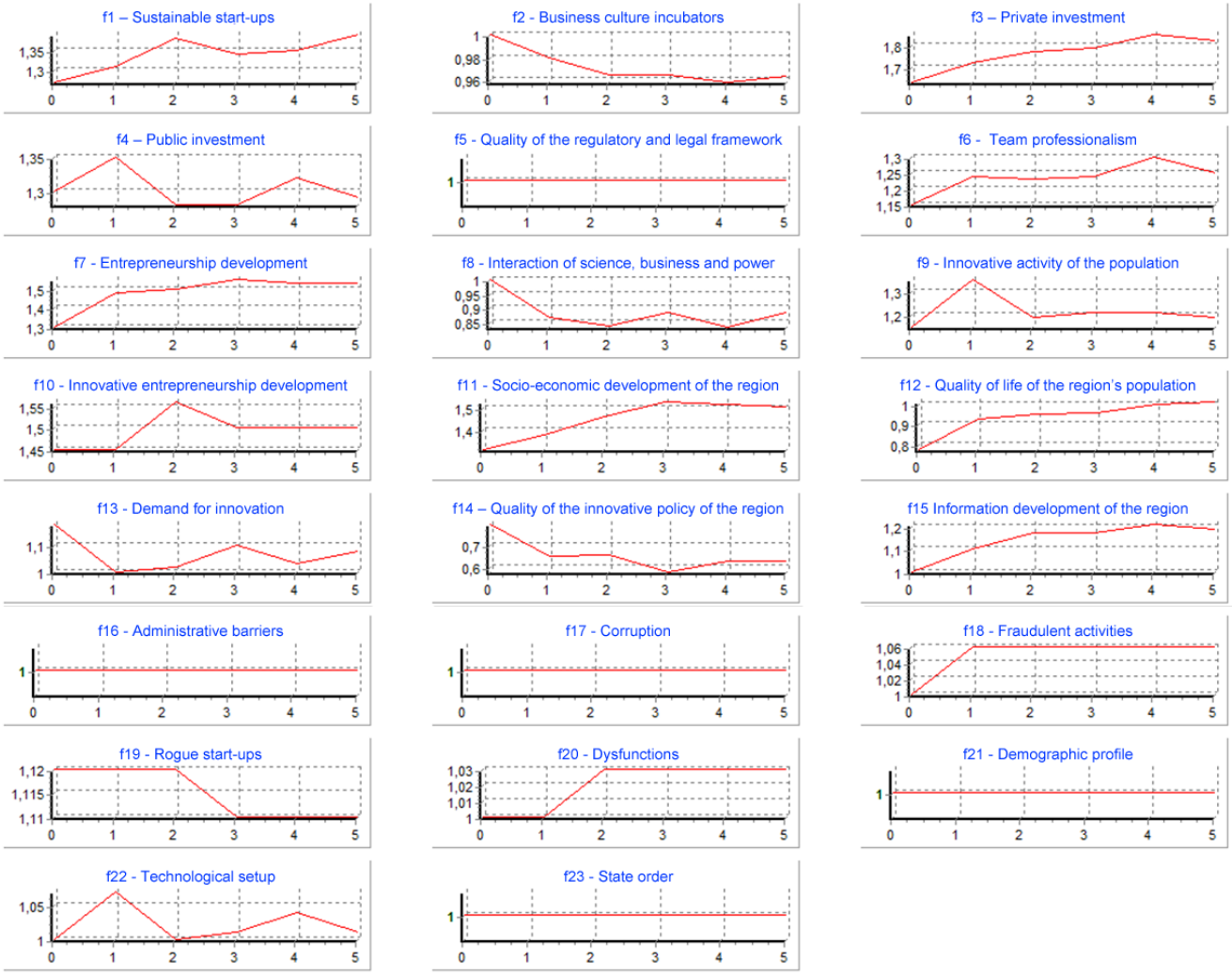


Comment

This scenario allows for conclusion that the number of the sustainable start-ups will grow by 16% in six years; however, the number of the rogue start-ups will decrease monotonically by 0.5% per year. Social and economic development will grow by 50% in six years. This scenario can be considered as acceptable, but it does not ensure a reduction in the level of corruption, administrative barriers and the growth of state orders, despite a slight decrease in fraud (1.75%) and dysfunction (0.4%). Therefore, it cannot be regarded as the most effective one.

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Scenario 3



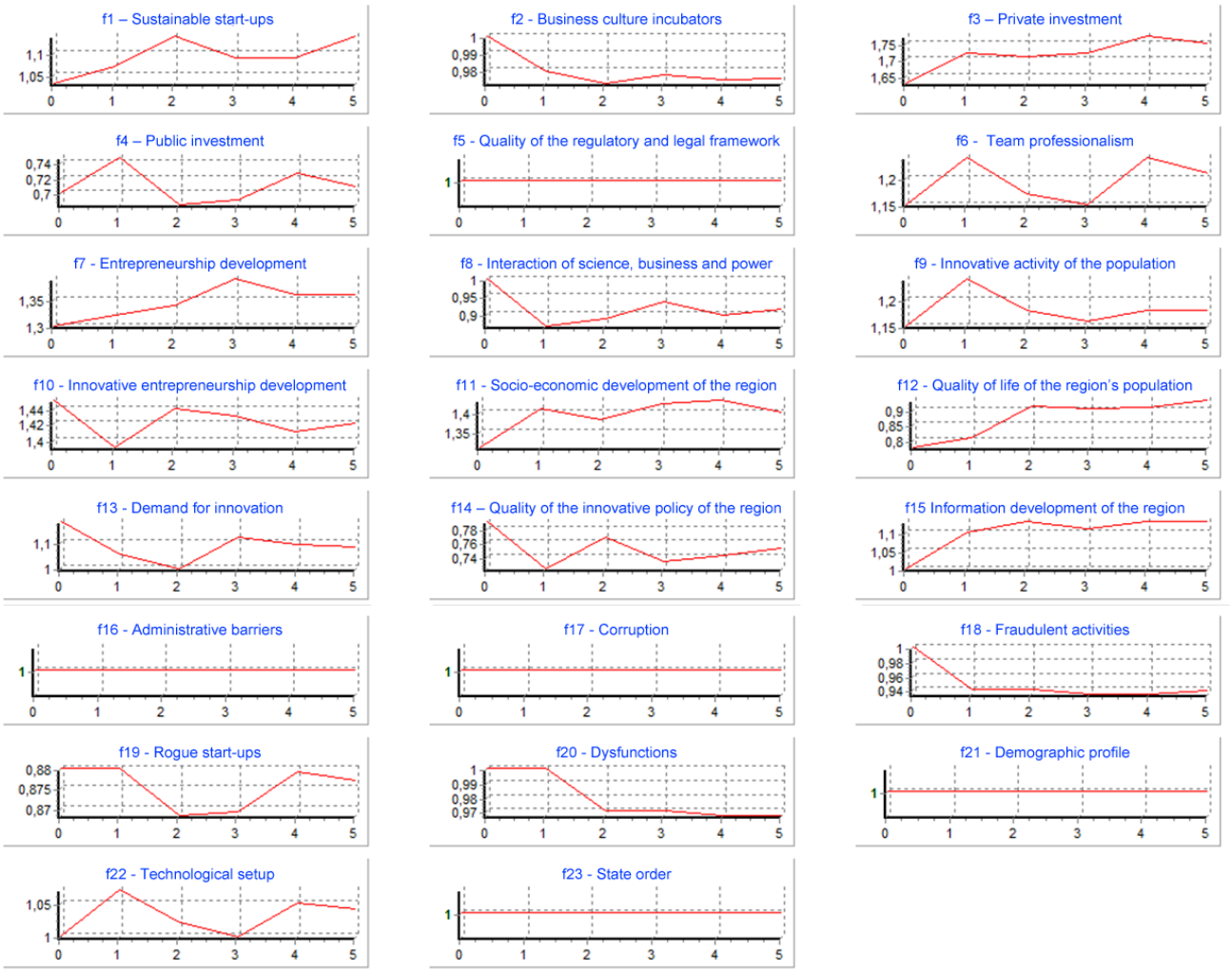
Comment

The analysis of Scenario 3 enables to state a monotonous growth of the sustainable start-ups (by 33% over the period under review), with a simultaneous decrease in the number of the rogue start-ups by 2.7% and some slowdown at the end of the period.

Other factors show a positive upward trend: entrepreneurship development (50%) and innovative entrepreneurship development (40%), interaction of science, business and power (60%), social and economic development (46%), quality of life of the population (30%). However, this scenario cannot be considered as the most effective, since it does not ensure a reduction in the level of corruption, administrative barriers and fraud, and the growth of state orders.

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Scenario 4

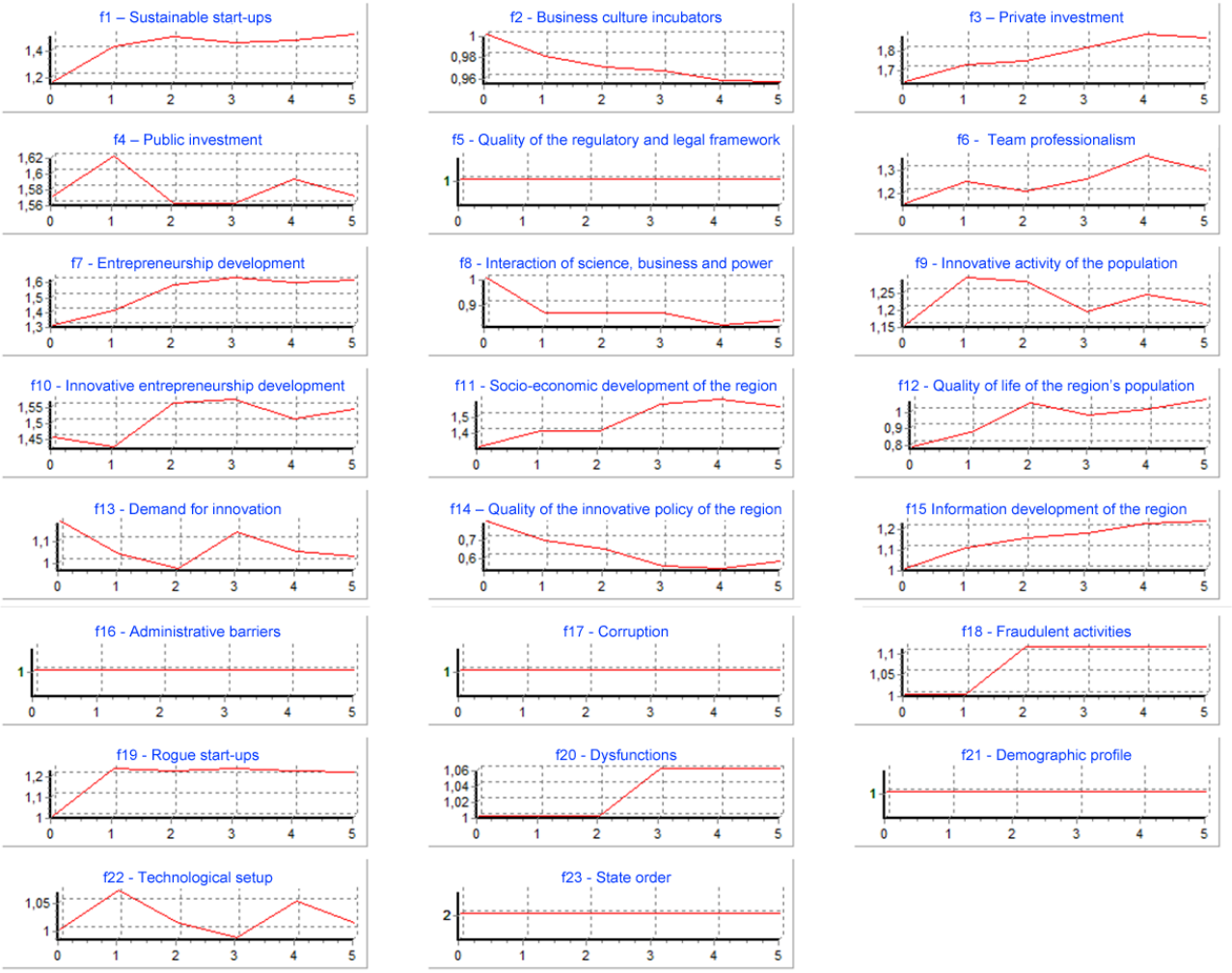


Comment

This scenario leads to the growth of the main socio-economic indicators of the region: sustainable start-ups (35%), entrepreneurship development (20%), the innovative entrepreneurship development (29%), interaction of science, business and power (50%), social and economic development (25%), public investment (42%), as well as to the reduction in the number of the rogue start-ups, dysfunction, and fraudulent activities. It contains resources for the further development of entrepreneurship, which are a consequence of the private business development (i.e., growth in private investment and tax revenue). Nevertheless, in modern conditions it is difficult to expect the outstripping growth of private investment in the economy of the region. In addition, this scenario does not ensure the reduction in the level of corruption, administrative barriers, and the growth of state orders (Orlova, 2017).

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Scenario 5

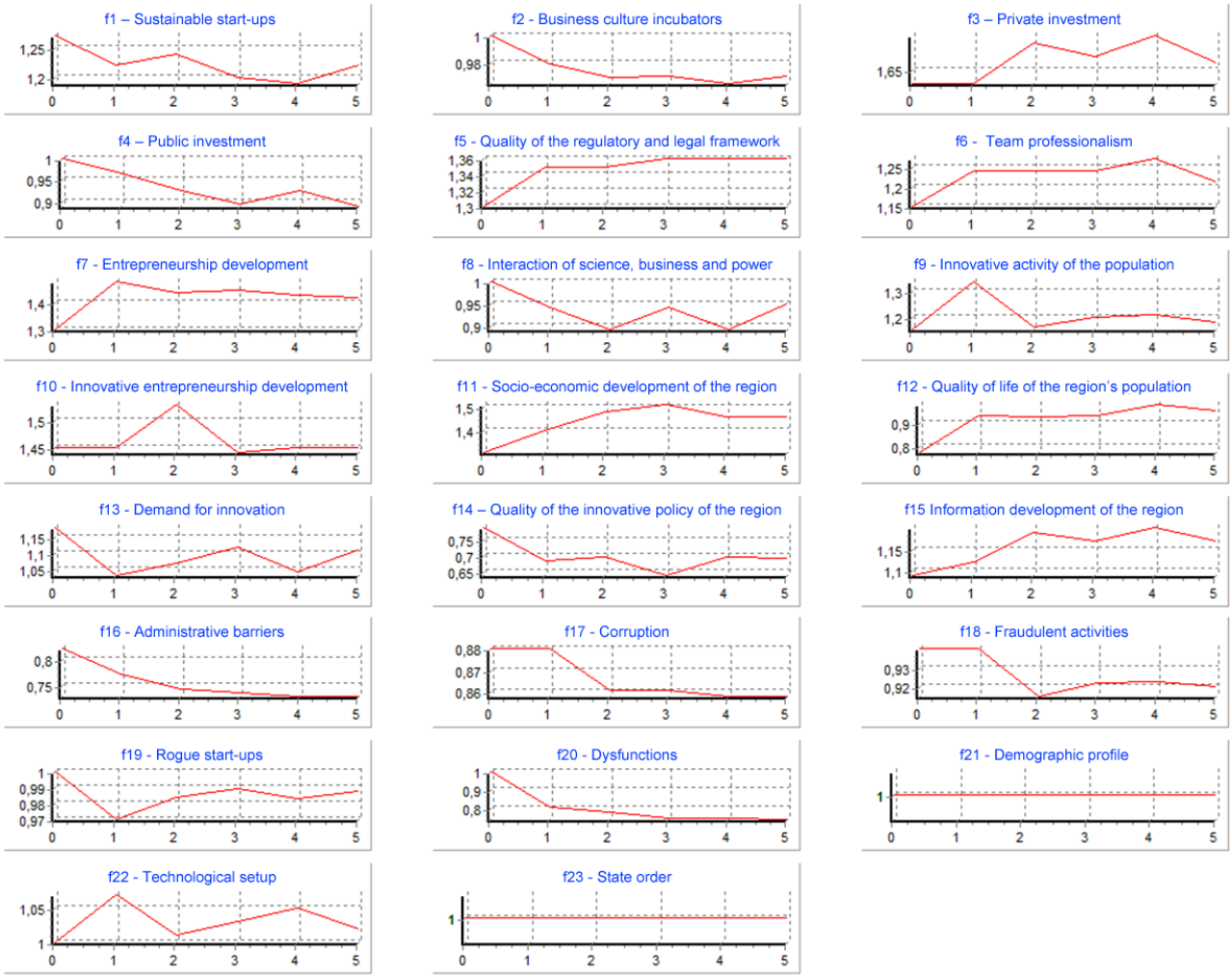


Comment

This scenario leads to the growth of the main socio-economic indicators of the region: sustainable start-ups (60%), entrepreneurship development (23%), the innovative entrepreneurship development (43%), interaction of science, business and power (60%), public investment (52%), social and economic development (50%), quality of life of the population (24%), as well as a slight (from 1% to 4%) decrease in the number of the rogue start-ups, corruption, fraudulent activities and administrative barriers. It contains resources for the further development of entrepreneurship, through the development of private business (i.e., growth in private investment and tax revenue). Nevertheless, a change in the regulatory and legal framework can adversely affect both the development of private business and the growth of state orders that stimulate the development of the economy of the region.

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Scenario 6



Comment

This scenario can be considered as one of the most effective, since the basic socio-economic indicators tend to grow, and the main negative factors tend to decline (corruption, etc.). The drawback of this scenario is related to the fact that it leads to the reduction in private investment: drastic changes of the regional legislation can contribute to this circumstance because private business may need time to adapt to the new regulatory framework.

For the Samara Region, scenario 4 is the most effective scenario for the growth of the basic socio-economic indicators of the region in the conditions of the invariable quality of the regulatory and legal framework. The number of the sustainable start-ups will grow by 35% and the number of the rogue start-ups will decrease by 3% over 6 years.

The quality of innovation policy will increase (by 29%), as well as the level of informatization of the region (by 23%). Entrepreneurship development will accelerate by 20% (i.e., the number of small and medium-sized enterprises will increase); innovative entrepreneurship development will grow by 29%; interaction of science, business and power will improve by50%; there will also be increase in technological setup (by 40%) and in social and economic development (by 25%). The quality of the technological setup, growing with an unchanged demographic profile, suggests that the economic growth is realized in this scenario through the

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introduction of advanced technologies, rather than through an extensive increase in the number of the employed.

The team professionalism will grow by 60%, as well as the innovative activity of the population (by 60%) and the quality of life (by 60%). The demand for innovation will increase significantly (by 250%).

This scenario contains resources for the further development of entrepreneurship, which are a consequence of the private business development (i.e., growth of private investment and tax revenues) and the growth of investments: private investment will increase at an average rate (by 27%), and public investment will grow by 42 %.

Nevertheless, there is a weak development of business culture incubators (an increase by 5%), a low level of fraud reduction (8%) and a level of dysfunction (by 4%). This scenario does not provide the reduction in the level of corruption, administrative barriers, and the growth of state orders.

5. Discussion

The most important tasks of the state policy in supporting innovative entrepreneurship are to create a positive environment for the formation of an integrated innovation sphere of the country, organically covering the entire set of innovative structures; to form an effective innovation infrastructure that provides favorable prerequisites for the establishment and operation of innovative start-ups in a competitive market (Orlova & Afonin, 2015). The development of innovative entrepreneurship in the region is directly related to the formation of the regional system of support for innovative entrepreneurship, including through the development of business start-ups (Abernathy & Uttenback, 1978).

The cognitive model developed within the framework of this study is based on a number of conclusions reflecting the features of modern start-ups and their interactions with the external environment.

1. Operation, effectiveness of start-ups leads to a decrease in the number of sustainable start-ups, to the emergence and growth of the number of the rogue start-ups that imitate business activity under the influence of such factors as corruption, administrative barriers and fraudulent activities.

2. Public investment, being associated with non-transparent administrative permits or bans, can contribute to increasing the share of the rogue start-ups. Private investment, being less connected with non-transparent administrative permits or bans, promotes increasing the number of effective, sustainable start-ups and can contribute to reducing the number of the rogue start-ups.

3. The quality of the regional legislation is a factor of the regional environment, which can affect directly the reduction of corruption, administrative barriers and fraud in the sphere of start-ups' activity. The active competitive environment of small and medium-sized business, innovative entrepreneurship, an increase in demand for innovations in the region are indirect factors that also ensure the reduction of the above mentioned negative phenomena.

4. The external environment has a significant reverse effect on the innovative start-ups. Thus, informatization promotes the growth of innovative activity of subjects of innovative development in the region. Globalization increases the transparency of the region, the level of external competition, which contributes to the growth of innovative activity. At the same time, there is a growing threat of information security, crime, terrorism, "brain drain", which negatively affects the innovative activity of subjects of innovative development.

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Conclusions

Summarizing the above, the following conclusions can be drawn as to the impact of innovative start-ups on socio-economic regional development:
- based on analytical and statistical data, expert assessments 23 key factors have been identified that show the influence of start-ups on regional development and the reverse impact, and groups of factors with a weak, moderate, strong influence were distinguished;
- the factors of the experimental cognitive model and the statistical indicators characterizing the regional social and economic development have been compared. This comparison is accompanied by the results of correlation analysis for quantitatively measurable factors;
- predictive scenario modeling of the effect of start-ups on regional development has been made. For the Samara Region, scenario 4 is the most effective scenario of "asymmetric" investments (private investment is growing at an average pace, and public investment is declining slightly), followed by scenario 6 (growth of private investment while improving the regulatory and legal framework).

Functioning of the regional innovative system enables to create actual economic conditions for effective organization of innovative entrepreneurship, increasing innovative activity and creating a favorable innovation environment, which in turn contributes to sustainable development of the region as a whole.

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WATER AS FREEDOM IN THE BRAZILIAN AMAZON*

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Abstract. Universal access to the commons, such as to clean water, might be seen as a strong challenge to development as freedom. Beyond water scarcity, several regions are already suffering from lack of access, even where water is abundant. Meanwhile, climate change, overpopulation and agricultural demand are severely affecting the quality and availability of water resources. At the global level, concerns about water are tied to the Amazon Region, which contains the greatest potential water stock in the world, and which simultaneously faces the worst troubles in access and supply. This paper is therefore aimed at pointing out the role inclusive social innovations can play in mitigating the impact of growing water shortages and securing effective water use. After a first introduction to Brazil, Amazonas and Parà state statistics on water-related aspects, the research focuses on results emerging from the AguaSociAL project.

Keywords: Brazilian Amazon; water management; natural resources; social innovation; freedom

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JEL Classifications: Q25**,** Q53, Q55, Q56, Q57

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1. Introduction

According to Schopenhauer (1818), the Veil of Maya disguises reality, preventing the observer from focusing clearly on the object. Often, economists make the same mistake when they pay attention only to tools, rather than targeting ideas. Behind the policies and instruments adopted there is the Weltanschauung—visions of the world that could differ from one another. Even John Maynard Keynes, in his masterpiece, underlines the importance of the effects ideas produce in all aspects of daily life (Keynes, 1936, pp. 383-384). Indicators and policies are not "technicalities," since they are the direct expression of a chosen framework. Gross domestic product (GDP), for instance, derives from a target framework that identifies production as the driving force behind well-being and development. Changing ideas might not be sufficient since, before becoming policies, ideas are filtered by institutions (De Muro et al., 2013). If institutions are old or unfit for the context in which they operate, then ideas, even the most successful ones, will not become good policies. Therefore, attention should be paid to ideas and institutions, rather than to debating, often without concrete results, individual tools and instruments (Monni, 2013).

Economics cannot provide a single answer to complex and interrelated issues, since their implications go beyond mere "economic growth" or "gross domestic product" arguments. A new development paradigm should take place with a strong interdisciplinary approach and the capacity to answer correctly to similar emergencies. Specifically, introducing innovative and discontinuous elements from former solutions adopted can represent not only a simple process of technological innovation but also, and foremost, an actual "social innovation".

Therefore, when talking about water issues, technologies and management models should necessarily take into account social arguments as well as rethinking a more traditional planning methodology, aiming at granting populations better access to water resources and at improving the quality of this essential element of people's well-being. Such an approach opens new possibilities and perspectives on management, research and evaluation of innovation processes.

The present paper aims to point out the results achieved by AguaSociAL, a project focused on "Social Innovation in the Water Treatment Sector in the Amazon"†. In order to do so, in the second and third chapter economic growth and development indicators will be provided, both for Brazil and the states of Parà and Amazonas. The research will then analyze the key role of water in development processes. In the fifth chapter, this paper will be engaged with the study of social innovations in water treatment. Finally, results and conclusion will be discussed.

2. Brazil between economic growth and development

Brazil began the new millennium with a sense of uncertainty. However, since 2003 president Lula has focused policy on fostering public and private investments in energy and transportation by raising taxes. In addition, he fostered the significant expansion of credit by state-owned financial institutions and set a wide net of social programs in order to push so-called *demand-led growth* by means of redistribution. This model of expansion of the market, substantially based on consumerism, was based on internal mass consumption and exportation of primary goods (Morais and Saad-Filho, 2012).

† For more information see: https://cordis.europa.eu/project/rcn/111055_en.html

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However, after the financial crisis of 2008, in which the BRICS countries suffered less than other hegemonic poles like the United States and European Union, Brazil quickly recovered thanks to the accumulated reserves and the prospect of continuing favorable prices for internal commodities.

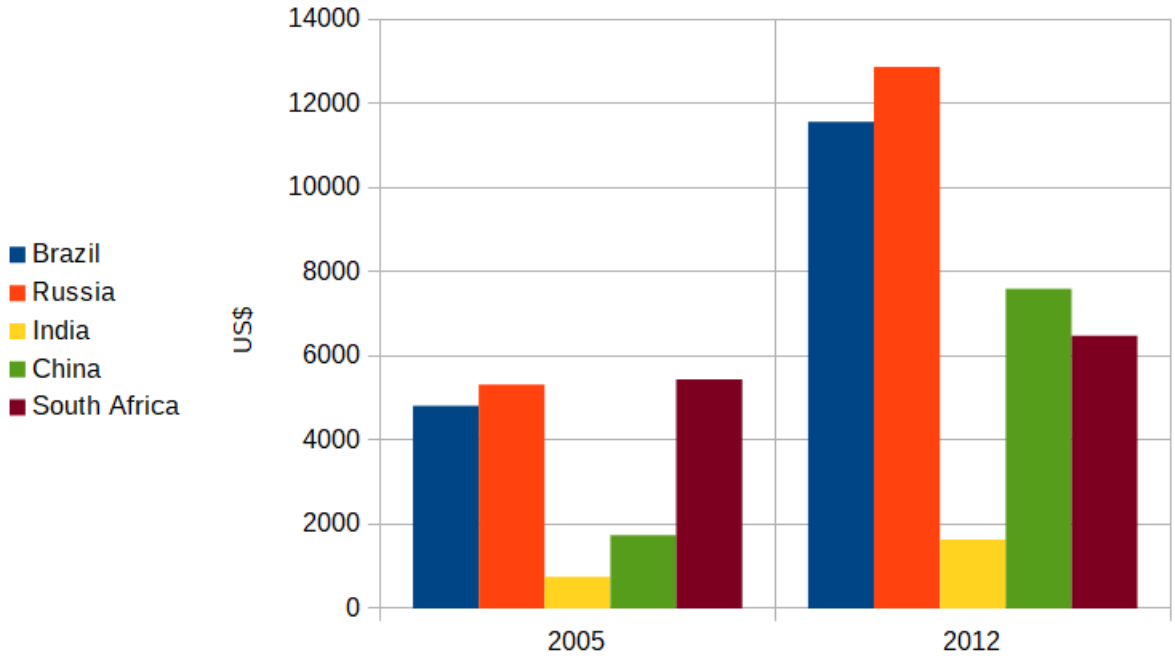


Fig.1. Gross Domestic Product per Capita (Current Prices) in BRICS countries
Source: Personal elaboration from BRICS Joint Statistical Publication, 2015

However, at the end of the commodities boom the country found itself with a stagnant economy and a population clamoring against the high cost of living, revealing insufficient public services (Contipelli, 2016). In the second decade of the third millennium, economic performance was not as positive as in previous years. In 2011, the year the Rousseff mandate (2011-2014) began, GDP growth fell from 7.5% (in 2010) to 2.7%. It contracted by 3.8% in 2015, and was expected to fall at least 3% more in 2016 (World Bank, 2016).

In fact, although Brazil succeeded in lifting more than 28 million people out of poverty and inequality (MDS, 2011), the rate of reduction of those two indicators appears to have stagnated since 2015 (World Bank, 2016). According to the OECD (2015), Brazil's Gini index has kept falling since 2000, but its value remains around 0.6 points, a score in line with BRICS performances but higher than the OECD average (Gomes e Da Cruz, 2016). After more than ten years under leftist governments, Brazil has to face two main paradoxes: the first is related to public expenditure, since the Brazilian government is not yet able to offer high quality services; the second is the fact that Brazil didn't take proper advantage at the opportune moment to implement structural reforms, and instead concentrated its efforts on commodities trading (Contipelli, 2016). However, historical and current evidence suggest that income inequality concomitant with a rise in economic growth can be limited and reduced by political reforms (Cavalcanti, 2014; Tvaronavičienė, Gatautis, 2017). In this process, social participation and democracy are very important; political freedom is highly valued as pivotal in the achievement of human development (Sen, 1999).

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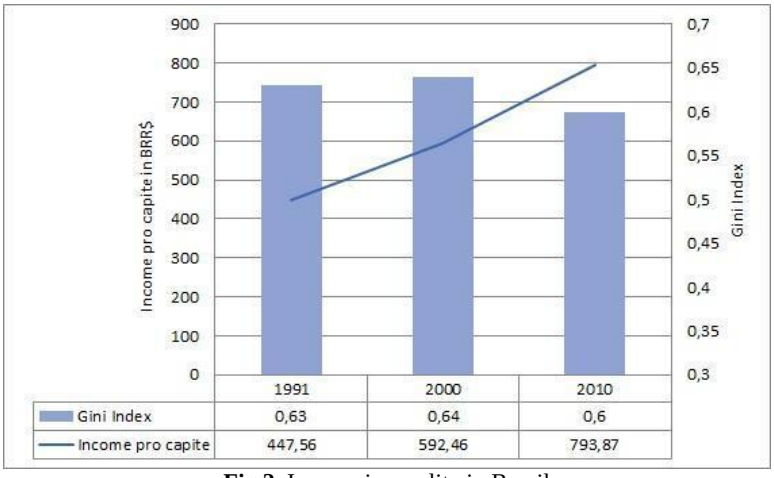
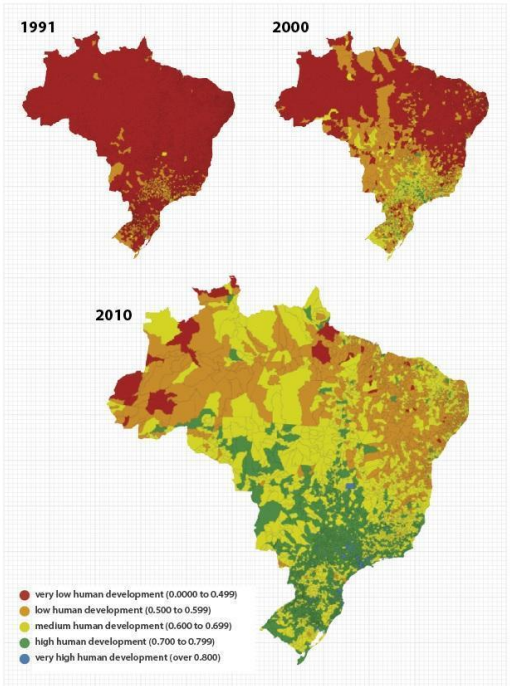


Fig.2. Income inequality in Brazil
Source: Personal elaboration from IBGE data on Brazilian census, 2013

In this view, both high public services and low inequality (that is, fair income distribution) are influent on the development of a country.



Map 1. Human Development Index in Brazil
Source: Instituto Lula from UNDP; FJP; IPEA

Nevertheless, Brazil remains one of the largest exporters of raw materials in the world and its case is emblematic of how investments may produce income concentration (centers of extraction) without really positive affecting the country's development as a whole. According to the Human Development Report (UNDP, 2016), Brazil has a high human development value (0.754), positioned at 79 out of 188 countries and territories considered. It scored

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above average for the Latin America-Caribbean area. However, it must be take into consideration that there are still huge gaps in the distribution of human development across the national population, as shown by Map 1.
The imbalance between extractive costs and revenues from the use of natural resources not only concerns Brazil's relationship with foreign commercial partners, but rather represents an internal North-South dynamic (Costantini and Monni, 2008 a. and b.; Cori, A. and Monni, S., 2015). From this point of view, the case of the Brazilian Amazon clearly reveals a reckless use of natural resources (e.g. the use of water for national hydroelectric production) (Pinto, 2017). Development of the Amazon is then driven by a national project constantly threatened by external pressure (i.e. big international capital). This draws a framework of perpetrating both social and political exclusion, preventing a project of real inclusive national development (Domingues, 2002).

3. Amazon State and Parà between economic growth and development

The uneven trend between growth and development occurs at the level of Federation as much as of macro regions. For instance, the Brazilian Amazon, which area includes the North Region plus Mato Grosso and Maranhao, is rich in natural resources, whose exploitation has strongly influenced the economic growth of the area for decades, especially in terms of energy production (Table 1). Amazonia Legal corresponds to 64% of the Brazilian territory and stands out in the economic scope by virtue of its vegetal and mineral extractivism, agriculture and fishery. It presents high income inequality, despite being below the national average (SUDAM, 2016).

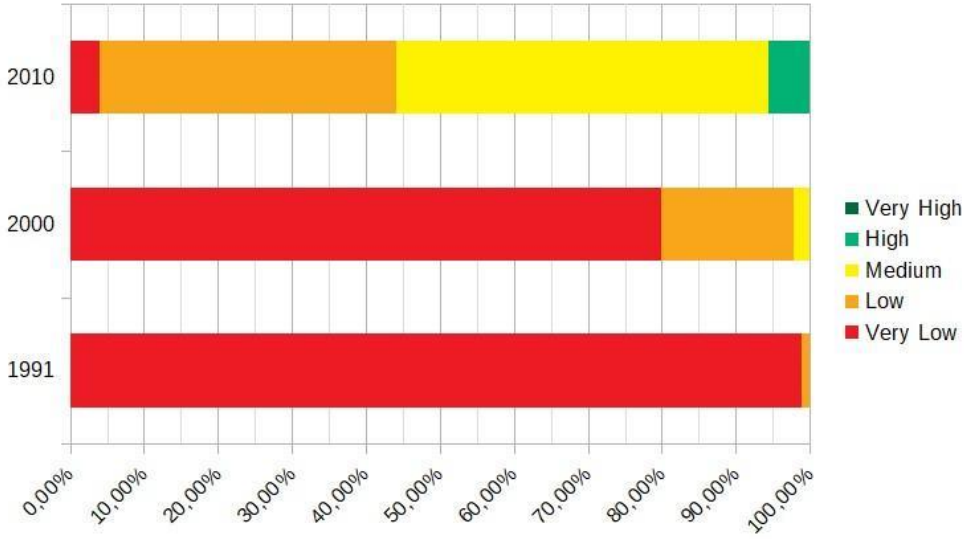


Fig.3. Distribution of Municipalities by level of human development (North Region)
Source: PNUD; FJP; IPEA, 2013

However, the average score of the human development index within the area is still one of the lowest in the country. With five to seven states belonging to the medium human development zone, the North Region scored just 0.667 on the human development index in 2010; it also houses Melgaço (Pará), the municipality with the worst human development index in the country (0.418) (Figure 3). As far as human development is concerned, it is noteworthy that the Amazon has been the subject of national development projects since the seventies, owing to its enormous availability of resources. The Grande Carajàs program, launched in the 1980s in the state of Parà, is a classic example of a "sectoral" program, including the implementation of various regional investments. Among others, the iron and aluminum extraction and refining industry of Barcarena has been active since 1985, while the hydroelectric power plant of Tucuruì has been active since 1984, and was built with the objective of supplying energy to the abovementioned foundry. Nowadays they have both a massive role in the national production of

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refined aluminum and hydroelectric energy, respectively, while the state of Parà has shown increasing participation in the national GDP. In fact, in 2014 it provided for 40.44% of the North Region GDP, covering 2.16% of the National GDP (Fapespa, 2016).

The second state of the North Region in terms of GDP is Amazonas. After decades of successfully exploiting rubber and other natural resources, since the seventies the federal government has encouraged growth by creating the Industrial Pole of Manaus. The main goal of the project was to accelerate the industrial revolution in the region and nowadays the industrial park has a diversified production, with prominence for electrical materials, even though both in Amazonas and in Parà extractivism still represents a strong part of the local economy, while agricultural production is mainly focused on traditional but strategic cultivations such as rice, cassava and tropical fruits.

States (Federation Units)	Electricity Production Gwh*		
	2011	2012	2013
Acre	203	377	234
Amapá	1.566	1.704	1.816
Amazonas	9.036	9.561	9.970
Maranhão	1.943	3.621	11.181
Mato Grosso	7.200	10.802	12.361
Pará	43.092	41.217	41.191
Rondônia	3.214	4.173	6.407
Roraima	133	128	169
Tocantis	10.650	12.747	11.881
Amazônia	**77.037**	**84.330**	**95.210**
Brazil	**531.758**	**552.498**	**570.025**
*including self-production			

Table 1. Energy Production in the Brazilian Amazon—electricity
Source: Personal Elaboration from SUDAM 2016, MME 2011

However, the strong participation of foreign investments in the case of Manaus, together with the creation of the energy pole of Parà as a means for national development, lays the ground for a further discussion about the real impact of growth on local development.

In fact, sectoral projects of national interest are usually considered capable of boosting both growth and development of so-called peripheral areas. However, the results in terms of development in the North Region, although in line with the country's performance, do not exactly meet expectations. The non-synchronous trend of development of the North Region with respect to the country as a whole provokes reflection. Although sectoral programs usually absorb greater funding than regional projects, satisfactory results for the national economy keep pace with the escape of benefits out of the local context. The flux has a double direction, local to national as much as local to abroad (in the case of revenues from the industrial pole of Manaus).

The economic growth of the country is not always able to drag local development with it, as in the case of the Amazon Region. Similarly, national development strategies in Brazil seem not to be able always to drive the

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regional development process without increasing internal core-peripheral dynamics (Magalhaes, 1987; Furtado, 2000).

4. Water as Freedom: a key issue for better understanding Brazil

In 1999, Amartya Sen wrote about the concept of development as the process of expanding the freedoms that people enjoy. Policies should be aimed at removing major sources of "unfreedom": poverty, tyranny, poor economic opportunities, social deprivation, and neglect of public facilities, as well as intolerance (Sen, 1999). Access to clean water, for instance, should be one of those forms of "unfreedom" tackled and eradicated, due to its key role in human activities. Indeed, it has been argued in the 2018 United Nations World Water Development Report that clean water has a crucial role in achieving SDGs, and more generally in implementing development processes. More specifically, clean water, not just an end in itself (SDG 6—ensure access to water and sanitation), has an impact on sustainable agriculture (SDG 2), healthy lives (SDG 3), building resilient infrastructure (SDG 9), sustainable settlements (SDG 11) and disaster risk reduction (SDG 11). Moreover, this report highlighted the relevance of water scarcity mitigation policies (UN, 2018).

The relevant literature agrees that water scarcity has three main dimensions: physical, infrastructural and institutional. As far as physical water scarcity is concerned, estimates show that a withdrawal rate, on average, above 20% of renewable water resources would put "substantial pressure" on water resources, while reaching 40% or more would be "critical". Moreover, as in the case of Brazil, where water may appear abundant, much of it is not accessible due to natural (e.g. deep within the Amazon Forest) or engineered (e.g. use for energy purpose) causes (UNDP, 2006).

4.1 Land use of water

Present projections indicate that the world population will increase from 6.9 billion people to 9.1 billion by 2050 (United Nations, 2009). At the same time, food production will also grow by about 70% globally and by 100% in developing countries (FAO, 2011). When looking at data on the world's cultivated areas, numbers follow the same trend: lands dedicated to agriculture have grown by 12% over the last 50 years, while irrigated areas have more than doubled in the same period (FAO, 2011). Even if some major improvements have been introduced in the sector, agriculture still uses 70% of all water withdrawn from aquifers, streams and lakes, posing the key question of sustainability. Total water withdrawals still represent only a small share of all internal renewable water resources, but these figures have major regional discrepancies (FAO, 2010).

In fact, Spera et al. (2016) have underlined the considerable implications for water cycles that Brazil is facing. In particular, the study showed that in some areas in Brazil, such as the Amazonian and Cerrado areas, cropland agriculture doubled, changing from 1.2 to 2.5 million ha, with 74% of new croplands sourced from Cerrado.

4.2 Urbanization

The latest trends clearly show that 40% of the global rural population now lives in river basins that are physically water scarce (FAO, 2011). At the same time, urban areas are forecast to grow, by about 1.4 billion to 5 billion between 2011 and 2030. By 2050, 70% of all people on earth are expected to live in an urban environment (World Water Council, 2015). Notably, an increase in urbanization will affect mainly developing countries such as Brazil, and will feature the rapid growth of small and mid-sized cities, alongside the development of new urban areas. In Brazil, the percentage of the population living in urban areas has constantly increased from 1950, reaching more than 85% of the total population in 2018 (UNDESA, 2018). In particular, looking at disaggregated data on urbanization trends in Brazil, all typologies of urban settlements are experiencing an increase in numbers:

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currently, there are two cities with 10 million (or more) people, and 19 cities with 1 to 5 million people (seven more than in 1990) (UNDESA, 2018).

From a water perspective, urbanization could negatively hit water resource-intensive development paths over the next decades, excluding more people from access to drinkable water sources. Challenges to water infrastructure and water resources management could develop steadily, and cities need to adapt to these ever-changing social and economic circumstances, promoting inclusive and innovative ways to secure access to safe and drinkable water. As far as the Amazon goes, the increasing trend of urbanization is leading to a rising consumption of natural resources, especially water, for various purposes (Rocha and Neves, 2018). However, the greater the consumption, the greater the pollution of water, due to the urban context, which results in a worsening of surface water quality. The real challenge to the Amazon Region is therefore the creation of treatment systems, together with the boosting of the still unfeasible sewage systems.

4.3 Climate change

As briefly mentioned, climate change not only affects weather conditions and human lives, but could also affect demand for and availability of water resources. There is an overall agreement on the scale of global warming and the effects on the hydrological cycle (IPCC, 2008). Precipitation, receding glaciers and melting permafrost could hit seasonal flows, causing longer dry periods that, in turn, are likely to reduce groundwater recharge and water supply for agriculture, energy production or navigation (United Nations—Water, 2010). Furthermore, rising sea levels will have problematic effects on coasts, putting many cities under stress, as well as straining food production in major delta regions that, in some cases, are the main source of food supply.

According to the Brazilian UNESCO office (2014), Brazil still faces problems related to climate change and without proper mitigation policies the situation will get worse. It has been emphasized that in Brazil, water will be the first resource affected by climate change (UN Global Compact, 2017). Scholars and researchers underline that human perturbations, which are altering the correct functioning of the Amazon ecosystem, are especially affecting the Amazon hydrological cycle (Andreae et al., 2015). Since the Amazon is pivotal within the global ecosystem, due to its abundance of biodiversity and amount of water, deflection in rainfall patterns and in amount of rainwater, the main effects from human activity, are going to damage agriculture and fluvial transportation, among other activities, not only in Brazil, but also in other countries as well. In the same way, the increasing presence of algaes and the shift of vegetation in the Amazon may induce a change in the human use of water, even if in this case scientific evidence is still not unanimous (Cardoso et al., 2018).

4.4 The fight for water

Most of the water in the Amazon region is polluted and only 20% of consumed water is treated, but just 73% of the urban population have real access to treated water, while the percentage for the rural population is dramatically smaller, at just 24% (MMA, 2006). Increased competition for water resources could lead to social and political turbulence, resulting in conflict. Water scarcity and unfair supply could be a destabilizing factor in emerging countries like Brazil. Competition for water could represent a potential source of instability due to population increase and, most of all, to large-scale acquisitions of cropland (FAO, 2011). It has been argued that in the next years Brazil will face inadequate budgetary and financial resources to respond to the water crisis. This will create increasing conflicts between economic development and conservation and sustainable use of environmental resources, creating more deprivation in the already deprived areas of Brazil (UNESCO, 2014). The Amazon Region is featured due to the interaction between natural resources, water resources and human use. However, the abundance of water coexists with scarcity, since plenty of water does not imply an easy and fair supply to communities (Muniz et al., 2018, De Melo et al, 2018; Schiffer et al., 2018).

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4.5 Brazilian water abundance

In terms of dimensions, Brazil is the fifth country in the world for diversity and size of population, as well as natural resources. An estimated 20% of global biodiversity is found in Brazil, which is the home to more than 100,000 animal species and about 46,000 plant species (Secretariat for Social Communication Presidency of the Federative Republic of Brazil, 2012).

Due to its extremely vast territories, Brazilian authorities have divided the country into six biomes, with the Amazon being one of the most important areas. The Amazon is the largest tropical forest in the world—touching nine different countries—with 4 million square-kilometers coverage and high rates of biodiversity. Most of the Amazon region is situated in Brazil, and its rainforest is well-known in terms of biodiversity and fresh water production (Caravaggio and Iorio, 2016).



Map 2. Map of South America (Water Basins) including the Amazon Basin (in light blue).
Source: CNN https://edition.cnn.com/travel/article/river-maps-art/index.html?gallery=1

Brazil is a water abundant country, with about 12% of the world's freshwater resources, and some of its largest water basins, as, for instance, the Amazon, Paraná and São Francisco river basins (Map 2). The average annual water flow amounts to 260,000 m3/s (ANA, 2016).

Even though total water extraction amounted to only 0.9% of total available fresh water (based on 2010 data), the figures are constantly increasing—by almost 30% over the past five years—reflecting Brazilian trends in demographics and economic development (Formiga Johnsson, 2014).

Nevertheless, populations do not have the same access to water. A large share of the nearly 13 million households that remain without access is concentrated in the North and Northeast regions of Brazil, where only half of the households were connected to piped water (OECD, 2015). Several factors are causing or exacerbating this particular issue: the lack of attention in protecting and conserving water, under-investment in necessary upgrades to water infrastructures, geographical disparities, and so on.

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In addition, water pollution remains critical in most of the country, especially in the Amazon region, where, despite the abundance of water supply, there is a lack of drinkable water for human consumption. Domestic wastewater discharge is the main problem affecting the quality of surface waters, as only half of domestic sewage is collected and less than 40% is treated (IBGE, 2011). As a result, issues concerning was quality and access strongly affect social life and public health in the region.

Possible solutions need investments to improve technologies and to implement them, strengthening skills and capabilities and realizing participatory processes to convey knowledge transfer and generate awareness.

5. Social innovation in the Amazon water treatment sector

In 2013 the AguaSociAL project arose, trying to face and discuss the abovementioned matter of water. It fits perfectly in this context and the European Union, under the Seventh Framework Programme (FP7), financed it within the International Research Staff Exchange Scheme (IRSES) Marie Curie Actions that aims to consolidate knowledge cooperation and knowledge sharing, in relation to water issues, between Brazil and the European Union. The principle of social innovation lays the foundations of a project that aims to enhance practical use of research and to support the creation of new paradigms related to water resources treatment in Pará and Amazonas states (within the Brazilian Amazon region). AguaSociAL has brought together early-stage and experienced researchers, as well as technical and managerial staff, in interaction on the field with local communities, in order to implement the participatory approach which is the basis of social innovation. Researchers involved had the benefit of onsite training during their whole period of secondment. By emphasizing cross-disciplinary training, the project enhanced the scientific excellence of the cooperating partners.

5.1 AguaSociAL: results from the field

In the first phase of the project, many exchanges occurred between the actors involved in AguaSociAL. On the one hand researchers and professors from Brazilian universities participated with working teams, giving and attending seminars and workshops at the universities of Rome, Leeds and Barcelona. On the other hand, European partners had the opportunity to do field work in the Amazon.

Interestingly enough, several side activities emerged from AguaSociAL, such as the creation of working groups involving bachelor, masters and Ph.D. students from the partner universities (Monni, 2015).

The field of natural resources, together with the focus on water resources represents an interesting and broad field to be explored through different approaches applied by researchers from different countries.

The use of water as an energy resource led to copious research on the hydroelectric sector. Economists applied cost-benefit analysis to hydroelectric investments at the national level, analyzed the correlation between energy production and economic growth, and also studied the variables of economic growth, a few of which were correlated with the development process. Geographers and sociologists tried to follow at the local level urban and rural dynamics resulting from the construction of big-impact infrastructures such as dams. Territorial governance, a participation approach and the creation of human capital providing help to the local and regional administration of both territory and energy production are other socio-economic questions arising in the broader legislative field. Hydroelectricity, one of the cleanest technologies in the world, calls attention to the need to guarantee a better and higher regulation of water resources, especially in a remote area such as the Amazon. Water use for the production of energy is allowing Brazil to increase its energy independence from the rest of the world, with a significant further reduction of climate-change emissions, despite growing national consumption of energy. Nevertheless, indiscriminate use of water resources, even for noble purposes, is generating notable impacts

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socially and environmentally. First, the appropriation of water by public and private enterprises in order to produce energy is complicating, more than simplifying, the spread of access to this precious natural resource, and is damaging mainly local populations (Caravaggio and Iorio, 2015). Secondly, excessive and still growing exploitation of water is causing conflict situations, interrupting water flow that could be otherwise used for transportation and commerce. Lastly, the intervention of both the private sector and the large public companies is mainly focused on energy, rather than on providing basic welfare services. Therefore, local communities are those suffering the most from negative impacts, without receiving particular benefits in terms of well-being diffusion (Caravaggio and Iorio, 2015).

Other water-related matters were debated by taking advantage of the previously developed collaborations and the field work. A consolidated international working team then developed studies concerning water as a common good. Many were promoted by the use of surveys and interviews among local communities, experts and local media (such as regional television channels). From this point of view, European and Brazilian scientists focused on the treatment of polluted water for daily use; rainwater storage and purification systems, not only in urban, but especially in rural contexts, emerged as areas of inquiry to be deepened (Schiffer and Swan, 2018). Forest engineers observed changes in vegetation due to the changes in the original natural path of water, especially around fluvial areas and artificial lakes (reservoirs) in the Amazon Basin (Melo et al., 2018).

Some of the last contributions were developed in 2017, with the main field work carried out in Belém, resulting in deep studies on the development processes of the municipalities' nearby large-scale projects. They highlight how downstream municipalities are usually less developed than upstream ones, raising interesting questions to be answered in further research (Iorio et al., 2018).

6. Conclusions

Water is a pivotal resource for humans and societies, integral to several quite various functions of human life (e.g. nutrition, agriculture, trade, mobility). One of the more important issues affecting the natural and fair use of water by human societies is energy production through hydroelectric plants.

A comprehensive approach, going beyond pure economic and financial figures, should take into account the specificities and the socio-cultural background of the area. Small plants, rather than major projects, could be a possible alternative to the present situation, in which local communities are facing exclusion and even more "unfreedom", to use Sen's word (Caravaggio et al., 2018)

The results of the abovementioned research are nothing but the output of the AguaSociAL program, which underlines the importance of an interdisciplinary approach to development issues. Technical knowledge in scientific fields such as biology, chemistry, engineering and economics, combined with local expertise and awareness, create articulate and deep reflections. For these reasons, cooperation had an important role in the definition of some key challenging goals, and is still proceeding positively. The main goals to be defined in the process have emerged as: "what" are the real problems of the treated region; "where" we can find feasible solutions to these problems; and "how" we can do our best to influence and orient policy making. International collaboration among interdisciplinary teams revealed itself as a precious tool for development: interviews, working groups and multidisciplinary meetings, through a bottom-up approach, contributed to the creation of a consolidated network still working for a sustainable economy that respects local communities and enhances fair and integrated development.

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INTERNAL FACTORS INFLUENCING THE COST OF EQUITY CAPITAL *

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Abstract. In this paper we compile and evaluate the research available on internal factors influencing the cost of equity capital. The topic has been extensively studied for the past few decades; however, the information is spread and is not accumulated. We begin by reiterating the reasons why information asymmetry drives financial decisions. Next, we review recent literature that focuses on financial disclosure and accounting information, i.e. internal factors that are directly connected with information asymmetry. In the remainder of our review we discuss a recent debate on the impact of corporate governance and social factors. Aside from theoretical contribution, the comprehensive literature review of existing studies results in formulation of a strategy how to decrease to cost of equity capital by means of internal factors adjustments. We believe that highlighting the key points in the debate will be beneficial for both academicians and practitioners who will be able to form an independent view of the approaches how to take influence on the cost of equity capital.

Keywords: cost of equity; costs reduction; corporate governance; information asymmetry; disclosure policy; social responsibility

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1. Introduction

The factors of internal environment facilitate the strengths and weakness of a company that in turn affect its development and all company's activities. Compared to the external environment represented by macroeconomic and capital market environment (for more details see e.g. Faldzinski et al., 2016; Zinecker et al., 2016; Lenart et al., 2016; Vukovic et al, 2017; Mazur, 2017; Kovacic & Vilotic, 2017; Pietrzak et al, 2017; Meluzin et al., 2017) a company is able to manage the internal factors while influencing the business processes in order to achieve its targets. The capital management is one of the most significant elements of decision-making process. Moreover, effective financial decisions supported by the information regarding the relation between internal factors, the capital and its cost result as a clue to the stable successful development of a company.

There are many research papers dedicated to different aspects of the cost of equity capital (hereinafter referred to as CEC) management (see e.g., Michalak, 2016; Pieloch-Babiarz, 2017; Tomczak, 2017; Pustylnick, 2017; Dokulil et al., 2017). As a rule the internal factors and their impacts that are analysed by international scientists can be divided into several groups as corporate disclosure, corporate governance, social performance and other financial related performance. The information and its asymmetry are an important link between the CEC and other factors. The influence of variety of internal factors on the costs of equity capital has been extensively studied for the past few decades; however, the information is spread and is not accumulated. As a rule the studies is focused on one factor or a group of related factors.

In this paper we accumulate and evaluate the knowledge on the internal factors influencing the CEC. Because this literature review can represent only a small part of the academic resources, with a focus on very recent articles, we refer the reader to recent surveys by authors listed in references for additional reading.

The rest of this paper proceeds as follows. First, we provide an overview of the methodological approach. Next, we review and discuss the literature on information asymmetry, financial disclosure, accounting information, corporate governance and social factors. Aside from theoretical contribution, the paper provides a practical input in terms of proposals how to reduce the cost of equity in the last section.

We believe that highlighting the key points in the debate will be beneficial for both academicians and practitioners who will be able to form an independent view of the approaches how to take influence on the cost of equity.

2. Methodology

The article is of theoretical-cognitive and methodological character. The research is based on a systematic review of recent academic literature. Kitchenham (2004) reports that a systematic review "is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest". A systematic literature review is a form a secondary study that uses other studies as its data. In this systematic literature review we aim to understand an established but very fragmented topic; this fact justifies relevance of our research (for details see Webster, Watson, 2002; Kitchenham, 2004).

This study has been processed in several discrete activities including planning, defining a search strategy, database searching, selecting studies, synthetizing and expert interpretations – reporting the review (Kitchenham, 2004).

We applied a general approach to the search strategy that includes identifying existing systematic reviews and assessing the volume of potentially relevant studies, trial searchers using various combinations of search terms

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derived from the research topic, reviews of research results and consultations with experts in the field as recommended by Kitchenham (2004).

The main searches for primary studies were undertaken while using international databases as Scopus, ScienceDirect, EBSCO, Emerald and ProQuest Central. In addition other sources of evidence were collected manually in state libraries as Moravian Library (Brno), Library of the Brno University of Technology, Bibliothèque nationale de France (Paris), Dauphine University Library (Paris), Library of the Vienna University of Economics and Business and Russian State Library (Moscow). As the sources and availability of data is crucial for quantitative research then multifold resources are used to collect data.

Once the list of potentially relevant primary studies has been completed, an assessment for their actual relevance was conducted. Inclusion and exclusion criteria were defined to reduce a huge number of potentially relevant studies. Only those primary studies were considered if key words related to the topic were included in 1) titles, 2) abstracts and 3) full paper contents. All passages of the particular text related to the topic were marked and a conceptual model in the form of a concep-tual matrix was created. A list of included and excluded studies was established where the reasons for exclusion are listed. In accordance with Kitchenham (2004) and Tranfield et al. (2003) the data collection matrix provides standard information including date of data extraction, title, authors, journal, publication details and a space for additional notes.

The next step was devoted to a deep literature analysis, where the previous studies are analysed more precisely, in order to identify the existing relations, causes and consequences of the analysed phenomena. Based on the literature research eighteen internal factors were identified that that are reported to have influence on the CEC. Moreover, the findings assist to indicate the significance and direction of this influence.

Hereafter, the analysis and synthesis results are reported. The internal factors are defined as factors associated with corporate activities that can be influenced by corporate managers. The internal factors can be classified in several categories: corporate disclosure, corporate governance and social factors. However, there is one singular factor that can be represented as a linkage between many factors and the CEC: the information asymmetry. E. g., higher corporate disclosure leads to lower information asymmetry that in turn decreases the CEC. The corporate disclosure policy is designed to increase transparency and decrease information asymmetry that in turn is reflected in company's performance. The discloser can be presented as a set of individual factors, but it can include several separate internal factors that have their own degree of influence on the CEC and that were analysed separately in this study.

We believe that our systematic review extends the theoretical knowledge of the investigated subject significantly while accumulating very spread information on factors influencing internal CEC. We first present a review of theories and research approaches for studying internal factors while simultaneously looking for links among them. Until recently, researchers have been only focused on the role of one single factor.

3. Results and discussion

The essence of information asymmetry

The availability of information is an essential factor in the decision-making process regarding the efficiency of resource allocation on micro and macro levels. The inequality of available information between corporate insiders and stakeholders as investors is thought of as information asymmetry.

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Back to Myers (1984) and Myers, Majluf (1984) who argue that information asymmetry drives financial decisions, the situation, when the private information exceed the publicly available information about future corporate performance, leads to higher CEC required by less informed inves-tors. Barron et al. (2012) show that information leads to higher CEC (CEC). In addition, they find that average precision and precision of public information are negatively associated with CEC. At the same time the precision of private information positively influences the CEC, however the coefficient is relatively small. Besides, with lower public information the precision of private information reduces the cost of capital.

Authors also try to analyse information asymmetry and its impact on CEC through different angles. For example, Armstrong et al. (2010) examine the influence of information asymmetry on the cost of capital according the market competition. If market is imperfect, the information asymmetry has a significant effect on the cost of capital; and there is no impact, if there is a perfect market competition. Thus, the studies investigating relation between information asymmetry and the cost of capi-tal, should take into account the level of market competition.

As the information asymmetry is very wide term, the researchers apply different types of proxies to estimate the information asymmetry component in the CEC. The most popular measure among researchers is bid-ask spread (Leuz, Verrecchia, 2000; Armstrong et al., 2010), which represents the difference between the ask price and the bid price of a share. The bid-ask spread refers to the adverse selection problem that emerges in shares transactions with asymmetrically informed investors. Thus less information asymmetry is associated with less adverse selection that in turn leads to a smaller bid-ask spread. The alternative measure of asymmetric information is trading volume, which refers to the liquidity. It represents the willingness of investors to sell the shares or to buy them that in turn is related to the existence of information asymmetry. Another measure as share price volatility also is used as a proxy of information asymmetry (Lang, Lundholm, 1993; Leuz, Verrecchia, 2000; Masood et al., 2017). The smooth transitions in share prices stand for the absence of information asymmetry; the higher level of volatility indicates the increasing information asymmetry between a company and shareholders or even between investors. However, the alternative proxies as trading volume or price volatility might be affected also by other factors than information asymmetry (Leuz, Verrecchia, 2000). Consequently, there can be the combination of several proxies to measure information asymmetry. For example, Armstrong et al. (2010) use five measures to estimate infor-mation asymmetry: two market-based measures as (1) the adverse selection component of the bid-ask spread (ASC spread) and (2) the bid-ask spread; two accounting-based measures as (3) the ratio of annual research and development expense to sales and (4) scaled accruals quality; (5) analyst coverage. The last one represents "the number of sell-side analysts issuing one-year-ahead earnings-per-share forecasts for the firm during the year". The greater analyst coverage might improve the information environment that in turn leads to a lower information asymmetry. As was mentioned before the market-based proxies are widely used among researchers. According to authors the advantage of ASC spread and spread itself is the precisely measurement of the information asymmetry outcome. The existence of information asymmetry results in ASC spread increase. In terms of accounting-based measures the R&D expense represents the intangible assets, which in turn might be associated with information asymmetry. At the same time the higher variance of scaled is associated with lower earnings quality that in turn leads to higher information asymmetry. Barron et al. (2012) also use analyst coverage to measure information environment characteristics, including the infor-mation asymmetry. Their approach takes into consideration the expected dispersion of analyst fore-cast, as well as squared errors in the mean forecasts based on historical data and the number of analyst following.

The information asymmetry can be treated as idiosyncratic volatility. Therefore, in order to reduce idiosyncratic component of CEC, the level of disclosure can used as influential tool to decrease information asymmetry between managers and investors (Lopes, de Alencar, 2010).

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Accounting information and corporate disclosure policy

The internal factor which is directly connected with information asymmetry represents financial disclosure. Financial disclosure is considered as an important part of corporate governance (Ashbaugh et al., 2004; Byun et al., 2008; Pae, Choi, 2011, Paseková et al., 2018).

The quality of accounting information and its transparency decrease the information and agency risks. There is no doubt to say that disclosure reduce information asymmetry and as a result decrease the cost of capital. The information asymmetry represents the adverse selection into transactions between buyers and sellers, and therefore reduces liquidity in company's shares (Copeland, Galai, 1983; Kyle, 1985). This effect occurs in three ways. Firstly, investors demand a risk premium for bearing information risk. In turn, disclosure reduces it, consequently risk premium decreases and as a result CEC. Secondly, higher disclosure decreases estimation risk and thirdly it enhances stock market liquidity and as a result reduce transaction cost that leads to lower CEC.

Accounting information

Accounting information plays a great role in the decision making process and other firm's activities. Moreover, its quality and quantity might decrease or increase the information asymmetry and as a result have an impact on the cost of capital. Many researches examine the different aspects of accounting information and their influence on the capital costs.

Firstly, Easley and O'Hara (2004) investigate the influence of private and public information on the cost of capital with further development of asset-pricing model, where both types of information affect asset returns. Investors demand higher return to the companies with greater private information and correspondingly less public. Private information causes additional systematic risk and thus an investor requires compensation for that kind of risk. According to their equilibrium a com-pany with information that is more private and less public faces a higher CEC.

Lately Li (2005) finds that low precision of noisy information about the expected aggregate dividend growth rate increases the risk premium and stock return volatility and in turn the precise information decreases the risk premium and as a result the cost of capital.

Apergis et al. (2011) provide theoretical model, which shows that "an increase in expected cash flows, coming from improvements in the quality of accounting information, leads to a reduction in the firm's cost of capital". From the model the authors point out several factors leading to the cost of capital reduction: (1) "the decline of the variance in the idiosyncratic variation in firm's cash flows"; (2) "the decline of the variance in the common variation in firm's cash flows with the mar-ket"; (3) "the increase in the shareholder's base of the economy or alternatively the increase in the number of investors who participate in the market"; (4) "the increase in the risk tolerance of the market"; and (5) the increase in the firm's expected cash flows".

The corporate earnings as a significant element of accounting information are a widespread subject of research. The earnings are the significant part of accounting information, which can be disclosed, in order to reduce the risk of information asymmetry. Consequently, the earnings characteristics are examined as factors influencing the CEC. One of the most indicative attributes of earnings is earnings smoothness. It is generally thought among executives that earning smoothness might lead to lower cost of capital. However, McInnis (2010) finds that there is no relation between earnings smoothness and average stock returns over 30 years period. At the same time there is evidence that inverse association between cost of capital and earnings smoothness is driven by optimism in ana-

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lysts' long-term earnings forecasts. Consequently, companies with volatile earnings do not experience high returns.

Another significant earnings characteristic is their quality level. The researchers determine that low quality of earnings increase information asymmetry, which lead to higher CEC (Aboody et al., 2005; García Lara et al., 2011). For instance, Apergis et al. (2012) empirically investigate the influence of accounting information and the earnings quality on the cost of capital. According to authors higher quality represents higher precession of public disclosure; when lower level of private information minimizes gains obtained by privately informed investors. The quality of earnings is defined by the absolute value of the abnormal component of accruals: the higher absolute value is associated with lower quality. The authors conclude that discretionary accruals as a measure of earnings quality are important proxy for corporate information environment. The abnormal component of accruals reduces the effectiveness of public earnings announcements that in turn increases the risk of information asymmetry.

Further, conservatism represents another attribute of earnings quality from the view were earnings are determined to evaluate economic income. In terms of transparency and information asymmetry the concept of accounting conservatism has been occurred. In 1980 the Financial Accounting Statements Board developed the Statement of Financial accounting Concepts, where conservatism was defined as "a prudent reaction to uncertainty to try to ensure that uncertainties and risks inherent in business situations are adequately considered". Givoly and Hayn (2000) define conservatism as "a selection criterion between accounting principles that leads to the minimization of cumulative reported earnings by slower revenue recognition, faster expense recognition, lower asset valuation, and higher liability valuation". They also determine two measures of conservatism: (1) the sign and magnitude of accumulated accruals over period of time; and (2) the excess of the relation between stock price movements and earnings signals in "bad news" periods of time over such relation in "good news" periods. Watts (2003) points out the alternative explanations of conservatism as contracting, shareholder litigation, taxation and accounting regulation. In general terms, the accounting conservatism can be classified as ex post (also named as conditional or news-dependent) and ex ante (also named as unconditional, news independent). Ex ante conservatism represents "aspect of the accounting process determined at the inception of assets and liabilities yield expected unrecorded goodwill". Ex-post conservatism refers to situation when "book values are written down under sufficiently adverse circumstances but not written up under favourable circumstances, with the latter being the conservative behaviour" (Beaver, Ryan, 2005).

As accounting conservatism incorporate transparency and timeliness of financial reporting, many researchers investigate its influence on the CEC as one of the information characteristics. Chan et al. (2009) find that ex ante conservatism leads to lower CEC. Ex ante and ex post conservatism provide different information about the quality of a firm's current and future earnings to equity investors. Ex ante conservatism leads to lower CEC because it provides more persistent and predictable current and future earnings streams and therefore ensures good quality earnings and accounting information to the market. In addition, companies, with higher level of ex ante accounting conservatism have lower CEC despite the level of leverage, the firm's size, earnings variability. Later Artiach and Clarkson (2010) also find negative relation between ex ante firm-level conservatism and CEC; however, the association becomes weaker with low information asymmetry.

Besides the conditional conservatisms is also significantly negatively related to CEC. Basu (1997) determines conditional conservatism as "more timely recognition in earnings of bad news regarding future cash flows than good news" that can be explained by hire sensitivity of earnings to negative unexpected returns rather that to positive. Later based on the empirical evidence García Lara et al. (2011) argue that conditional conservatism leads to higher information precision, increased company value and lower CEC by the means of decreasing the uncertainty in amount and distribution of the future cash flows and volatility of future stock prices. In another

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words additional conservatism decreases information asymmetry problems, improves investment efficiency and results in stronger corporate governance. The research conducted by Mikhail et al. (2004) shows that companies with repeated surprising quarterly earnings announcement experience higher cost of capital. Moreover, the sign of earning surprise does not influence the outcome. In another words, the market take into consideration the smoothness of earnings to a greater extent rather than the pattern of news (i.e. bad or good news).

Summing up, there is no doubt that high quality accounting information reduces the information asymmetry that in turn alleviates the conflicts between managers and investors and as result lead to lower CEC.

Corporate disclosure policy

As was mentioned before the disclosure level is associated with information asymmetry; in another words higher disclosure represents more transparent and available information. The corporate dis-closure or transparency can be defined as „the widespread availability of firm-specific information concerning publicly listed firms in the economy to those outside the firm" (Bushman et al., 2004).

First of all, disclosure can be divided into two ways: institutional (or mandatory) and voluntary. The first one is required by laws and regulations and widely is used among companies. The voluntary disclosure depends on the company's incentives to inform investors better. The institutional and voluntary disclosure can be complements or substitutes. The country's accounting laws provide a minimum standard for its listed companies, indicated what kind of information has to be disclosed. However the managers have discretion to voluntary provide additional information above requirements.

Bushman et al. (2004) divide corporate transparency into two dimensions: (1) financial transparency and (2) governance transparency. They argue that the financial transparency is related to political regime and governance transparency is associated with legal regime. Under their framework the corporate information mechanism can be classified into three categories: corporate reporting, private information acquisition, and information dissemination. Following Bushman et al. (2004) DeBoskey and Gilett (2013) conduct factor analysis of ten corporate transparency variables used by other researchers and identify four independent dimensions of corporate disclosure: public disclosure information, intermediary information, earnings quality information and insider information. They also investigate the influence of these variables on the CEC and other corporate performance. Their findings show that intermediary information transparency and insider information transparency are significantly associated with CEC. Myskova and Hajek (2016) assess the impact of the information published in annual reports of companies on the market value of shares. They show that net optimism in annual reports is perceived positively by stakeholders.

One of the most difficult challenges in corporate disclosure research is the choice of appropriate proxy for disclosure. The key problems of disclosure measurement are difficulty in the identification of the full population of disclosures and difficulty to consistently classify the form and type of disclosure. As a rule researchers might use two alternative approaches to measure disclosure: own created disclosure indices or ratings produced by external parties. The advantage of the researchers constructed disclosure indices is ability to be applied a widely range of companies, compare to external agency' indices which are limited to companies covered by these external parties. On the other hand, researcher constructed index contains subjective opinion and explanation. The external indices have also several disadvantages. Firstly, they might be a time limitation. Secondly, the external scores represent analysts' understanding of disclosure quality rather than disclosure quality of a company. On the contrary the advantage of this approach is the fact that it is constructed by pri-mary users of the disclosure information, moreover, they are experts in the investigated industry and familiar with a company. In another words there is higher adequacy of external indices in terms of specific companies or industries (Artiach, Clarkson,

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2011). For example, Lopes and de Alencar (2010) develop Brazilian Corporate Disclosure Index, which measure disclosure across several di-mensions: "… (1) general information about the firm; its market, and major events over the last year; (2) relations to employees and managers regarding compensation and policies; (3) non-financial information about markets, sales, and products; (4) information about forecasts of sales, cash flows, and earnings; (5) discussion and analysis of financial data, including tie series information about performance and explanations of past behaviour; and (6) other information". In total there are 47 attributes, which were collected from annual reports, websites and other public sources. Earlier Richardson and Welker (2001) also use disclosure rating as proxy for disclosure, which includes 20 categories from corporate annual reports. Baginski and Rakow (2012) use three dimensions to determine the quality of voluntary disclosure represented by management earnings forecast: (1) whether a company is "a supplier of at least one quarterly management earnings forecast over 16 quarters"; (2) forecast frequency of private information revelation; and (3) the precision of forecast. Table I summarizes implied measures of corporate disclosure in the selected studies on the relation between corporate disclosure and CEC.

In the same way many studies have shown that both mandatory and voluntary disclosure decrease the CEC by the means of information asymmetry reduction. Chen et al. (2010) investigate the influence of mandatory disclosure on the cost of capital at the US market. In 2000 the Securities and Exchange Commission's Regulation Fair Disclosure (RFD) has become effective, which "prohibits selective disclose of material information to a subset of market participants, such as analysts and institutional investors, without simultaneously disclosing the same information to the investing public". The purpose of such mandatory disclosure is to increase investors' confidence and provide equal access to information. The findings show that there is a significant decline in the cost of capital for medium and large companies in the post-RFD period; i.e. mandatory disclosure leads to lower CEC. The latest research also indicates the negative relation between mandatory disclosure and CEC. Based on the international evidence for the period between 1990 and 2004, Core et al. (2015) find that mandatory disclosure quality significantly decreases the CEC. In addition they incorporate into model the inside ownership, which strengthens the direct influence of disclosure.

Table 1. The corporate disclosure measurement

Study	Measure of disclosure	Region
Richardson and Welker, 2001	Financial disclosure rating based on annual reports	Canada
Lopes and de Alencar, 2010	BCDI (Brazilian Corporate Disclosure Index)	Brazil
Kim and Shi, 2011	Managements earnings forecasts (bad/*good news)	USA
Baginski and Rakow, 2012	Management earnings forecast disclosure policy (three dimension measure)	USA
Barth et al. 2013	Transparent earnings	USA
DeBoskey and Gillett, 2013	Multi-dimensional corporate transparency: public disclosure information, intermediary information, earnings quality information, insider information	USA

Source: Authors' composition

Besides, some researches investigate disclosure more specifically. For instance, Barth et al. (2013) analyse the relation between transparent earnings and lower cost of capital; they find that more transparent earnings lead to lower cost of capital. The low transparency might push some investors to private information acquisition. As a rule, such information about company's economic value is costly and investors would cover expenses by the means of higher required premium.

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Summing up, the higher disclosure leads to more liquid markets that in turn reduces risks and decreases the CEC.

Corporate governance and its elements

Corporate governance and its elements is an essential factor influencing the CEC. There is no unique precise definition of corporate governance. According to Claessens and Yortoglu (2013) the conception of corporate governance can be divided into two types. The first type of definition un-covers the behavioural patterns of this term: behaviour of a company in terms of efficiency, perfor-mance, financial structure, growth, treatment of shareholders and stakeholders. From this perspec-tive corporate governance can be define as "the complex set of constrains that determine the quasi-rents (profits) generated by the firm in the course of relationship with stakeholders and shape the ex post bargaining over them". The second type unfolds the normative framework of the term: legal and judicial system, financial and labor markets regulations. On this view the corporate governance can be defined based on the functional approach. The corporate governance can be characterized as the selection of institutions and policies that are involved in the following functions related to com-panies: (1) pooling resources and subdividing sharers; (2) transferring resources across time and space; (3) risk management; (4) generating and providing information; (5) dealing with stimulating problems; and (6) resolving competing claims on the funds generated by the companies. As Ash-baugh et al. (2004) notice "…corporate governance encompasses a broad spectrum of mechanism intended to mitigate agency risk by increasing the monitoring of management's actions, limiting managers' opportunistic behaviour, and improving the quality of firm's information flows".

Many researchers create their own indexes of corporate governance measurement. As a rule, they divided it into several categories (Table II). The most used attributes of the corporate governance are as follows: board structure, ownership structure, shareholder rights, information quality and disclosure, and audit committee independence.
Ashbaugh et al. (2004) find that corporate governance has a significant influence on the CEC. In particular, the companies reporting larger abnormal accruals have a higher cost of equity; at the same time the companies with more transparent earnings and more independent audit committees face lower CEC. The concentrated ownership represented by the number of blockholders also has a positive relation, i.e. blockholders increase the agency problems, thereby rise CEC. Likewise Byun et al. (2008) find that corporate governance reduces the CEC as the result of agency problems and information asymmetry reduction. They argue that shareholder rights protection has the most signif-icant influence on the CEC. At the same time the board of directors and disclosure also reduce CEC.

The quality of corporate governance plays significant role in degree of the effect on the CEC. Ali Shah and Butt (2009) investigate the influence of the quality of corporate governance on the expected CEC. They use the Corporate Governance Score as a measure for the corporate governance quality. The research based on the Pakistan listed non-financial companies shows that board size is nega-tively related to the CEC, i.e. the larger board lead to lower cost of equity. In addition, managerial ownership has negative influence on the cost of equity, i.e. a higher number of shares held by board members leads to the higher CEC. Moreover, the board independence and audit committee inde-pendence have a positive and insignificant influence on the CEC. Thus, the companies with stronger corporate governance face lower CEC. Similarly Zulkufly (2012) indicates the quality of corporate governance based on the six categories as board structure and procedures, board compensation prac-tices, shareholder rights and relations, accountability and audit, transparency and social and envi-ronment (139 items in total). A higher quality of corporate governance leads to lower CEC for Ma-laysian listed companies. However, the significance of separate categories impact varies. The board structure and procedure, shareholder rights and relations, and accountability and audit characteris-tics are significant in explaining the level of CEC. At the same time, the influence of board compensation practices, transparency and ethic and social activities is not significant.

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Later Mazzotta and Veltri (2014) apply more specific corporate governance index to indicate the influence of corporate governance on the CEC for companies listed on the Italian stock exchange. This index includes four dimensions of board characteristics: board independence, board size, exist-ence of internal board committees and independence of board committees. Pae and Choi (2011) investigate the influence of comprehensive corporate governance on a value premium. They find that stronger corporate governance leads to the lower CEC. Moreover, the beneficial effect of corporate governance on the CEC is stronger for companies with weaker commitment to business ethics. In the case of local evidence Tran (2014) analyses the relation between CEC of German listed companies and corporate governance represented by financial information quality, ownership struc-ture and board remuneration.

The findings show that higher financial transparency and bonus compensations lead to lower cost of capital. Moreover, block ownership is negatively associated with CEC, when block holders are other companies, managers or founding-family members.

Table 2. The categories of corporate governance

Authors	Ashbaugh *et al.*, 2004	Byun *et al.*, 2008	Ali Shah and Butt, 2009	Piot and Missioner-Piera, 2009	Pae and Choi, 2011	Zulkufly, 2012	Mazzotta and Veltri, 2014	Tran, 2014	Feng, 2015
Information quality and disclosure	+	+		+		+		+	
Ownership structure	+		+		+			+	
Shareholder rights	+	+		+		+			+
Board characteristics	+	+	+	+		+	+		+
Board independence					+		+		
Board remuneration						+		+	
Audit						+			
Audit committee independence		+	+	+					
Distribution of the proceeds of operation				+					
Dividend policy		+							
Compensation committee (policy)					+				+
Independence of internal committees						+	+		
Ethical and social activities						+			
Vision and strategy									+

Source: Authors' composition

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Social factors as non-financial determinants

Currently, the sociology and psychology have become more integrated into economics as a science. In this context, the social factors represent a new direction in evaluation of the CEC. Researchers start to investigate the influence of social factors on the corporate performance as well as CEC. One of these factors is social disclosure or social responsibility, which closely interconnect with corporate disclosure in general. Richardson and Welker (2001) find that social disclosure positively and significantly influence the costs of equity capital. The social disclosure is a measure that includes 10 categories of information from corporate annual reports: human resources; products; services, and consumers; community; environment; energy resources; governments; suppliers; shareholders; competitors; miscellaneous.

In recent years interest to corporate social responsibility (CSR) has been increased: investors pay attention to social activities of the companies and economists and researchers support companies in social polices improvement. For instance, Ghoul et al. (2011) argue that corporate social responsibility represented by investment in improving responsible employee relations, environmental policies, and product strategies reduce CEC. In global terms the influence of social responsibility on the CEC is investigated by Dhaliwal et al. (2014). Their results show a negative relation between CSR disclosure and the CEC, moreover the association is stronger in stakeholder-oriented countries. In addition there is evidence that financial and CSR disclosures can be substitutes in reducing the CEC.

Later Feng et al. (2015) also analyse the relation between corporate social responsibility and CEC based on the international evidence. They find that CSR is significantly associated with lower CEC in North America and Europe. However in Asian countries the relation is positive. The Commission of the European Union defines CSR as "a concept whereby companies integrate social and envi-ronmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis". The CSR index consists of four dimensions: environment performance, social performance, economic performance and corporate governance performance. The findings show that in North America economic performance (that includes profitability, long-term growth and cost) has more significant impact on the CEC. At the same time in European countries greater environment protection, social performance or performance management will lead to lower CEC. On the other hand in Asia corporate governance, environment and social performance are significantly positively related to CEC, i.e. stronger social responsibility leads to higher CEC.

The social and environment responsibility can be referred to sustainability as a new popular concept. According to Feng et al. (2015) social performance consists of employment quality, health and safety, training and development, diversity, human rights, community, product responsibility. Ng and Rezaee (2015) investigate the relation between CEC and business sustainability, as well as envi-ronmental, social and governance performance. The findings prove that economic sustainability disclosure negatively influences the CEC; moreover, growth and research factors contribute in this relation. In addition, the non-financial dimensions of sustainability as environmental and governance performance reduce CEC. However social sustainability performance is not significantly related to CEC.

Environmental performance as a part of social responsibility might include resource reduction, emission reduction and product innovation (Feng et al., 2015; Tvaronavičienė, 2018). Sharfman and Fernando (2008) ana-lyse the environmental performance and its influence on the CEC. The higher level of environmental risk management make a company more legitimate and increase investors' confidence that in turn leads to lower CEC. The environmental risk management is measured by quantitative measures as Toxic Release Inventory (TRI) data (data about the use, emission and disposal of ca. 600 toxic elements) and qualitative measures (based on the

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Kinder, Lydenberg, Domini & Co, Inc. or KLD social performance score). The findings show that stronger environmental risk management reduced CEC.

In the same way corporate ethic or ethical commitment has become one of the important non-financial factors influencing corporate performance, including CEC. The degree of corporate ethic can be measured by indices. For example, Choi and Jung (2008) combines corporate ethical com-mitment index based on the self-administrated anonymous questionnaires, which includes implicit dimensions of ethical commitment (top management support, corporate culture, ethical leadership, open communication channels and ethical training) and explicit dimensions (codes of ethics, ethics hotlines, ethics officers and ethics committees). Later based on corporate ethical commitment index Choi (2012) investigates the influence of corporate ethics on the CEC and finds significantly nega-tive relation between two variables for companies listed on the Korean stock market.

Extending the comprehension of non-financial performance the marketing and advertisement might influence the corporate financial performance through earnings growth and expected cash flow in-crease. For instance Singh et al. (2005) analyse the influence of product market advertising on the cost of capital, including CEC. The study shows the negative relation between advertising expenses and CEC for U.S. companies. Marketing expenses (among them advertisement) are aimed to create customer loyalty, promote a brand, generate higher margins and increase revenue. Moreover, the advertisement might improve the shareholder value. An increased visibility among customers and investors will lead to a higher liquidity and the spread of the stocks on the market.

Another research on the relation between non-financial performance and the cost of capital is con-ducted by Himme and Fischer (2014). They investigate the influence of customer satisfaction, brand value and corporate performance on the cost of capital, including CEC. The findings show that only higher satisfaction ratings decrease CEC. Customer satisfaction plays a significant information role as it reflects customers' experience in the past and assumes customers' willing to come back or recommend a company that in turn might lead to earnings increase and the higher future cash flows. In another words the customer satisfaction provides information about customers' willingness to pay thus expected earnings. At the same time, authors do not find strong evidence on the relation be-tween brand value and corporate reputation and the CEC.

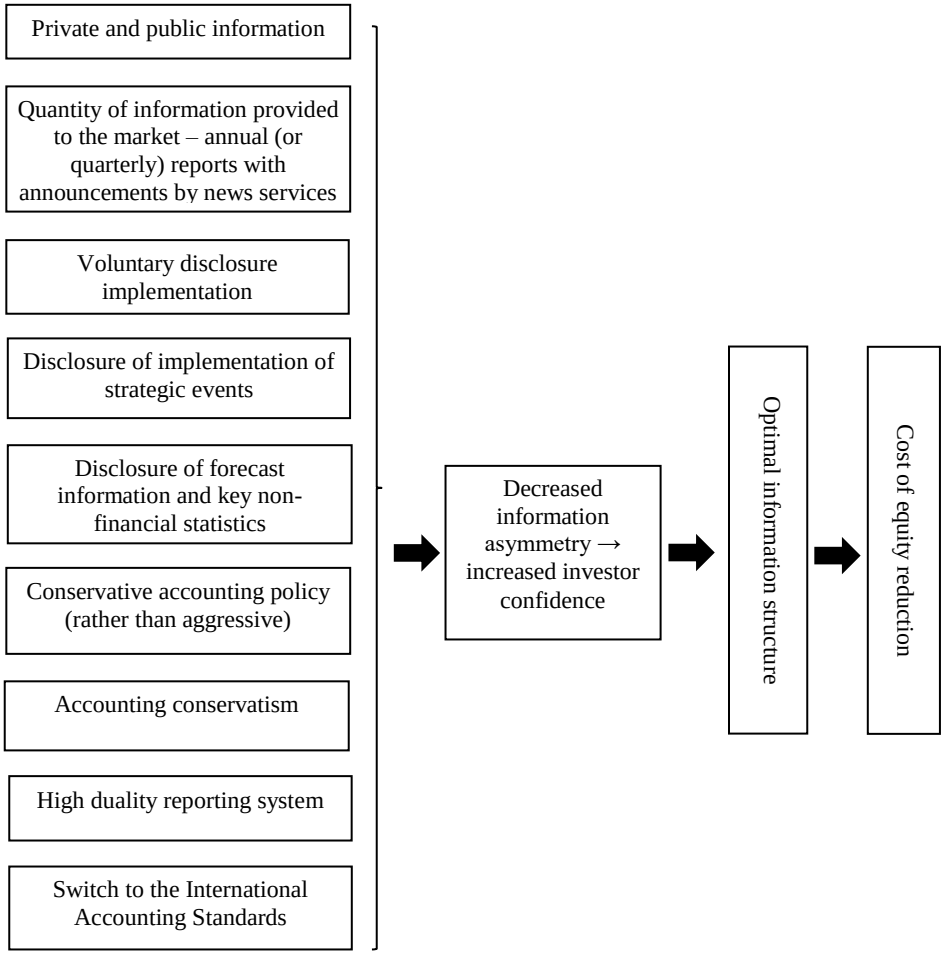
Summing up, the non-financial performance as social factors significantly influences the CEC. Moreover, the improvement of such factors as social disclosure and social responsibility, employee relations, product strategies, environmental performance, environmental risk management will lead to lower CEC.

How to reduce cost of equity capital?

Based on the literature review regarding the internal factors a strategy how to decrease the CEC has been generated. This strategy is focused on internal factors adjustments that in turn lead to lower CEC. In terms of accounting information and corporate disclosure the strategy how to decrease the CEC is shown in Scheme 1.

Summing up, the companies can adjust the CEC by means of influence of the internal factors as the quality and quantity of accounting information, the accounting systems and standards, the type of disclosure. The information environment influences the companies' decision-making process and has a direct influence on the CEC and its management by the estimation risk and information asymmetry reduction. However, there are continuous debates between proponents and opponents of greater discloser, because it is difficult to quantify and establish the benefits of discloser.

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Scheme 1. How to reduce the cost of equity in terms of accounting a disclosure?

Source: Authors' composition

The strong corporate governance and its attributes reduce the CEC by decreasing the agency problems and information asymmetry. The conducted analysis of previous studies contributes towards the following set of recommendations, which companies may adopt in their financial strategies. Firstly, board independence should be improved, i.e. the number of independent directors should be increased. Next measures concern board size adjustment, establishing of independent audit commit-tee and its sizing (4 – 5 members on average), auditors' compensation adjustment, increasing of investors' protection and shareholder rights improvement.

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Strong corporate governance provides effective financial decisions connecting with the cost of capital and solves information asymmetry problems reducing moral hazard at the same time. Those problems can be arisen because of low quality of management and imperfection of information on the market about the real company's value. In addition, strong corporate governance includes positive abnormal returns, higher firms value, higher profits, higher sales growth, fewer corporate ac-quisitions and lower capital expenditures.

The non-financial performance as social factors also influences the CEC significantly. The improvements of these factors should be focused on higher social disclosure, stronger social responsibility, improvements in responsible employee relations, improvements in product strategies, stronger social performance as employment quality, health and safety, training and development, diversity, human rights, community and product responsibility. Attention should be also payed to stronger social commitment as top management support, corporate culture, ethical leadership, open commu-nication channels as well as to the existence of codes of ethics, stronger environmental performance, higher marketing expenses and higher customer satisfaction.

All these improvements of internal factors might support companies to reduce the CEC.

Conclusions

In this paper we compiled and accumulated knowledge on the relation between internal factors and the cost of equity.

The internal factors can be divided into three main categories: disclosure policy, corporate governance and social factors. All these internal factors might reduce the CEC. The most important factor that links together internal factors and CEC is information asymmetry. Researchers agree on that lower information asymmetry leads to lower CEC. The disclosure policy and its elements reduce the CEC. Likewise the stronger corporate governance by itself and its components lead to lower CEC. The frontier in the CEC research concerns social factors. The studies show that stronger social responsibility and corporate ethics decrease the CEC. Moreover, the improvements in environmental performance can be used to adjust the level of equity capital costs. The complex knowledge regarding the CEC reduction might support the decision-making process in terms of capital management and represents a tool of more efficient management in terms of financing.

We believe that our systematic review facilitates the understanding of the consistent patterns inside the company and interrelations between essential corporate elements and provides a solid theoretical background for further research in terms of the CEC.

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MODELS FOR THE INTERACTION BETWEEN SPACE SERVICES PROVIDERS AND MANUFACTURERS OF SPACE VEHICLES

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Abstract. The authors have formed the space market structure which is distinguished by the junctional formation of the summed demand for a product or service between the participants at the same stage, which serves as a basis for the formation of demand at the next stages. The peculiarities of participants' interaction on the space services market are associated with incomplete awareness. It is advisable to use the methodological approach considered in the theory of contracts in the case of asymmetric information to develop models of interaction between market participants. Thus, based on the theory of contracts and taking into account the specifics of interaction in this article the authors have described the models for the generation of an optimal contract for the manufacturer of space vehicles and space services providers. The models are presented for the cases with symmetric and asymmetric information. As a result of solution of the task for the generation of an optimal contract, such parameters of the contract as satellite performance, the price of its information throughput unit, as well as the cumulative indicator of its technical and operational characteristics can be found in the course of interaction between these participants of the space market. The determined parameters of the contract allow maximizing the profit of the manufacturer of space vehicles.

Keywords: decision model; contract theory; world space market; generation of an optimal contract; information symmetry; information asymmetry

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JEL Classifications: C70, L11, L14

1. Introduction

The volume of the world space market has increased almost 3 times for the last decade (Bocindzer 2017). A progressively large income share falls on commercial sector of the space market, in particular, on the space services segment. New market branches emerge which can open new opportunities for the economies of different

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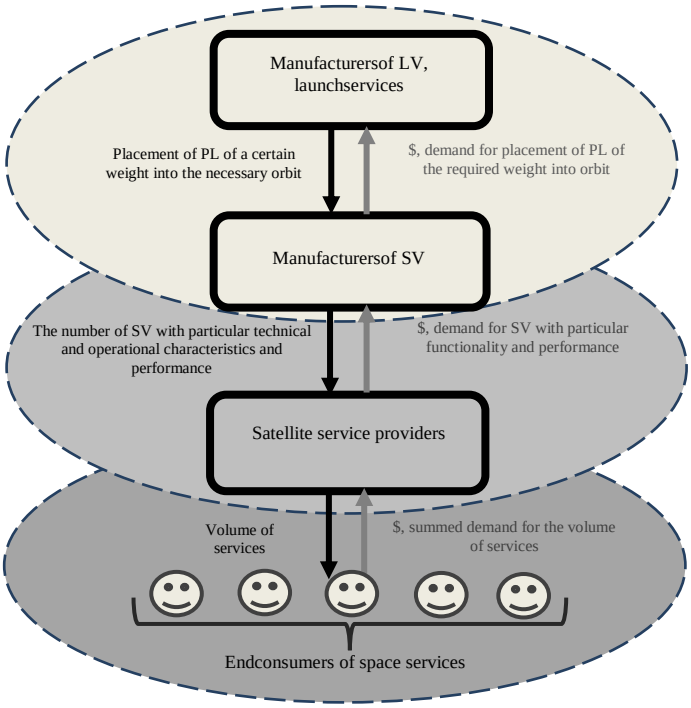
countries. In addition, space services and goods become more affordable to the consumers, the growing competition between the participants of the space market forces them to develop new technological solutions to improve the quality of goods and services, as well as reduction in their value. The obvious trend of commercialization of the space market leads to the need of formulation of the models of interaction between the economic operators in each segment of this market. The space market is very specific; one of its features is the closed nature of information about its participants and the interaction between them in the context of an individual contractual relationship. This is precisely why the development of the models of interaction between the participants of the space market is expedient based on the contract theory.

The segmentation principle of the world space market is based on the data which was published in the reports of Satellite Industry Association (e.g. SIA, 2017). The models for the generation of an optimal contract between the manufacturer of space vehicles and the space services providers are based on the models of adverse selection of the two types of operators in the context of the contract theory (Borch 1962; Balbás et al. 2013, 2014; Bossaerts et al. 2010; Ardalan et al. 2017)

A model for the case of availability of asymmetric information involves finding the optimal contract by imposing the incentive restrictions, described in the works (Nash 1950; Kurz, Hart 1982). Utility functions for the satellite service providers are selected in such a way that Spence-Mirrlees condition (strict single crossing condition) was met for them (Araujo, Moreira 2010).

2. Main part

Space industry market can be classified into the following segments in terms of goods and services: manufacturing of space vehicles, manufacturing and operation of ground equipment, provision of launch services and manufacturing of launch vehicles, as well as provision of satellite services. Contractual relationship emerge both inside of each segment of the space market and between the segments.
Figure 1 presents the space market structure.



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Fig 1. Space market structure.
(PL – payload, LV – launch vehicle, SV – space vehicle)
Source: https://www.roscosmos.ru/media/files/docs/2017/SpAsBus/1_bocindzer.euroconsult.-.roscosmos.1.ru.pdf

On a large scale, the interaction between the participants of the space market analyzed through the prism of generation of economic contracts between pairs "customer-performer", can be depicted in the form of three stages. The first stage describes the interaction between the satellite service providers and the end consumers. It is at this stage where a demand for a particular volume of services is formed, which subsequently imposes the areas of work to the following market stages. When an economic contract is generated at this stage, the satellite service provider provides a certain volume of services of a particular type to the end consumers, setting a price which depends on several factors (costs, market situation, consumer type, etc.). This range of satellite services, formed based on the demand of the end consumers, becomes the basis for the determination of the number of space vehicles required for satisfying the summed demand of the end consumers of space services and their technical and operational characteristics at the next stage. The second stage describes the interaction between the satellite service providers and the manufacturers of space vehicles: while some make an order for the performance of a specific technical task, the others offer to perform it for a certain price. Space vehicles of a certain weight, which are required to be placed into orbit, will be developed during the placement into orbit at the second stage. Thus, the need to place the required payload into a particular orbit by means of launch vehicles arises at the third stage, which is met through the conclusion of a commercial contract for the development of a launch vehicle and its launch.

Thus, the above scheme is representative of the entire process of functioning of the space market: from the starting point – the summed demand of the population for space services – to the final point - the launch and maintenance of an on-orbit space vehicle. In 2017, the volume of commercial sector of the world space market amounted to 250 billion USD (Figure 2) (Bocindzer 2017).

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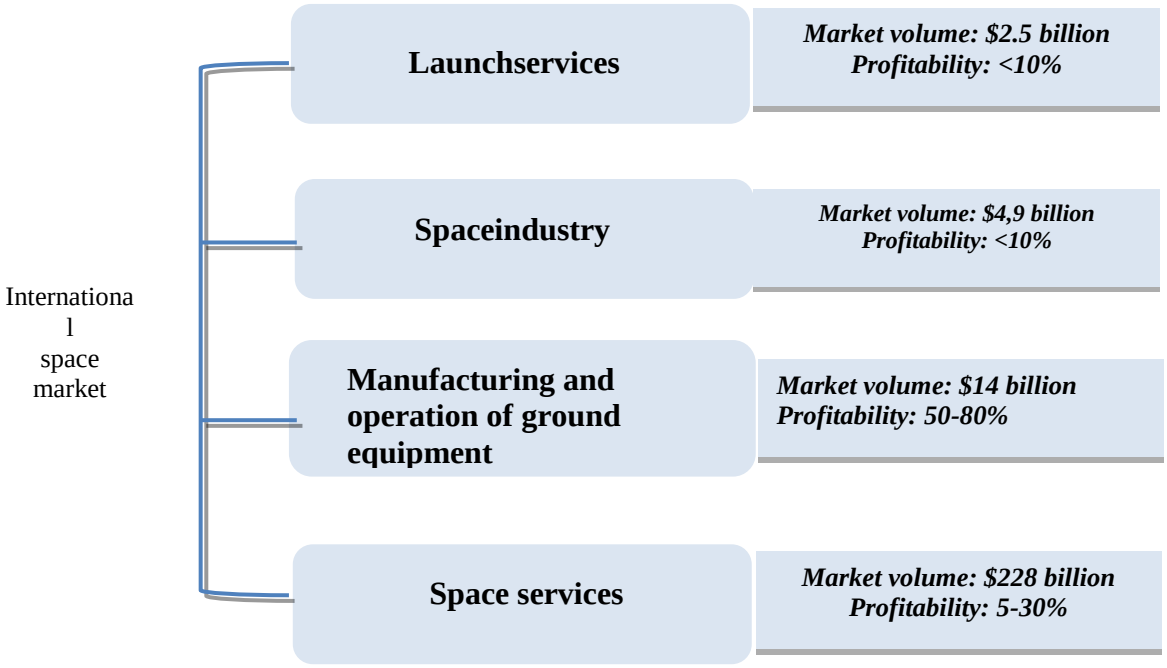


Fig 2. Volumes of the segments of the international space market in 2017

Source: https://www.roscosmos.ru/media/files/docs/2017/SpAsBus/1_bocindzer.euroconsult.-.roscosmos.1.ru.pd

The space services segment is the most significant: its income in 2017 amounted to 91% of the total income of the world space market. The number of participants of this segment of the space market is the largest at the moment:

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there are about 5000 companies in it. The cost effectiveness according to EBITDA (Earnings before interest, taxes, depreciation and amortization) in this segment reaches 30%. About 50 companies are engaged in the sector of manufacturing and operation of ground equipment, about 30 companies are engaged in space industry sector, and about 10 companies are engaged in the launch services sector (Bocindzer 2017).

Thus, at each stage of the chain of formation of contractual relationship between the participants of the space market, the subject of the contract can be various parameters of a good or service which the customer (consumer) intends to receive. For example, at the stages of interaction between a company engaged in manufacturing of space vehicles and a space services provider the subject of the contract can be a particular number of space vehicles with functionality required by the provider. In order to generate the contract, the manufacturer of space vehicles faces the task of maximizing its profits through the identification of the value of satellite for the buyer (type of the buyer), apart from the task of formation of base cost of a project of development of space vehicle, because in this case there is an opportunity to increase the price for those types of buyers who are willing to pay more for the satellite. Thus, there arises a task of simulation of interaction of economic operators of the space market both in the context of symmetric information, when the type of the buyer is known to the manufacturer of satellites, and asymmetric information, when such information is not available to the buyer. In order to formulate such a model, one of the options may include the application of a vehicle of the contract theory, which allows to take into account the possible availability of information asymmetry in the market and to introduce a mechanism for identification of the types of space services providers in the model.

Let's consider a block diagram of interaction of participants of one of stages of the chain of formation of contractual relationship: the companies engaged in manufacturing of space vehicles and space services providers. In this case, pursuant to the terminology from the contract theory, the manufacturer of space vehicles is a principal, and the buyers of its products are operators, since the information about providers which is available to them is not available to the manufacturer: the manufacturers of space vehicles have no clear vision of the true value of satellites for the providers, or, in other words, of the maximum amount that a provider is willing to pay for a space vehicle to be purchased. We'll define this parameter as θ, which will denote the type of the customer that, for example, in the context of the participants of the space market under consideration, can depend on the kind of further use of the satellite: commercial or non-commercial. Let's consider the simplified situation when two providers - θ_1 and θ_2 - refer to the manufacturer of space vehicles. The higher the ratio, the higher is the type of provider, which means it is willing to spend the greater amount on the purchase of the satellite. When ordering a satellite, the provider is interested in x_i - it is the satellite performance (the amount of information required for the provider of *i*-type to satisfy the demand of the consumers of the space market or for own needs), as well as η_i – a cumulative indicator of technical and operational characteristics generated by the manufacturer of space vehicles based on the requirements of the provider of *i*-type (Boonen 2016). The manufacturer of satellites, having received the information about the necessary characteristics, calculates the estimated costs for such a project and then offers the contract to the customer (p_i, x_i, η_i), where p_i is the cost of the conditional information throughput unit for the provider of *i*-type. The usefulness of the first customer is described by function $u_1(x_1,\eta_1,T_1)=\theta_1 v_1(x_1,\eta_1)-T_1$, where $v_1(x_1, \eta_1)$ is the estimated monetary value of the satellite buyer with a performance of x_1 and a cumulative indicator of technical and operational characteristics η_1, $v_1(x_1)=a_1x_1^2+b_1x_1+m_1\eta_1^2+n_1\eta_1$; T1is the costs of the first customer for the total information throughput to be purchased, where $T_1=p_1(1+\eta_1)x_1$.

The usefulness of the first customer is described by function $u_2(x_2,\eta_2,T_2)=\theta_2 v_2(x_2,\eta_2)-T_2$, where $v_2(x_2, \eta_2)$ is the estimated monetary value of the satellite purchase provider with a performance of x_2 and a cumulative indicator of technical and operational characteristics η_2, $v_2(x_2)=a_2x_2^2+b_2x_2+m_2\eta_2^2+n_2\eta_2$; T_2 is the costs of the

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second customer for the total information throughput to be purchased, where $T_2 = p_2(1+\eta_2)x_2$. The costs of the manufacturer of space vehicles for the information throughput unit amount to *c*.

Let's simulate two cases: in the first case, we will refer to symmetric information, when the type of the satellite buyer is known to the manufacturer of space vehicles, and, based on this information, he takes a decision on what satellite performance and its cumulative indicator of technical and operational characteristics it can offer based on the customer's requests, and how much the information throughput unit of such satellite will cost. Asymmetric information is considered in the second case, when the manufacturer of space vehicles is not able to differentiate the satellite buyers and thus is dorced to employ a principle of identification of the type of provider in order to determine the optimal menu of contracts in the form of $(x_1{*}, p_1{*}, \eta_1{*})$ and $(x_2{*}, p_2{*}, \eta_2{*})$ for each type of it.

Both satellite service providers solve the task of maximizing their own usefulness for themselves: $\theta_i v_i(x_i,\eta_i) - T_i \to \max\limits_{x_i,\eta_i}, i = 1,2$ (Aase 2009). When substituting expressions of the estimated monetary value of the satellite, purchase provider and its costs for the purchase of a space vehicle, we obtain the following target function of the first provider: $\theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1)x_1 \to \max\limits_{x_1,\eta_1}$. In order to find the cumulative indicator of technical and operational characteristics of the satellite and its performance, the provider of the first type must solve the system of equations - first-order conditions by x_1 and η_1 (Osborne, Rubinstein 1964) (1)-(12):

$$\begin{cases} \dfrac{\partial u_1}{\partial x_1} = 2\theta_1 a_1 x_1 + \theta_1 b_1 - p_1(1+\eta_1) = 0 \\ \dfrac{\partial u_1}{\partial \eta_1} = 2\theta_1 m_1 \eta_1 + \theta_1 n_1 - p_1 x_1 = 0 \end{cases} \quad (1)$$

Let's express η_1 from the second equation:

$$\eta_1 = \frac{p_1 x_1 - \theta_1 n_1}{2\theta_1 m_1} \quad (2)$$

Further, we insert the expressed η_1 into the first equation of the system (1) and determine the optimal performance indicator of the satellite $x_1{*}$ for the provider of the first type:

$$x_1{*} = \frac{\theta_1(2m_1p_1 - 2\theta_1 b_1 m_1 - p_1 n_1)}{4\theta_1^2 a_1 m_1 - p_1^2} \quad (3)$$

Now the determined optimal satellite performance (3) is inserted into expression (2), and the optimal cumulative indicator of technical and operational characteristics of the satellite is determined:

$$\eta_1{*} = \frac{p_1\theta_1(2m_1p_1 - 2\theta_1 b_1 m_1 - p_1 n_1) - \theta_1 n_1(4\theta_1^2 a_1 m_1 - p_1^2)}{2\theta_1 m_1(4\theta_1^2 a_1 m_1 - p_1^2)} \quad (4)$$

A set of equations drawn up for the provider of the second type after differentiation of its target function, is solved in a similar way $\theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - p_2(1+\eta_2)x_2 \to \max\limits_{x_2,\eta_2}$:

$$\begin{cases} \dfrac{\partial u_2}{\partial x_2} = 2\theta_2 a_2 x_2 + \theta_2 b_2 - p_2(1+\eta_2) = 0 \\ \dfrac{\partial u_2}{\partial \eta_2} = 2\theta_2 m_2 \eta_2 + \theta_2 n_2 - p x_2 = 0 \end{cases} \quad (5)$$

Let's express η_2 from the second equation of the system (5):

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$$\eta_2 = \frac{p_2 x_2 - \theta_2 n_2}{2\theta_2 m_2} \quad (6)$$

Further, expression (6) is inserted into the first equation of the system (5) and the optimal performance indicator of the satellite x_2* is determined for the provider of the second type:

$$x_2 * = \frac{\theta_2(2m_2 p_2 - 2\theta_2 b_2 m_2 - p_2 n_2)}{4\theta_2{}^2 a_2 m_2 - p_2{}^2} \quad (7)$$

In order to determine the cumulative indicator of technical and operational characteristics of the satellite for the provider of the second type, equation (7) is inserted into (6) and expressed as η_2*:

$$\eta_2 * = \frac{p_2\theta_2(2m_2 p_2 - 2\theta_2 b_2 m_2 - p_2 n_2) - \theta_2 n_2(4\theta_2{}^2 a_2 m_2 - p_2{}^2)}{2\theta_2 m_2(4\theta_2{}^2 a_2 m_2 - p_2{}^2)} \quad (8)$$

The providers' demand for the satellites D_i is described by equations where xcmaxis the maximum satellite performance, for each individual customer:

$$D_1 = \begin{cases} \frac{\theta_1(2m_1 p_1 - 2\theta_1 b_1 m_1 - p_1 n_1)}{(4\theta_1{}^2 a_1 m_1 - p_1{}^2) x_c{}^{\max}}, 0 \le p_1 \le \theta_1 \\ 0,\ p_1 > \theta_1 \end{cases} \quad (9)$$

$$D_2 = \begin{cases} \frac{\theta_2(2m_2 p_2 - 2\theta_2 b_2 m_2 - p_2 n_2)}{(4\theta_2{}^2 a_2 m_2 - p_2{}^2) x_c{}^{\max}}, 0 \le p_2 \le \theta_2 \\ 0,\ p_2 > \theta_2 \end{cases} \quad (10)$$

The task of the manufacturer of space vehicles consists in maximization of its profit Π_i from the order of provider of each type: $\Pi_i = (p_i - c(1+\eta_i)) \cdot D_i(p_i) \to \max_{p_i}$

Demand expressions (9) and (10) respectively should be inserted into the target function of the manufacturer of space vehicles for each type of provider, after which it should be differentiated according to the price. Thus, the task of the manufacturer of space vehicles for the provider of the first type will be as follows:

$$\Pi_1 = (p_1 - c(1+\eta_1)) \cdot \frac{\theta_1(2m_1 p_1 - 2\theta_1 b_1 m_1 - p_1 n_1)}{(4\theta_1{}^2 a_1 m_1 - p_1{}^2) x_c{}^{\max}} \to \max_{p_1} \quad (11)$$

For the provider of the second type:

$$\Pi_2 = (p_2 - c(1+\eta_2)) \cdot \frac{\theta_2(2m_2 p_2 - 2\theta_2 b_2 m_2 - p_2 n_2)}{(4\theta_2{}^2 a_2 m_2 - p_2{}^2) x_c{}^{\max}} \to \max_{p_2} \quad (12)$$

The obtained equation has no analytical solution during differentiation. In this case, the known numerical methods can be used for determination of extremum of functions (Balbás, A., Balbás, B., Balbás, R.). As a result, the optimal costs of the conditional information throughput unit will be obtained for the providers of the first type and the second type p_1* and p_2* respectively.

Thus, the task which was considered in the above statement has the following stages of solution for the case k of providers:

1. A task for each provider of i-type is generated:

$$u_i = \theta_i v_i(x_i, \eta_i) - T_i \to \max_{x_i, \eta_i}, i = \overline{1,k}$$

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2. A system of equations is solved - first-order conditions by x_i and η_i. $\begin{cases} \frac{\partial u_i}{\partial x_i} = 0 \\ \frac{\partial u_i}{\partial \eta_i} = 0 \end{cases}, i = \overline{1,k}$

   As a result of solution of the system of equations, the optimal cumulative indicators of technical and operational characteristics of satellite η_i* and its performance indicator x_i* are determined.
3. A demand for satellites of each provider of i-type is formed:

   $$D_i = \begin{cases} \frac{x_i}{x_c^{\max}}, 0 \le p_i \le \theta_i \\ 0, p_i > \theta_i \end{cases}, i = \overline{1,k}$$

   .
4. With due consideration of determined optimal values x_i* and η_i* the target function of the manufacturer of space vehicles is registered: $\Pi_i = (p_i - c(1+\eta_i)) \cdot D_i(p_i) \to \max_{p_i}, i = \overline{1,k}$. The optimal value of price p_i* is determined on the basis of extremum condition, namely the maximum target function of the manufacturer of space vehicles: $\frac{\partial \Pi_i}{\partial p_i} = 0$. The expressions obtained determine the values of an individual cost of the conditional information throughput unit p_i* for each provider of *i*-type.

Thus, the presented algorithm for solving the task of determining the optimal parameters of the contracts between the providers and the manufacturer of space vehicles makes it possible to generate an individual contract (x_i^*, p_i^*, η_i^*) for each provider of i-type, taking into account the value of the satellite to be purchased.

If the information is asymmetric, the manufacturer of space vehicles can not determine the value of the satellite for a particular provider. As a result, the problem of adverse selection arises, when providers can hide their individual value of a space vehicle or adjust it in such a way as to obtain the satellites on more favorable terms with a higher performance. In such a situation, the task of the manufacturer of space vehicles will be to draw up such contract that would guarantee the inexpedience of selection of conditions designed for another type of provider (Asimit et al. 2017).

Thus, similar to symmetric information, the manufacturer of space vehicles offers the contracts of the following form: (x_1^*, p_1^*, η_1^*) and (x_2^*, p_2^*, η_2^*) to the customers. The concept of the contract with filtration of providers in the context of the contract theory involves the use of a principle of identification of their types. This principle consists in imposing the system of restrictions which forces the provider of a higher type to choose its own menu of contracts (Quiggin, Chambers 2009).

Thus, the task of the manufacturer of space vehicles will be as follows (13)-(16):

$$\Pi = \pi(p_1(1+\eta_1)x_1 - c(1+\eta_1)x_1) + (1-\pi)(p_2(1+\eta_2) - c(1+\eta_2)x_2) \to \max_{p_1, p_2, x_1, x_2, \eta_1, \eta_2}$$

$$\begin{cases} \theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1) \ge 0 & (13) \\ \theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - p_2(1+\eta_2) \ge 0 & (14) \\ \theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1) \ge \theta_1(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - p_2(1+\eta_2) & (15) \\ \theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - p_2(1+\eta_2) \ge \theta_2(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1) & (16) \end{cases}$$

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Inequalities (13)-(14) are participation restriction conditions. Inequality (13) determines the inexpedience of withdraw from a bargain for the first provider, and (14) – for the second provider. Conditions (15)-(16) – incentive compatibility restrictions – guarantee that both type of providers will choose the contracts offered by the manufacturer of space vehicles exactly for their type: the usefulness of own contract is higher than the usefulness of someone else's contract (Zhou et al. 2015).

Since the estimated monetary value of the satellite purchase provider of the first type is equal to or larger than zero $a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1 \geq 0$ and the provider of the second type is ready to purchase the satellite for a higher price than the provider of the first type ($\theta_2 > \theta_1$), then

$$\theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - p_2(1+\eta_2) \geq \theta_2(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1) \geq$$

$\theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) - p_1(1+\eta_1)$. If the participation restriction condition (13) is met as an equality, than the cost of the conditional information throughput unit can be increased in such a way that participation restrictions will be met at the same time, and the manufacturer of space vehicles will fatten its profits. Thus, condition (13) is met as an equality in the optimum. Similarly, incentive compatibility condition (15) turns into equality. Thus, since conditions (13) and (16) of the condition are effective, other conditions can be neglected (Aase, 2009) (17)-(18):

$$\Pi = \pi(p_1(1+\eta_1)x_1 - c(1+\eta_1)x_1) + (1-\pi)(p_2(1+\eta_2) - c(1+\eta_2)x_2) \to \max_{p_1,p_2,x_1,x_2,\eta_1,\eta_2}$$

$$\begin{cases} \theta_1(a_1x_1^2 + b_1x_1 + n_1\eta_1^2 + m_1\eta_1) - p_1(1+\eta_1) \geq 0 & (17) \\ \theta_2(a_2x_2^2 + b_2x_2 + n_2\eta_2^2 + m_2\eta_2) - p_2(1+\eta_2) \geq \theta_2(a_1x_1^2 + b_1x_1 + n_1\eta_1^2 + m_1\eta_1) - p_1(1+\eta_1) & (18) \end{cases}$$

Based on conditions (17)-(18), we shall express the costs of the information throughput unit of a space vehicle for both types of the satellite buyers:

$$p_1^* = \frac{\theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1)}{(1+\eta_1)x_1} \quad (19)$$

$$p_2^* = \frac{\theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - \theta_2(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1) + \frac{\theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1)}{(1+\eta_1)x_1}}{(1+\eta_2)x_2} \quad (20)$$

Further, the found expressions for the optimum price for a standard configuration of the satellite (19)-(20) are inserted into the target function of the manufacturer of space vehicles:

$$\Pi = \pi\left(\frac{\theta_1(a_1x_1^2 + b_1x_1 + n_1\eta_1^2 + m_1\eta_1)}{(1+\eta_1)x_1} - c(1+\eta_1)x_1\right) + (1-\pi)\left(\frac{\theta_2(a_2x_2^2 + b_2x_2 + m_2\eta_2^2 + n_2\eta_2) - \theta_2(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1)}{(1+\eta_2)x_2} + \right.$$

$$\left. \frac{\frac{\theta_1(a_1x_1^2 + b_1x_1 + m_1\eta_1^2 + n_1\eta_1)}{(1+\eta_1)x_1}}{(1+\eta_2)x_2}\right) - c(1+\eta_2)x_2) \to \max_{p_1,p_2,x_1,x_2,\eta_1,\eta_2}$$

Then a system of equations is solved - first-order conditions by x_1^*, x_2^*, η_1^*, η_2^*:

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$$\begin{cases} \frac{\partial \Pi}{\partial x_1} = 0 \\ \frac{\partial \Pi}{\partial x_2} = 0 \\ \frac{\partial \Pi}{\partial \eta_1} = 0 \\ \frac{\partial \Pi}{\partial \eta_2} = 0 \end{cases}$$

This system of equations excludes analytical solution. Similar to symmetric information, the known numerical methods of solution can be used. As a result of solution, the optimal performance indicator of the satellite x_1* and x_2* as well as the cumulative indicator of its technical and operational characteristics η_1* and η_2* will be obtained for both types of providers in the context of asymmetric information.

Thus, the task of finding the optimal contracts for the two providers in the context of information asymmetry, considered in the above statement, has the following stages of solution for the case *k* of providers:

1. The task of the manufacturer of space vehicles is formed, which consists in selection of menu of contracts $(x_i^*, p_i^*, \eta_i^*), \mathrm{i} = \overline{1,k}$, which maximizes its profit function:
   $\Pi = \sum_{i=1}^{k} \pi_i (\mathrm{T}_i - c(1+\eta_i)x_i)$
2. The restrictions of individual rationality for all i providers and incentive compatibility restrictions for all *i*, *j* providers are set:
   $\theta_i v_i(x_i, \eta_i) - T_i \geq 0$
   $\theta_i v_i(x_i, \eta_i) - T_i \geq \theta_i v_j(x_j, \eta_j) - T_j$
   The restrictions of individual rationality guarantee participation of providers in the contract process, while the incentive compatibility restrictions guarantee refusal of the provider of type *i* from pretending to be the provider of type *j*.

If there is a strict single crossing condition (Spence-Mirrlees condition), the solution consists in setting the restriction of individual rationality as an equality for the lowest type of provider in the same manner as the incentive compatibility restriction for pairs *i* and *i*-1 (Araujo, Moreira 2010). As a result, all providers, except the provider of the highest type, will receive less satellites than in the public optimum, and only the high-type provider will receive the effective number of satellites with such technical and operational characteristics which are the most relevant for it. If the strict single crossing condition is not met, the solution of the task will be very complicated due to the need of search through a great number of cases.

Conclusions

Thus, the authors have developed a scheme of the space market structure. This scheme implies that the determined parameters of the contract between the participants of the same stage in the course of formulation of interaction models can be used at the next stage, transforming into new parameters. For one of the described stages at which the generation of contract between the space services provider and the manufacturer of space vehicles is considered, a task of finding the optimal contract parameters in the context of symmetric and asymmetric information was simulated. The found parameters allow maximizing the profit of the manufacturer

of space vehicles through identification of the type of providers that want to purchase the satellites. As a result, a contract will be offered to each type of space services provider, including the individual price of the information throughput unit of the satellite, performance, as well as its cumulative indicator of technical and operational characteristics.

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SPECIFICS OF STRATEGIC MANAGERIAL DECISIONS-MAKING IN RUSSIAN OIL COMPANIES

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Abstract. The article considers methodological tools for developing and adopting strategic management decisions at oil and gas companies. For this purpose, the authors set and successively solved the following tasks: the most significant features of management decisions were classified regarding the operation of large vertically integrated oil companies (VIOC); the study presents a model of the full cycle of strategic management at industrial enterprises; the authors propose an original algorithm for the development of strategic decisions at VIOC and review the existing general theoretical tools used for selecting strategic alternatives regarding their applicability at various levels of the company's management hierarchy; a mechanism for devising and taking strategic decisions has been developed on the example of the oil production department; the authors determined the significance of strategic managerial decisions that are currently transforming from traditionally functional into the corporate ones. The revealed positive dynamics in the costs of research and development (R&D), the increase in the number of applications for patents, and the findings of a survey conducted among top management of oil and gas companies have proven the importance of innovation and taking accurate managerial decisions on its implementation. In addition to this, the paper provides evidence that all oil and gas companies are currently using modeling as a key tool when making managerial decisions.

Keywords: management, strategy, managerial decisions, oil companies, innovation

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JEL Classifications: L21, L71, D7, M19, O32

1. Introduction

At present moment, the level of the economic development of a country still depends on the development level of the fuel and energy industry and oil companies. According to A. Novak, despite the sanctions and drop in prices for the main energy resources, in 2016 all fuel and energy industries worked steadily and improved their performance. The total inflow of investments into the fuel and energy sector amounted to 3.7 trillion rubles, with a growth of about 6%. In general the energy industry was developing at a faster pace than Russian economy. For the first time in many years the country put some new fields into production (RusCable.Ru. Energy Utilities. Electrical Engineering. Communication, 2017).

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To date, the fuel and energy industry is one of the most stably operating production industries of Russian economy. It accounts for about 30% of Russia's GDP, 50% of the country's tax revenues, and 30% of its exports (Plenkina & Osinovskaya, 2017).

Considering the scale of their operation and a wide range of production processes that vary from geological prospecting to processing and marketing, the effective performance of oil companies directly depends on the quality of the company management and the management decisions taken, particularity strategic ones. The stable operation at present and the progressive development in the future can be achieved only by taking timely and accurate strategic managerial decisions that should be devised and selected using the approaches that ensure high scientific validity of decisions (Lenkova et al., 2011; Kleyner et al., 1997). This can be achieved both via deep theoretical elaboration of options and by studying Russian and international experience and its practical application.

The relevance of the research stems from the fact that there have been no comprehensive or systematic methodological papers that familiarize managers at different levels with the tools that can be used to justify the choice of a strategic managerial decision. At the same time, they should comply with the specifics of the operation of large oil and gas producing companies.

2. Materials and methods

2.1. Main characteristics of strategic decisions

Having analyzed the fragmented theoretical and methodological aspects of strategic management (David, 2015; Johnson et al., 2008; Mintzberg, 1994; Bowman, 1997; Vikhansky, 2006; Zub, 2002; Moiseeva & Kostina, 2010; Rumyantsev, 2012; Ansoff, 1999), we could create a model for making managerial decisions (Fig. 1).

The main characteristics of strategic decisions have been considered in detail in the works of Russian and international authors (Hickson et al., 1986; Belyaeva et al., 2014; Vorobiev et al., 2003; Lafta, 2002; Eddous & Stensfield, 1997; Saati, 1993; Zub, 2002). Regarding the specifics of the operation of large vertically integrated oil companies, these papers allowed us to identify that strategic decisions at the company level:
1) represent the opinion of the top management in which direction each business segment should be developed and at what speed innovation and ambitious plans should be implemented;
2) should facilitate the company's interaction with the external environment both within the country and outside it;
3) take into account the potential of the company, the resources available and promote the business activities;
4) develop the overall vision of the necessary changes in the system of company's work activities;
5) are extremely complex as they are to represent the interests of virtually all company's production segments in the whole value chain in a highly risky and uncertain environment;
6) require an integrated approach to the company's management;
7) have a sufficiently long lead time during which long-term goals and objectives are developed;
8) should comply with the expectations of key members within the company;
9) have an influence on the resources and operation of the company;
10) influence the company's reserves and initiate a variety of organizational solutions at a lower level;
11) require in-depth knowledge of industry trends, laws and patterns that are characteristic of both Russian energy market and the global one. The outcome, as a rule, depends more on the quality of the decision than on the speed or timeliness of its adoption, and has no rigid time limit;
12) are subjective and cannot, as a rule, be objectively and thoroughly evaluated.
Therefore, making the full cycle of managerial decisions in oil companies, the managers of all departments should take into account the industry specifics of their development (Plenkina, 2017; Ermilov & Milovidov, 1998; Trakhtengerts et al., 2005; Omelicheva & Pranovich, 2002; Osinovskaya, 2015).

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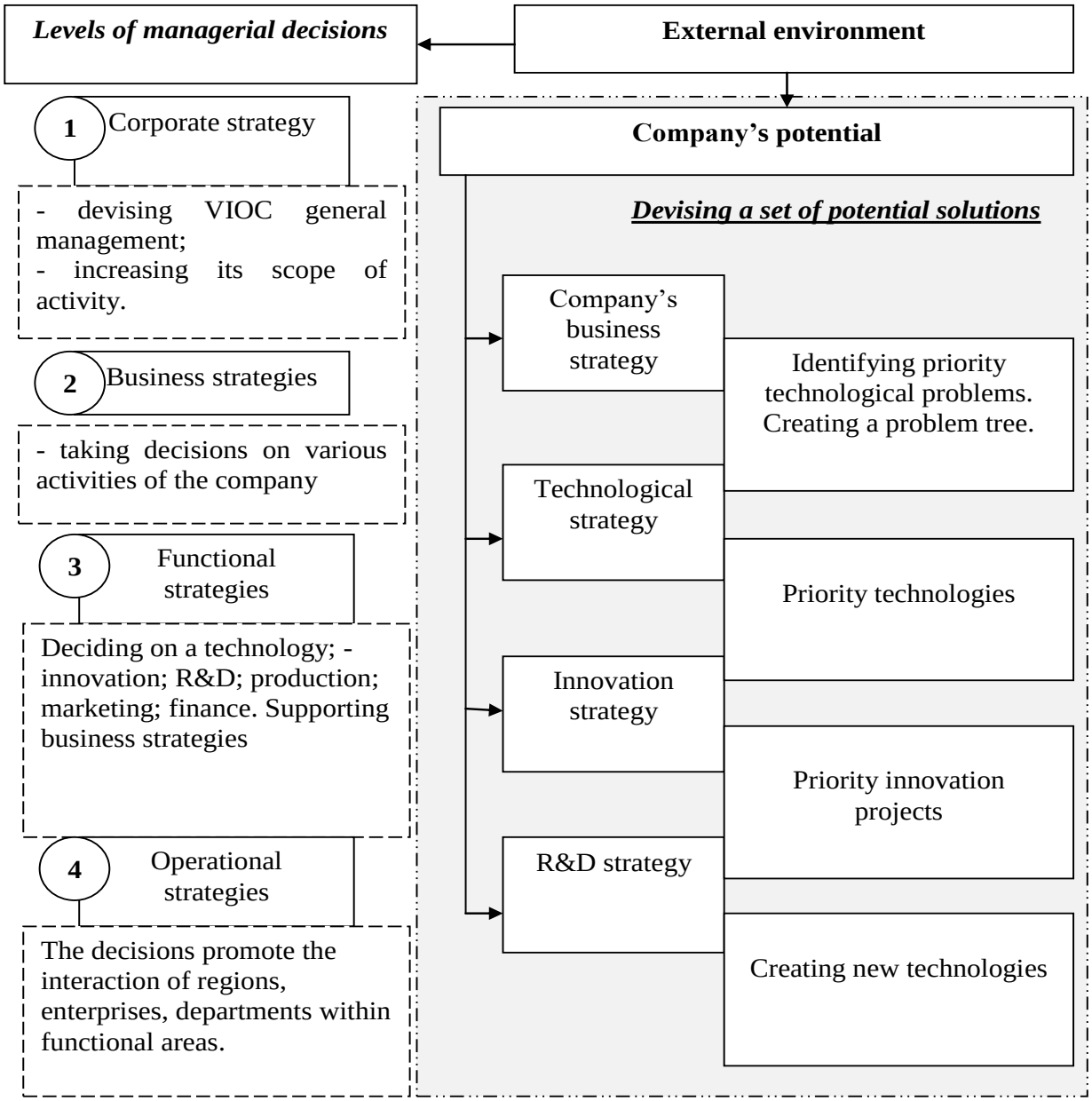


Fig. 1. Strategic management of oil companies and making managerial decisions

Source: compiled by the authors basing on the following works: David, 2015; Johnson et al., 2008; Mintzberg, 1994; Bowman, 1997; Vikhansky, 2006; Zub, 2002; Moiseeva & Kostina, 2010; Rumyantsev, 2012; Ansoff, 1999

2.2. Algorithm for identifying priority strategic managerial decisions in oil companies

Having systematized certain theoretical aspects of strategic decision-making, we could present a generalized sequence of procedures that might be used to devise a development strategy in a vertically integrated oil and gas company (VIOC) (Fig. 2). As can be seen from the algorithm for making strategic decisions presented in Fig. 2, the goals and direction of the company development depend on its type.

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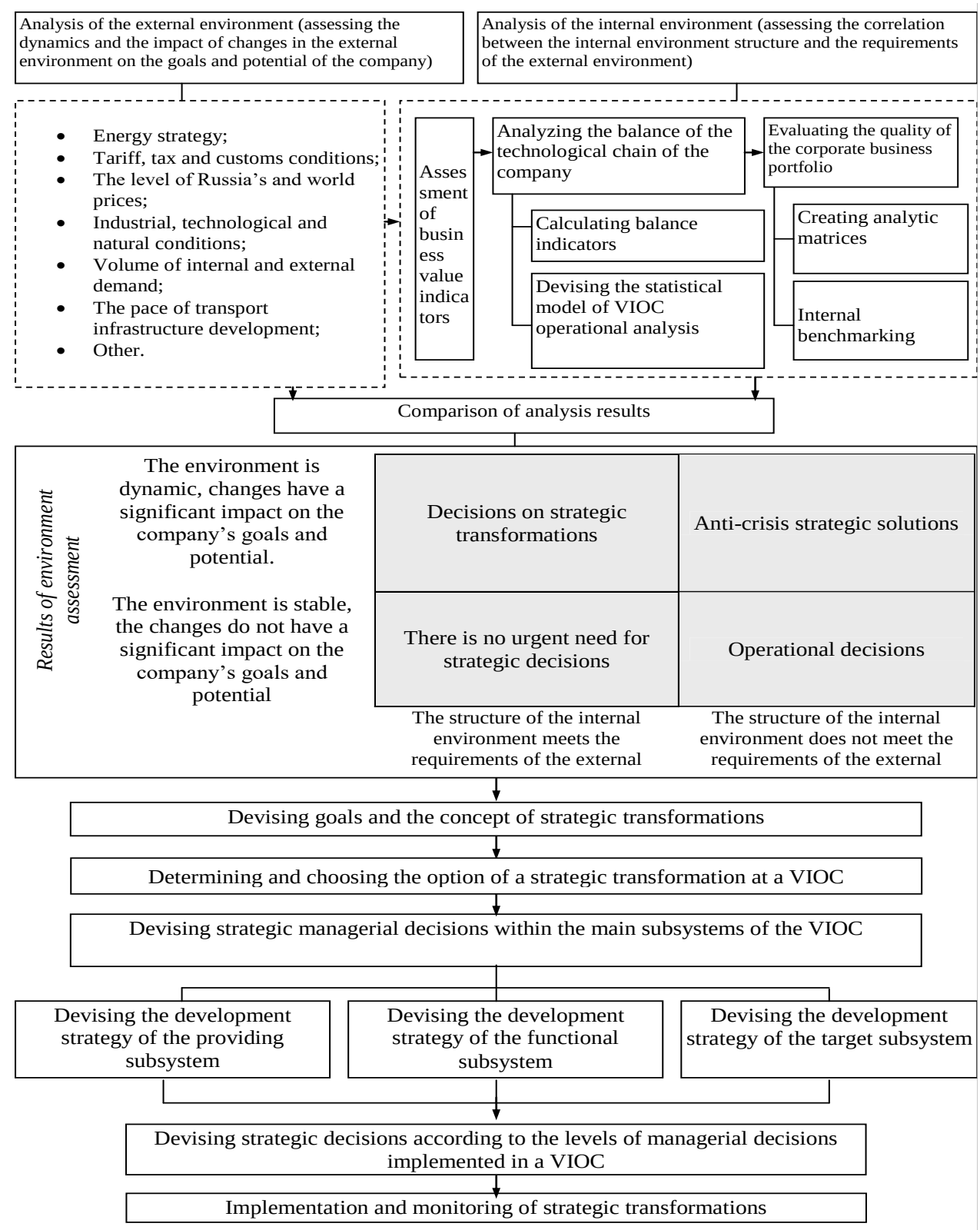


Fig. 2. The sequence of procedures for developing strategic decisions in the VIOC

Source: compiled by the authors basing on the following works: Plenkina, 2017; Ermilov & Milovidov, 1998; Trakhtengerts et al., 2005; Omelicheva & Pranovich, 2002; Osinovskaya, 2015

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In this case, one should actively apply tools of strategic, anti-crisis and production management that are adapted to the operating conditions of a particular subject researched. Combination of certain ideas obtained from the data on the application of management approaches makes it possible to develop a theoretical and methodological tool for carrying out strategic transformations at any enterprise. For instance, it seems possible and viable to develop a general algorithm for making strategic decisions at an enterprise, which is achieved through systematization of fragmented theoretical propositions.

At the same time, since there is no universally accepted algorithm, it is necessary to justify the selection and adaptation of existing methodological approaches to the specifics of the work of business entities in the industry. In the algorithm presented in the figure, when considering the internal environment of an oil company, three components are indentified during the implementation of analytical procedures: assessing how balanced the operation of the VIOC is, portfolio analysis of business entities and calculation of business value indicators.

At the same time, some experts believe that the analysis should be carried out as thoroughly as possible so that one can comprehensively assess the current situation. Others, on the contrary, claim that it is sufficient to conduct an express analysis to save the time and money spent on diagnosing and developing decisions for the further development of the business that is initially unviable. Following the author's reasoning, it is recommended to consolidate existing opinions and carry out rapid analysis consistently to provide the overall description of the enterprise's situation and a detailed analysis of the emerging conditions in which the company operates as this will allow identifying opportunities for resolving conflict situations and successful business development.

At the same time, when analyzing the environment, it is often necessary to transform the theoretical and methodological propositions that allow adapting existing provisions to the operating conditions of a certain economic entity. Thus, it is necessary to formulate comprehensive resultant criteria for the company's activities, developed on the assessment of its financial situation, the potential of the enterprise, its position in the market, management and control. In addition, it is necessary to methodologically devise a set of indicators which would allow determining the type of company, and, consequently, the goals and main directions of further strategic transformation by integrating the results of the analysis of the external and internal environment.

Further scientific research within the outlined problem can involve specifying and adapting the theory of managerial decisions-making regarding the specifics of the operation of economic entities in a particular industry, and especially regarding the specifics of oil and gas enterprises' functioning. At the same time, the essence of development and selection of managerial decisions depends more on their nature: operational or strategic ones.

At the same time, the oil company is a complex structure, and its strategy acts as the basis for the development of strategies of its separate subsystems. Devising strategies for the operation of each of these subsystems is a fairly complicated procedure, the implementation of which requires considering a number of specific factors.

2.3. Methodological tools for selecting priority areas for oil companies' development

The most frequently used methods, models, schemes, and approaches applied for determining a strategy, and, consequently, strategic decision making, can be summarized according to the stages of strategic analysis (Table 1). In this case, the applicability of particular methods at the level of business units (enterprises that are part of joint-stock companies) is fairly hypothetical and is possible only after a significant transformation of traditional approaches.

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Table 1. Methods of strategic decision making in the VIOC

Stage	Method, approach, technology	Level of managerial decisions adoption		
		Enterprises as part of joint-stock companies	Joint-stock companies, business group, production units as part of an oil company	Oil company (holding company)
1	2	3	4	5
Analysis of the mission and objectives - identifying mission and objectives	- analysis of the goal setting, the company's goals and strategies for achieving them;		+	+
	- a business system model;	++	+	+
	- a "goal tree";	+	++	+++
	- a development scenario;	+	++	+++
	- analysis of time series, extrapolation of trends;	+	+	+
	- simulation models;	+	+	+
	- methods of expert assessments, Delphi method, brainstorming.	+	++	+++
Analysis of the internal environment - assessing the strategic potential	- product life cycle;		+	++
	- technology life cycle;		++	+++
	- the life cycle of the company;		+	+++
	- comparative analysis of "goals – plan – current situation – optimization – deviation";	+	+	+
	- SBC – identification of strategic business centers of business units (Analytic hierarchy process can be applied);		++	+++
	- SWOT-analysis;	+	++	+++
	- analysis of the value chain (analysis and comparison of costs of the company and its competitors throughout the chain – from the purchase of raw materials up to the prices paid for the goods by end users);	+	+	+
	- functions analysis (marketing, finance, production, staff, corporate culture);	+	++	+++
	- analysis of the competence level;		+	++
	- analysis of the staff loyalty;		+	++
	- compliance of power and responsibility;	+	++	+++
	- sociometry;	+	++	+++
	- workflow analysis;	+	++	+++
	- analysis of incentive schemes;		++	+++
	- studying corporate culture;		++	+++
	- analysis of the organizational structure;		+	++
	- analysis of the information structure.		++	+++
Analysis of the external environment - assessment of the strategic climate	- the industry life cycle;		++	+++
	- Ansoff's "force field" analysis;		++	+++
	- STEP-analysis (analysis of the macro-environment: social, technical, economic, political);		++	+++
	- reviews, information messages, reports, systematic monitoring, analysis and statistical evaluation, scenarios development;		++	+++
	- the concept of driving forces;			+++
	- Porter's five competitive forces;		+	++
	- a map of strategic groups – displaying competitive positions of rival companies in the industry;		+	++
	- Key Success Factors (KSF);		+	++

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	- building a values chain regarding other companies;		+	++
	- position analysis.		++	+++
Analysis of the environment as a whole - evaluating the strategic position; - evaluating the competitive advantage of a diversified company	- Ansoff's matrix "product/market";			++
	- comparison of growth rates and market share – the BCG matrix;		++	+++
	- comparison of market attractiveness and competitiveness – the GE-McKinsey model;			+++
	- comparison of industry attractiveness – Shell-DPM model;			+++
	- analysis of market evolution – the Hofer-Schendel model;			+++
	- analysis of the life cycle of the industry – competitive advantages – the ADL-LC model;			+++
	- "BCG outsourcing matrix";		+	++
	- Universal Process BCG Model	++	+	

Let us give an example, presenting an algorithm for choosing the area of strategic development of a joint-stock company working in the field of the oil and gas extraction and being part of a large VIOC (Fig. 3). However, due to numerous specific factors that determine the functioning of the enterprise, the complexity of making operational managerial decisions is often almost comparable to the complexity of strategic management. Here, the critical factors are the structure of assets and various vertical and horizontal financial and material relationships within the complex integrated structure (an oil company).

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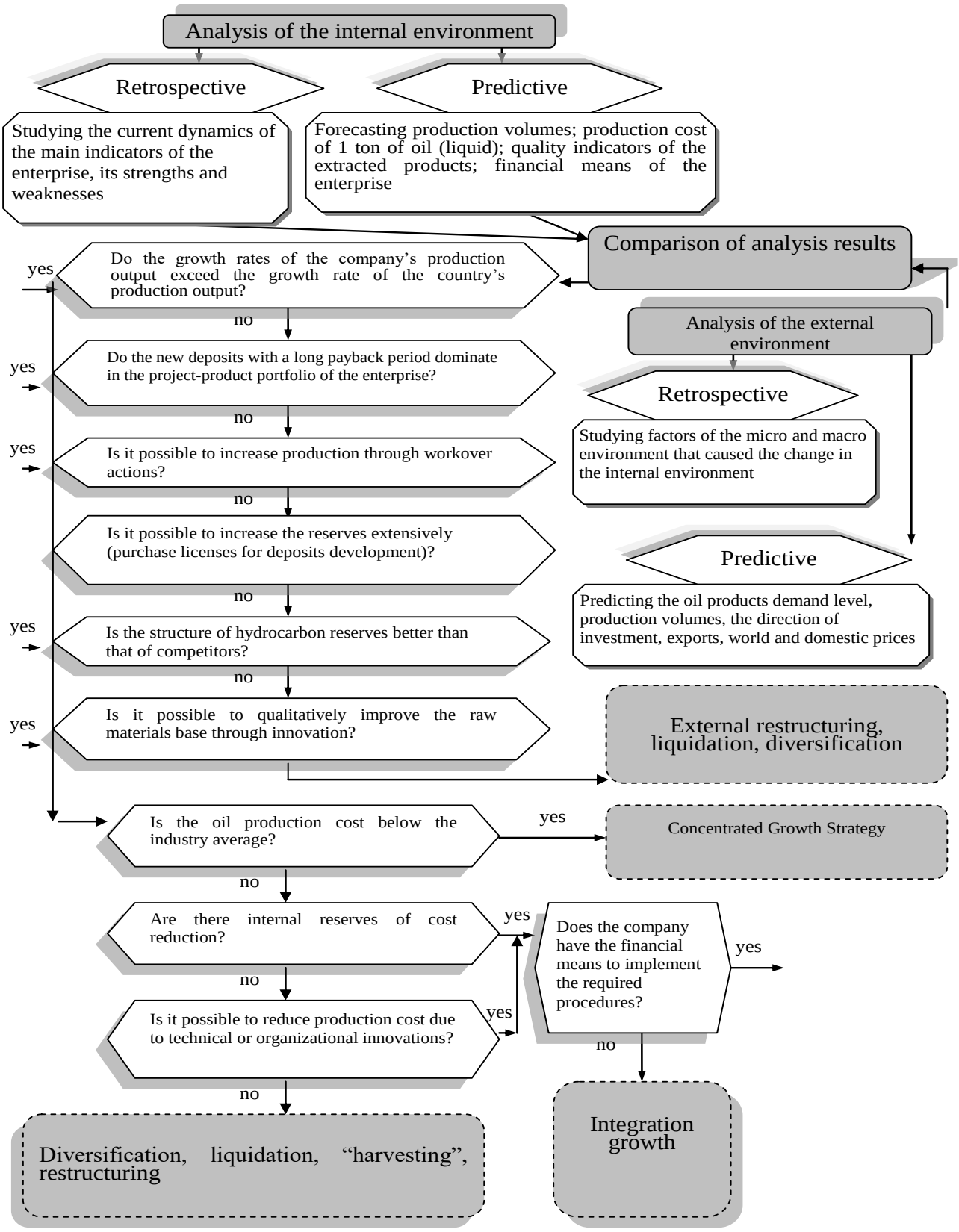
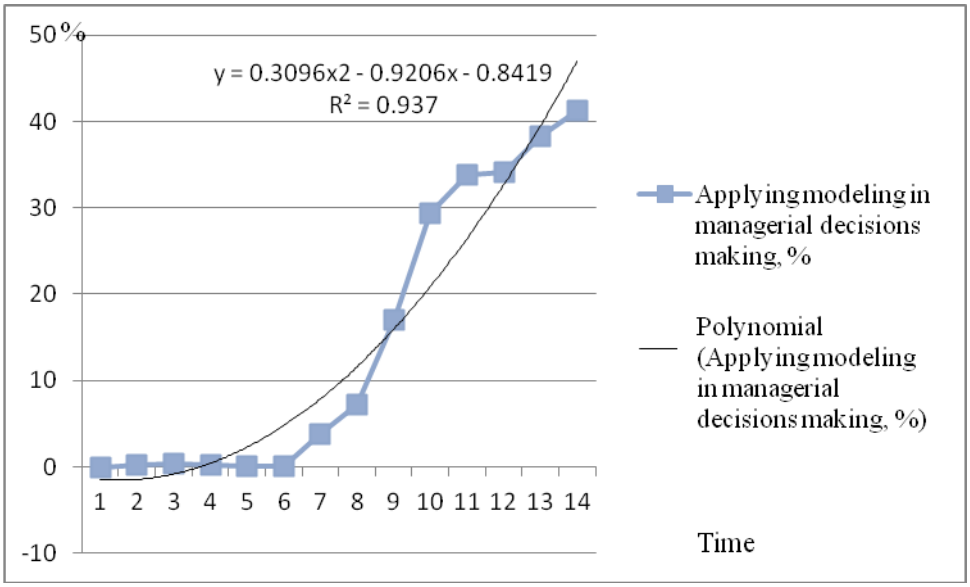


Fig. 3. Mechanism of development and adoption of strategic decisions on the example of oil and gas production companies (a model structure)

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Discussions held among researchers and business representatives on the approaches to substantiating strategic managerial decisions mainly boil down to the conclusion that it is necessary to model the development of the company in the long-term period in one way or another, by considering multivariate parameters that account for the instability and uncertainty of the external environment.

The findings of studying the dynamics of using modeling when making managerial decisions made it possible to identify the relevant trend (Fig. 4) which was used as a basis for predicting further demand for modeling in strategic planning.



Symbols on the timescale:
1 - 1972
14 - 2007

Fig. 4. Application of modeling in managerial decisions making, %

Source: Domestic Management by Numbers. Review of statistical projects of the Ministry of Economic Development and Trade of the Russian Federation, 2007. Adapted by the authors.

Tables 2 and 3 present the study findings on the use of modeling when making managerial decisions, as well as the application of information model tools in making managerial decisions by international and Russian companies (Belyaeva et al., 2014).

Table 2. Application of modeling in making managerial decisions

Year	Application of modeling in making managerial decisions (as percentage of the total volume of decisions taken)
1972	0.01
1975	0.2
1981	0.35
1986	0.2
1989	0.1
1990	0.1
1991	3.8
1994	7.2
1996	17.1
1997	29.3
2000	33.8
2003	34.1

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2006	38.3
2007	41.2
2008	55.0
2009	63.5
2010	72.8
2011	54.9
2012	93.2
2013	100
Note: The forecast data are given in italics.	

Source: Belyaeva et al., 2014

Table 3. Use of modeling tools in making managerial decisions by international and Russian companies

Company	Use of modeling tools in making managerial decisions (as percentage of the total volume of decisions taken)
LG Electronics	69
Microsoft	69
Boeing	65
Latsis Group	63
Lukoil	57
Soyuzplodoimport	54
Alrosa	49
SIBUR Holding	45
RIA Novosti	32

Source: Russian Focus, 2006

Data in Table 2 allow us to conclude that the trend of increasing use of modeling to substantiate managerial decisions that developed over the retrospective period is fully proven at present moment. Considering the dependency presented in Table 2, we can claim that from 2013 this tool was used in 100% cases when making such decisions. This is especially true for large oil and gas producing companies where dozens of parameters of the external environment should be modeled and considered altogether to substantiate strategic decisions and set a strategic reference point in the long-term perspective.

2.4. Strategic benchmarks of oil companies – innovative development in the long term

Over recent years, Russian oil and gas sector has not paid sufficient attention to the innovative processes in the global oil and gas industry. According to the Ministry of Industry and Trade of the Russian Federation, the dependence of Russian oil companies on Western equipment, considering hidden imports (when services are provided by Russian subsidiaries of foreign companies), the share of imported equipment and technologies in the industry reaches the total of 80%. For certain categories, such as equipment for offshore projects or software, the figure can exceed 90% (RBC Daily, 2014). Thus, the deficit of domestic technologies and equipment in the oil industry has reached critical level. At the same time, technology borrowing has economic and political limits. In the context of globalization, science and technological innovation are becoming one of the main factors of world politics. Under these conditions, oil and gas companies should make managerial decisions that shift their strategic focus towards long-term innovative development.

According to Rosstat, over the period of 2011-2013 the total cost of technological innovation for oil and gas producing companies grew from RUB 64.5 billion up to RUB 82.3 billion (ANP. The National Agency of Petroleum, Natural Gas and Biofuels, 2017).

Rosneft demonstrated the highest growth of R&D costs: from RUB 8.6 billion in 2011 to RUB 23.2 billion in 2013. Regarding R&D spending, in 2013 Rosneft was ahead BP and Statoil, increasing the share of R&D costs in revenues up to 0.49%. Over the past 6 years Chinese company PetroChina has been the world leader

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in R&D investment, over last decade increasing its spending on research and development by 6.5 times from USD 355 million in 2004 up to USD 2.3 billion in 2013 year (Silkin, 2014).

The effectiveness of managerial decisions regarding investments in R&D can be analyzed using the indicator of patent activity of Russian oil and gas companies. Having analyzed the data presented in the table below, we can conclude that Russian companies are way below international competitors (Table 4) (ANP. The National Agency of Petroleum, Natural Gas and Biofuels, 2017).

Table 4. Patent applications of the world's largest oil and gas companies in 2013

Companies	Number of patents
International oil companies	
ExxonMobil	292
Total	250
Shell	220
Chevron	163
National oil companies	
PetroChina	1847 (22)*
Saudi Aramco	57
Petrobras	46
Statoil	28
Russian oil companies**	
Gazprom	219
Rosneft	52
Surgutneftegas	16

* - The total number of patent applications of PetroChina in 2013 amounted to 1847 in China and 22 – abroad.

* - Number of patent applications in Russia.

Source: companies reports, WIPO

It is worth mentioning a paper that presents the results of the interviews with the heads of oil and gas companies operating at all levels of the value chain, including both small companies and very large market participants working in exploration and production (including oilfield services), as well as in the refining and marketing segment (Hurley & Hunter, 2014). Approximately 4/5 of the respondents representing the oil and gas industry noted the importance of making strategic decisions aimed at introducing innovations in their business (Fig. 5). For 39% of the top executives of the oil and gas companies interviewed, innovations have already become a critical condition for maintaining competitiveness.

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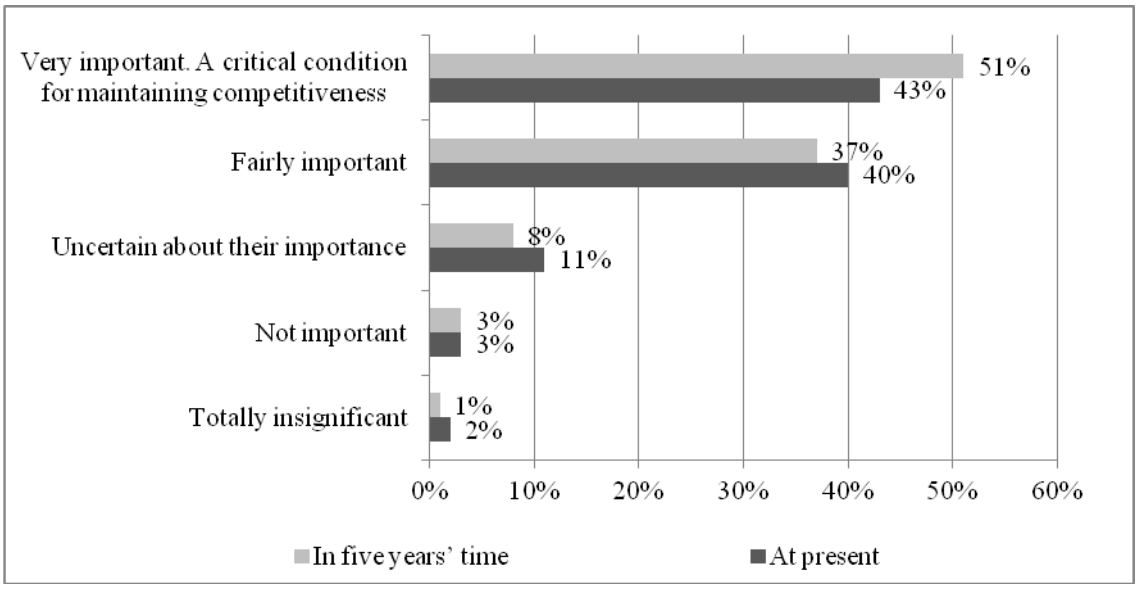


Fig. 5. Expert opinion of oil and gas companies top management on the importance of innovation and managerial decisions on its implementation

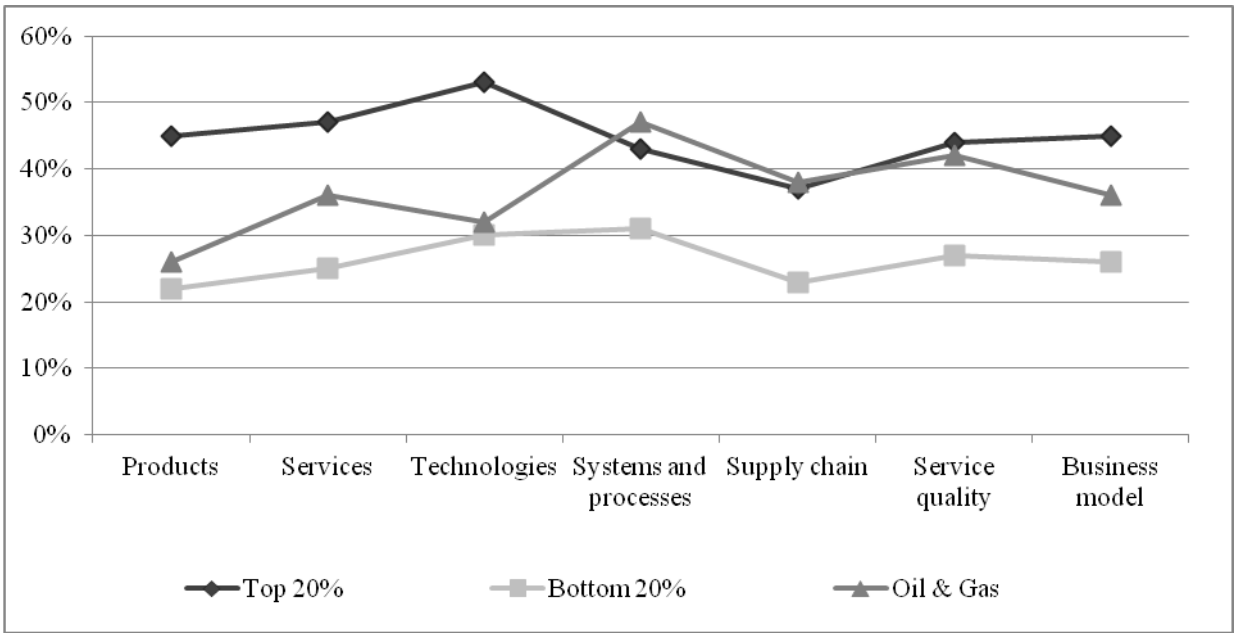
Source: PwC, Growth through Innovation. Russian and International Experience, https://www.pwc.ru/en/innovationsurvey/assets/innovation-through-growth.pdf

If we consider this issue for a five-year lead time, this figure is about to increase up to 48%, and this gives reason to believe that strategic managerial decisions that facilitate the innovation policy are important for each segment of the oil and gas industry. However, only about half of the respondents from the same oil and gas companies noted that their companies had a clearly formulated innovation strategy implemented in their practical activities. This is a serious problem for the companies with no clear concept of innovative development, since the practical solution of the problems of development and growth begins with the creation of a sound and detailed strategy.

This study shows that the constant focus of companies on the issues related to ensuring the balance of the innovative portfolio through timely, accurate and effective managerial decisions is one of the key growth drivers. We define balance as the optimal combination of investments when developing step-by-step, breakthrough and radical solutions in all innovative areas. For oil and gas companies, the optimal combination of investments will depend on the position they occupy in the value chain.

The top managers of oil and gas companies already expect that 32-47% of innovations in their companies will result in major improvements in all the areas considered (Fig. 6). Innovative products are an exception that is mainly relevant for companies working in processing and marketing.

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Note:
Question: how significant do you expect your company's innovative projects to be in the following areas over the next three years?

Fig. 6. Areas of efforts focus of oil and gas companies on radical and breakthrough innovative projects

Source: PwC, Growth through Innovation. Russian and International Experience, https://www.pwc.ru/en/innovationsurvey/assets/innovation-through-growth.pdf

Due to such a high percentage of breakthrough and radical innovative projects, the structure of the innovation portfolio differs significantly from the structure of traditional portfolios with only 10-20% of such projects in the total volume. This shift towards increasing the share of breakthrough and radical innovative projects is an important sign that all sectors of the economy are already transforming through the implementation of strategic decisions aimed at increasing innovation.

3. Results

In the course of the research, we adapted the theoretical aspects of making strategic managerial decisions to the specifics of large oil companies' operation. We focused on the systematization of methods, approaches and technologies used when devising strategic decisions at each stage of the full cycle of decision-making. Recommendations were given regarding the appropriateness of applying a certain set of methods for different levels of managerial decisions. Their practical application by companies will improve the quality of general management and strategic decisions made through more detailed study of alternative solutions and better analysis of the external and internal environment of the company. This is especially relevant for oil companies expanding the field of their activities and operating on the international energy market. Under conditions of high uncertainty and rapid changes in the external environment, companies are forced to consider a large number of alternatives and analyze the distant future, which would allow them to make current managerial decisions that will strengthen their positions in the future. In all countries, the issues of innovation are becoming increasingly important and, consequently, strategic focus of the companies needs adjustment. Using various tools that allow both quantifying the priority options and comparing the results with the opinion of industry experts and top management of large companies, it is possible to outline a scientifically substantiated trajectory of oil companies development as far as introducing innovations and setting them as strategic benchmarks.

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4. Discussion

The relevance of the topic under consideration is determined by the scope and range of the research that various Russian and international authors have conducted in the field of making managerial decisions, which can be found in publications of various levels.

Strategic management was considered through the prism of making managerial decisions in the work of A. Rowe and his team; D. Schendel, K. Hatten and others define strategic management as a decision-making process that combines internal organizational potential with threats and opportunities provided by external environment (Rowe, 2011; Schendel & Hatten, 1972).

In their works, A. Thompson and A. Strickland, J. Pierce II and R. Robinson identify strategic management with one of the areas in the theory of decision-making that is aimed at the development of an effective strategy (or strategies), which facilitates achieving corporate goals (Thompson-Jr. & Strickland, 2006; Pierce II & Robinson, 2013).

General questions of the theory of making managerial decisions have been considered in a number of works (Belyaeva, 2014; Vorobiev et al., 2003; Glushchenko & Glushchenko, 2000; Dik, 2000; Lafta, 2002; Eddous & Stensfield, 1997). Theoretical specifics of strategic decisions are also discussed by some researchers (Rumyantsev, 2012; Moiseeva & Kostina, 2010; Lenkova et al., 2011; Medvedev, 2014).

Researchers have also explored the specifics of the development and adoption of managerial decisions at the level of oil companies (Osinovskaya, 2015; Plenkina, 2017; Omelicheva & Pranovich, 2002; Trakhtengerts et al., 2005; Ermilov & Milovidov, 1998).

We would like to highlight the research of T. Saati which shows the possibility of making strategic decisions on the basis of the hierarchical synthesis of the problem being solved applying the Analytic hierarchy process (Saati, 1993).

Conclusions

One can see the shift in the strategic focus of oil companies towards innovation occurring primarily during the implementation of large projects if one considers managerial decisions made by top management of such companies, and which was analyzed in detail in research papers.

For example, Rosneft has made a decision to invest USD 400 billion in the program of Arctic offshore fields development until 2034. It should be noted that this took place in the conditions of unstable external environment and political threats (which can be seen quite fairly in the SWOT analysis) which call into question the possibility of cooperation with Seadrill and ExxonMobil.

Strategic managerial decisions of Gazprom are also fairly ambitious. For example, the company plans to continue exploration and development of deposits on the Yamal Peninsula, on the continental shelf, in Eastern Siberia and in the Far East.

Another good example of making managerial decisions in the field of innovation development is Russian company Lukoil which actively introduces innovations in all business areas to strengthen its position in the industry. For instance, the official website of the company states that managerial decisions aim at developing competitive advantages, which is achieved by active application of modern technologies, search for optimal technical solutions, expenses control, creating and using synergies within the vertically integrated production chain (Lukoil. Oil company, 2017).

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Analysis of the performance of other companies also allows us to talk about an established and stable trend in the field of strategic managerial decisions aimed at wide introduction of innovations in all areas of the company's activity.

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PECULIARITIES OF ANONYMOUS COMMENTS' MANAGEMENT: A CASE STUDY OF LITHUANIAN NEWS PORTALS

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Abstract. In the world of today's information technologies, data may spread through cyber space at the speed of lightning. News portals constantly update the information available at their disposal by posting new articles. In order to attract new readers and to retain existing ones, in addition to focussing on publishing quality content, portal managers work on continuously improving their sites. These websites may have various interactive features, among them the opportunity to comment on an article. In some news portals, the number of anonymous comments is particularly high. The activities of online commenters and the issues related to their anonymity have always generated heated discussion owing to a number of reasons, including the content of the comments, the right of the commenters to remain anonymous and the extent to which the portal manager could be held liable. News portals equipped with an anonymous commenting function give rise to a culture of online bullying and hate-mongering where the cyber-criminals feel immune from punishment and existing control measures are insufficient for addressing the problem. The advocates of anonymous commenting argue that it promotes freedom of expression and portal administrators claim they can control defamatory and offensive anonymous comments by deleting them. The article discusses the theoretical aspects of anonymity, anonymous commenting and anonymous comments. Based on a case study of the most popular news portals in Lithuania, and, in particular, on a comparative analysis of the privacy policy and the environment for commenting in three of them, the authors offer empirical data on the ratio between the number of comments and that of the commenters. The main purpose of the article is to reveal the peculiarities of anonymous comments' management of the news portals that enjoy the greatest popularity in Lithuania.

Keywords: anonymous comments; hate speech; privacy; news portals, Internet

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JEL Classifications: D80, M15, M10

1. Introduction

According to Ferry (2002), the word "anonymous" was introduced into the English language during the sixteenth century. Meaning "without a name" or nameless, it was borrowed from the Greek and referred to writings whose authors were unknown or concealed. Throughout history individuals have been writing in anonymous or pseudonymous ways. Anonymous and pseudonymous expression allows individuals to express unpopular opinions, honest observations, and otherwise unheard complaints. Anonymity has long been thought to encourage

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bad behavior, either by changing the salient norms (Reicher et al., 1995), or through reducing the subjective need to adhere to norms by dampening the effect of internal mechanisms such as guilt and shame (Zimbardo, 1969).

In the digital age, the news media gives voice to anonymous speakers in two ways: reporters may extend confidentiality to sources in exchange for newsworthy information, or a news website may host an online comment function that allows readers to post their reactions to content pseudonymously (Hanamirian, 2012). The virtual environment is constantly changing (Raudeliūnienė et al., 2018), every individual can communicate online without connecting their online identities with their offline identities.

The issue of anonymity on the Internet divides opinions. On the one side there are many who maintain that anonymity on the World Wide Web is an essential feature of its nature, and of its freedom. On the opposite side are those who consider the Internet to be the same as any other public forum, where anonymity can only be the exception, not the rule (Zeno-Zencovich, 2014). The dark side of anonymity becomes apparent when it is used to shield the individual from accountability. It can be used to deceive (either maliciously or playfully), falsely accuse others, or evade responsibility for one's actions (Weicher, 2007; Šišulák, S. 2017).

The article is based on the case studies of most popular news portals in Lithuania, which were carried out with a view to the websites' most appropriate privacy policies and options related to commenting functionality.

The article revolves around the **scientific issue** posed by the lack of research on the peculiarities of commenting and comment management in the selected three Lithuanian news portals. News portals employ different privacy policies, anonymous users have an opportunity to write numerous comments and are thus able to shape the other readers' opinion. In addition, anonymous commenters are more likely to use taboo language, etc.

The **main purpose** of this article is to reveal the peculiarities of anonymous comments' management of Lithuanian news portals. This purpose was achieved through a variety of **tasks:**

1. Investigated the theoretical aspects of anonymity, anonymous comments, and situations of anonymous commenting.
2. Carried out a comparative analysis of the privacy policies adopted by Lithuanian news portals and the functionality of their respective commenting environments.
3. Completed an empirical study which revealed the ratio between the numbers of comments and commenters on a specific article in a news portal.

The study presented in the article was carried out using the following **methods**: comparative analysis, systematic analysis and quantitative empirical analysis.

2. Theoretical Aspects of Anonymous Commenting Situations

American scholar (Ekstrand, 2013) attempted to identify motives for speaking or publishing anonymously that were either beneficial or harmful. Beneficial motives included following convention, safety, engaging in spirited rhetoric, gamesmanship, disguising class or gender, and protecting privacy. Harmful motives included intimidation, insulation, concealment, and crime or fraud.

In contemporary environment in conditions of globalization predicting of development peculiarities and external factors' impact becomes especially urgent issue (Tvaronavičienė, 2018). In many parts of the globe, online comments have become an essential ingredient of a thriving news publication: readers feel that they have a right to make their contribution in an online environment that is becoming increasingly more dialogue-based than one-way broadcasting. The ability to comment on news articles or in discussion forums offers readers the chance to

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indulge in debate on hot topics hosted by their favourite news organisations with other readers from all over the world. For news organisations, online comments can be an extremely valuable resource. They provide additional detail and insight to articles from informed readers who are passionate about the subject, offer a wide range of supplementary opinions and give newsrooms a window into how their readers see both their journalism and the world around them. Their feedback and perspectives can also broaden the publication's coverage from their vantage point, inspire new stories and provide possible sources or ways to address an issue (Goodman, Cherubini, 2013). Mass media plays a key role in shaping public opinion. With the increase in Internet use, mass media has become a tool for people to express their perspectives and read the opinions of others. Readers can participate in shaping opinion not only as information seekers, but also as information providers, because Internet news websites provide users with spaces to interact with the news, responding to stories and sharing their opinions with other online news participants (Ahn, 2011).

An individual's perception of others' opinions is one of the important components of public opinion. According to social comparison theory, public opinion is shaped continuously as people compare their opinions to those of others. When no objective criteria exist for evaluating their own opinions, people have a tendency to compare themselves to others. In other words, people are motivated to determine socially acceptable opinions by assessing the perspectives of others compared to their own (Festinger, 1954). Individuals join social environments in order to access others' opinions, and consequently, their attitudes and behaviors often change (Kim, Sun, 2006).

The Internet is an anonymous environment where it is easy to seek out and explore one's niche, however idiosyncratic. Consequently, antisocial individuals have greater opportunities to connect with similar others, and to pursue their personal brand of "self expression" than they did before the advent of the Internet (Buckels et al., 2014). As people read news on the Internet, they are also exposed to other readers' comments in response to the news stories. The comment forums on news websites offer a sphere where readers can ommunicate as both providers and receivers, and the comments provided may influence how news readers shape their opinions. An important problem plaguing websites that allow users to leave feedback, having a negative impact on their online business and overall user experience (Djuric et al, 2015). Comparing the tone of thousands of online comments posted by anonymous and nonanonymous users following online newspaper stories, Santana (2014) found that 53.3 percent of anonymous comments included language that was vulgar, racist, profane or hateful; only 28.7 percent of non-anonymous comments were found to be uncivil.

Hate speech is a particular form of offensive language that makes use of stereotypes to express an ideology of hate. Nockleby (2000) defines hate speech as "any communication that disparages a person or a group on the basis of some characteristic such as race, color, ethnicity, gender, sexual orientation, nationality, religion, or other characteristic. Many people are resentful and dissatisfied with the subpar quality of their lives: the poor working conditions, the extra financial burdens arising from bank loans, the unsatisfactory relationships with their spouses or partners, all of which produce high stress levels and depression. For such angry individuals, the bullying and hate-mongering on social media platforms becomes a form of rebellion and self-realization. Users deliberately incite hatred and engage in bullying online because they are sure they will be able to avoid punishment. The managers of online social media platforms, on the other hand, do not have access to any effective method for curbing inappropriate comments and ensuring user protection. The virtual social network model is primarily based on the collection and sharing of personal data by the data subject. (Limba, Šidlauskas, 2018).

Attempts to improve online behavior through non-coercive means have followed one of two general approaches (Kiesler, 2012). Some websites try to directly influence social norms by explicitly stating the expected standards of behavior in their online community ("netiquette"). On the other hand, numerous newspapers and blogging sites motivate people to adhere to social norms by reducing anonymity through measures such as only allowing registered users to leave comments on web pages (Krysowski, Tremewan, 2015). To combat abusive language,

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many internet companies have standards and guidelines that users must adhere to and employ human editors, in conjunction with systems which use regular expressions and blacklist, to catch bad language and thus remove a post (Nobata et al., 2016). Detecting abusive language is often more difficult than one expects for a variety of reasons. The noisiness of the data in conjunction with a need for world knowledge not only makes this a challenging task to automate but also potentially a difficult task for people as well (Table 1).

Table 1. Reasons why detecting abusive language is difficult

More than simple keyword spotting
Difficult to track all racial and minority insults
Abusive language may actually be very fluent and grammatical
Abusiveness can be cross sentence boundaries
Sarcasm

Source: Nobata et al., 2016

Hateful and insulting comments on social media platforms may be divided into several groups:

1. Unconscious (unintentional): The comment is spontaneous and occurs without any prior planning and without targeting a specific audience; the author of the comment does not realize that they are being hateful.
2. Conscious (intentional): The comment is made with the deliberate intent to insult someone or to incite hatred but it is not aimed at any specific target audience.
3. Targeted: The hostility is directed at a particular audience (such as Africans or Jews) that has been selected in advance.
4. Systematic/repetitive: The hostility is directed at a particular audience (such as blacks or Jews) that has been selected in advance and is constant, e.g. 100 comments written over 24 hours.

Frequently, the hate-mongering is directed against the disabled and individuals with non-traditional sexual identities, as well as against the representatives of other races, nationalities, religions, and cultures. Moreover, the discord may be instigated for economic purposes, for example, by systematically targeting a competitor in a particular business branch. The most common form of bullying and hate-mongering is recreational (done for entertainment) and may be directed at anybody for any reason, no matter how random, such as, for instance, an unusual physical appearance, one's rsonality, social status, etc.

The following factors may encourage users to incite hatred: distrust toward the state and its efficiency; biased opinions voiced by the media that do not coincide with the position of the vast majority; social inequality and poverty; poor education, low culture and lack of proper manners; low self-esteem and a desire to rebel.

Online news comments can be moderated in a variety of ways. One involves using automated filtering systems to block comments including swear words or foul language. This approach, however, is not always adequate – for instance, comments on sensitive topics (such as politics or religion) may be offensive without actually containing offensive terms. An alternative solution relies on crowdsourcing (Mishra, Rastogi, 2012), letting the set of commenters' selfdiscipline by – for instance – upvoting or downvoting a comment. Another approach consists in forcing commenters to publicly and personally identify themselves – under the expectation that public identification may lead to more civil discourse.

Commenters are more likely to use offensive words under the less identifiable conditions. Instead of either using excessive identification policy instruments or maintaining a state of high anonymity, suggest that the use of a Social networking services (next- SNS) account might naturally lead to self-disclosure of identity. Commenters

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using their SNS account, therefore, are (consciously or unconsciously) less likely to be online flamers or trolls (Cho, Acquisti, 2013). Reader (2012) points out that if anonymous comments are not permitted on news sites, the comments will more closely approximate the journalistic quality of the news media on which they are posted. The expected advantage of not allowing anonymous comments is the improvement in quality, which subsequently leads to a decrease in moderation costs. The downside of not allowing anonymous comments is the possibility that divergent voices will not be heard.

Media try to improve the quality of comments by using a strict comment management strategy. House rules, registration, post-moderation, pre-moderation, report buttons to report abusive comments, and social media plugins (to login with a social media account) can be used. News media may even disallow any comments on their news sites or decide to close the comment features on sensitive or controversial news items. Bakker (2010) indicates that pre-registration leads to fewer complaints about comments, but also results in fewer comments as it takes more effort to post a comment with this system. Santana (2014) endorses this principle about the influence of pre-registration on the quality of comments. When comments are posted, news media can choose to moderate the comments before or afterwards. Pre-moderation is labour-intensive and therefore costly. Reich (2011) concludes that this could be the reason why large news businesses opt for post-moderation combined with pre-registration.

If the administrator of the news portal decides to disable the anonymous comment feature, there may be a significant decline in the overall number of the comments. In this case, the option to comment could be reserved for registered users. There are two possible ways to identify a user:

1. Identity verification through an online social networking platform, such as Facebook or Google;
2. Identity verification by means of logging into a registration system managed by the service provider, where the user has to specify his or her name, surname and e-email address.

However, these methods do not guarantee that a person will enter their genuine data, either while registering a profile with a social network or while registering as a new user in the provider's system. However, they do at least make it more difficult to post large numbers of anonymous comments. Theoretically, of course, one can register multiple fake profiles, but it is time-consuming and complicates the process of logging in, entering the comment, logging out and logging back in with another username. If every service provider in Lithuania introduced this as a compulsory requirement for registration, the total number of comments would be reduced considerably, since in order to write anonymous comments in abundance one would need to have hundreds of registered user accounts.

3. An Analysis of Commenting Environments and Commenting Policies

News portals constantly update the information available at their disposal by posting new articles. In order to attract new readers and to retain existing ones, in addition to focussing on publishing quality content, portal managers work on continuously improving their sites. These websites may have various interactive features, among them the opportunity to comment on an article. The exact features intended to ensure commenting functionality depend on the particular news portal.

Login and Identification one of the first questions news organizations must consider with respect to publishing online comments is the login and user identification process. The main task of access control is to control which entities have the right to access specific system resources (Šidlauskas, 2017). Identification procedures can be classified into three broad categories, depending on whether they:

1. Allow readers to create a customizable username or pseudonym and comment anonymously without registration to the website. This type of sign-in gives users complete freedom to leave anonymous comments;

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2. Require readers to log in via a social networking account. When a user logs in, the data from their profile on the social networking platform are used to verify their identity. The exact personal data requested may vary from one news portal to another. For example, when logging in through the Facebook platform, one is typicaly asked for the user's email address and public profile (required) - their name, profile picture, age range, country, language, gender and other public information. The login method may be regarded as ambiguous insofar as personal privacy is concerned, since the social media profile may be authentic, i.e. contain the user's actual name and other data, or the user may hide behind an alias.
3. Require readers to log in to website and use their real names when posting comments. In theory, the user is supposed to submit their personal data (name, surname, e-mail) to the news portal during the registration process and to think of a password to be used for logging in. No guarantee exists that the user will provide their actual data.

Upon assessing the methods used to identify users and to log in, one can argue that users are given an opportunity not to reveal their true identity and to remain anonymous while commenting (Fig. 1).

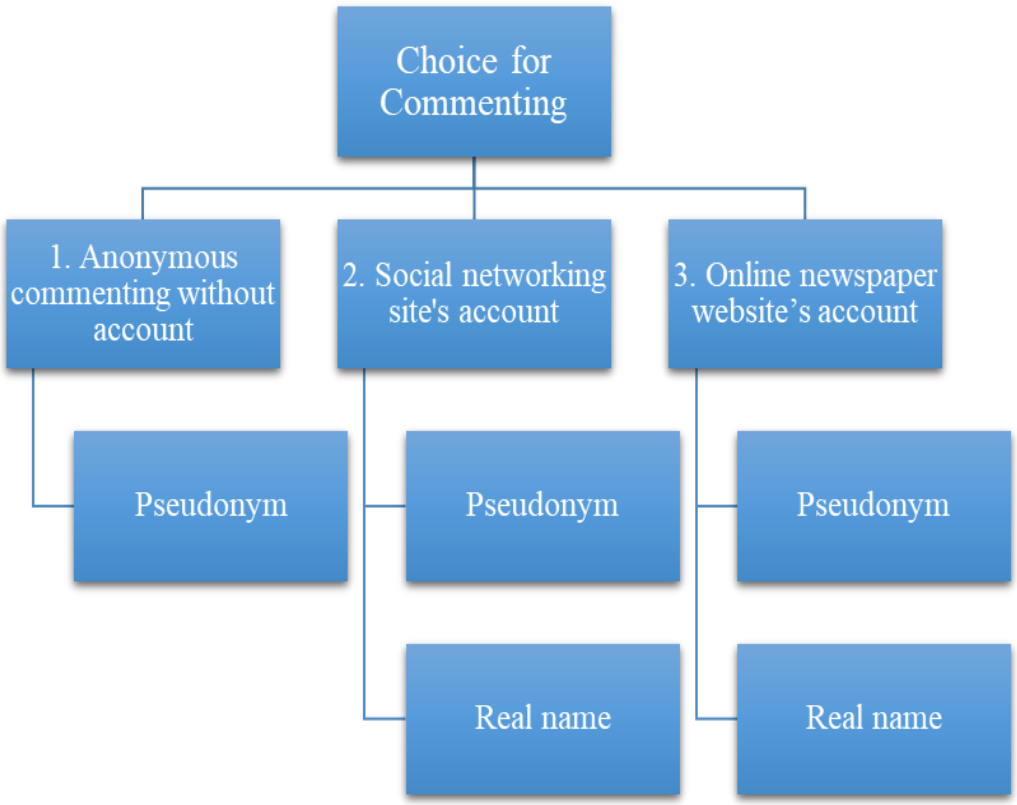


Fig. 1. Model for selecting user commenting options

Source: authors

It may seem odd that news organizations, which generally embrace or demand transparency, also often champion a right to publish stories based on anonymous sources or sponsor websites that allow readers to comment on stories anonymously or through assumed names (Heatherly et al., 2014). For instance, strict identity verification policies (i.e., the absence of anonymity) could deter users' online participation (Cho, Kim, 2012). In contrast,

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some studies paradoxically highlighted that highly anonymous conditions can discourage voluntary contributions because individuals are less motivated in the absence of social interactions and recognitions by others (Andreoni, Petrie, 2004). In addition, elements of anonymity may or may not produce a high likelihood of antinormative behaviors (Suler, 2005). Online news organizations' choice between anonymous, pseudonymous, or fully identified commenting systems may have significant effects on readers' choice to participate in them and on their subsequent commenting behavior.

Researchers and practitioners argue that real names can help "promote trust, cooperation, and accountability" (Millen, Patterson, 2003), whereas anonymity may make communication impersonal and undermine credibility (Rains, 2007).

When a user writes a comment, the commenter's name is indicated nearby. Other information pertaining to the user and the comment may also be provided, including the time, country, comment number and IP address. An IP address is unique address that identifies a device on the Internet or a local network. It allows a system to be recognized by other systems connected via the Internet protocol (Christensson, 2011). Legal scholar Daniel Solove (2007) has noted that online, true anonymity usually is unavailable. Because every computer portal to the Web has a unique Internet Protocol (IP) address that is logged every time a user visits a website, one's anonymity is nearly always traceable. Anonymizing services can help obscure or erase Internet footprints, but most people do not take advantage of such services, which also are not fool-proof.

Comment rating and sorting is a widely used feature on news portals. Users are given an opportunity to rate comments by marking them with "like" or "dislike", which is how the comment gains popularity. The sorting function enables the user to choose which comments to give priority to while reading. The individual options for sorting comments depend on the news portal and may include the latest, the oldest, the best and the worst.

Some news portals allow users to respond to a specific commenter's comment. Through exposure to the responses and feedback of other readers, online news consumers gain a broader and more comprehensive experience than would be possible by reading or viewing other types of news (Yang, 2008). A common consequence of using this function is that users deviate from the main topic of the article and concentrate on the thoughts of a particular person, which, in the presence of diverse and often contradictory opinions, increases the likelihood that abusive language will become prevalent.

An important control mechanism used by news portals to limit comments that violate the commentary rules is the option for a user to flag an inappropriate comment. Users can report the comment to the news portal, which can assess the situation accordingly and, if necessary, delete it from the system.

For the sake of efficient comment management, many news portals formulate commentary rules and introduce them to the users. Such rules may specify (Table 2).

Table 2. Commenting guidelines

Comment purpose	Expressing an opinion on an article published by the portal, sharing additional information and ideas, debates with one's opponents.
User identification and login type	Anonymous commenting without any registration or login required; commenting after logging in through a social networking platform; commetning after logging into the news portal's system.

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Data on the comment and the commenter	Time, country, comment number, user IP address etc.
Comment management	Rating, sorting, deletion, responses to a given comment etc.
Publishing period	News portals publish comments for a limited period of time (e.g. 14 or 30 days) on the grounds that later they become irrelevant.
Storage period	Based on legislation.
Comment administration	Every comment is evaluated prior to being published in the news portal by the person responsible for doing so; comments are evaluated after being published by the person responsible for doing so; specialized software is used to identify and delete the comments that violate the comment policy.
Specifies the reasons behind the refusal of the news portal to publish a particular comment	Taboo language; the browser does not support cookies; the user has been banned for violating the rules on commenting.
Comment blocking (depriving a user of the right to comment)	Specifies the reasons for banning a user and the duration of the ban.
Prohibitions used by news portals as a basis for deleting comments	Comments that incite national, racial, religious, sexual and other hatred; taboo language; offensive or threatening comments; advertisements.
Liability	Specifies a user's liability for inappropriate comments, as well as the liability of the news portal.
Options for informing the news portal about an inappropriate comment	Marking inappropriate comments provided the relevant technical opportunities are present; informing the news portal via email.

Source: authors

Publish and update discussion guidelines, comment policies, or community rules. According to the WAN/IFRA study, discussion guidelines should consist of "clear, thorough, transparent suggestions that enable the news organization to host an intelligent discussion and defend [its] moderation decisions". Comment policies should explicitly forbid any and all forms of hate speech and illegal content. At the same time, rules should not overwhelm commenters with a long list of 'don'ts,' but provide proactive guidance, including:

1. Details about the discussion environment that is sought;
2. Clear definitions of hate speech, defamation, libel, etc.;
3. Promotion of dialogue and opportunities for response;
4. Encouraging commenters to back up their opinions with data and facts;
5. Keeping the commenters focused on the issue at hand, rather than on attacking individuals.

As news organizations find the balance between strategic priorities and cost, it is important that each continues to try to re-engage directly with their audience and maintain control of user data, which is increasingly valuable. In the age of social media, user behaviours change rapidly and the urgency for news organisations to adapt and change is everpresent (Huang, 2016).

News portals are completely free to devise any commenting environment they prefer and to choose the functions to be used to manage that environment, as well as the commenting rules that must be followed by the users. Šidlauskas (2015) states that very important to have high quality and consumption expectations which justify the web page. Alavijeh et al. (2018) states that the value can be maintained through high service quality. Each portal may have different objectives, such as ensuring a convenient environment and quality comments, preventing inappropriate comments, maximizing the number of readers, etc. According to the statistical data obtained from Alexa.com, the three most popular news portals in Lithuania are Delfi.lt, 15min.lt and Lrytas.lt. The table below contains a comparison of the commenting environment, its functional features and the comment policy among these three portals.

Table 3. Functional peculiarities of the commenting environment and rules for commenting

Peculiarities	**Three of the most popular news portals in Lithuania**

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News portals	Delfi.lt	Lrytas.lt	15min.lt
Login/commenting variety	1. By logging into the local system of the news portal. 2. No login required (anonymous). 3. Through a social network.	1. No login required (anonymous).	1. By logging into the local system of the news portal. 2. Through a social network.
Comment publishing period	30 days	14 days	No information
User familiarization with the rules for commenting	Yes	No	Yes
Norms for inappropriate comments formulated	Yes	No	Yes
Liability for inappropriate comments	User	User	User
Comment control/management	Pre-moderation	Post-moderation	No information
Comment sorting	Yes	Yes	Yes
Responses to comments	Yes	No	Yes
Button for flagging inappropriate comments	Yes	No	Yes
Commenter IP address displayed	Yes	Yes	Yes
Comment rating	Yes	Yes	Yes

Source: authors

The following conclusions may be drawn from Table 3:

1. Two out of the three portals have the option of commenting anonymously without logging in. Only registered users are permitted to leave comments on the third portal;
2. Delfi.lt news portal publishes comments for 30 days, while Lrytas.lt does so for 14 days. The 15min.lt website does not specify a particular deadline for publishing comments;
3. Lrytas.lt news portal does not familiarize its users with the rules for commenting, the privacy policy does not specify which comments are inappropriate and there is no opportunity to report inappropriate comments with a single click.
4. The news portals do not accept any responsibility for inappropriate comments, users are liable under the relevant legislation;
5. All of the three news portals display the commenter's IP address and allow users to rate and sort comments;
6. The conditions on the news portals are conducive to publishing inappropriate comments and other manipulating information in other ways, since comment control is carried out only after the comment is posted and becomes visible to the public.

4. Peculiarities of Commenting in Lithuanian News Portals

The option to leave anonymous comments allows news portals to increase their popularity and readability ratings. Users are eager to read and write comments, but the question is whether these comments always reflect the actual opinion of most commenters.

Research methodology: To carry out this quantitative empirical analysis, the authors in March 2018 chose an article on the same subject in each of the three most popular Lithuanian news portals and proceeded to analyze the comments. According to the statistical data obtained from Alexa.com (2018), the three most popular news portals in Lithuania are Delfi.lt, 15min.lt and Lrytas.lt.

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Data is the empirical basis for any research, and it can be specified that only the data collected in an appropriate manner are reliable and reasonable (Kardelis, 2002). The qantitative empirical research done by analysing data collected via web news portals. The analysis of the comments enabled the authors to calculate:

1. The ratio between anonymous comments and single sign-on comments.
2. The ratio between the number of the commenters and that of the comments.
3. The shaping of a minority opinion (in the case of Delfi.lt news portal).

Results: The total numbers of the registered and anonymous comments are presented in Char 1. One can see that the anonymous comments are more numerous. The news portal 15min.lt only permits comments from users who are logged in, whereas in the case of Lrytas.lt news portal, all comments are anonymous.

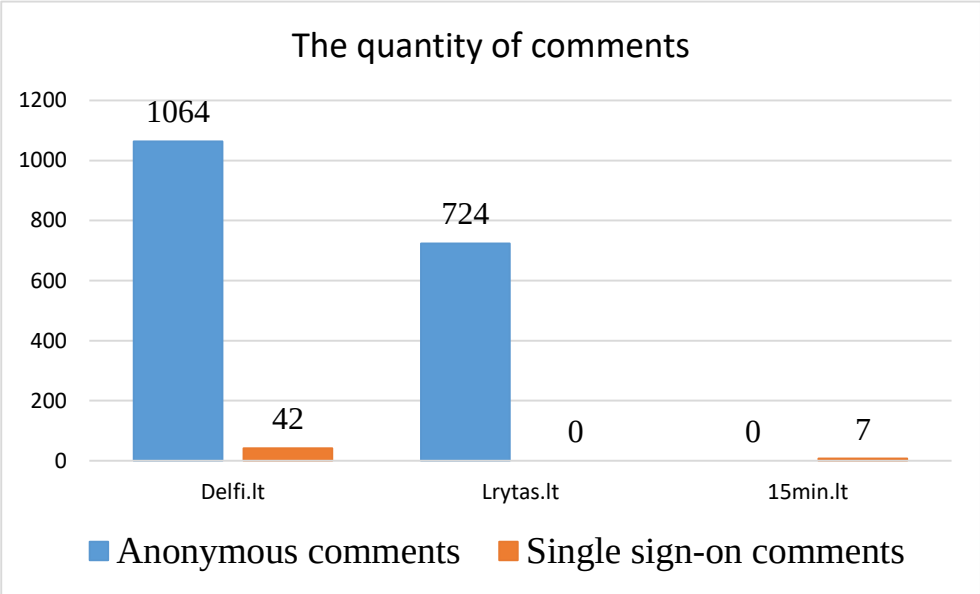


Chart 1. The number of registered and anonymous comments

Source: compiled by authors

The number of anonymous comments and the respective commenters is presented in Char 2. The example of the news portal Delfi.lt illustrates that the number of comments exceeds that of the commenters severalfold, as the same person usually writes two or more comments.

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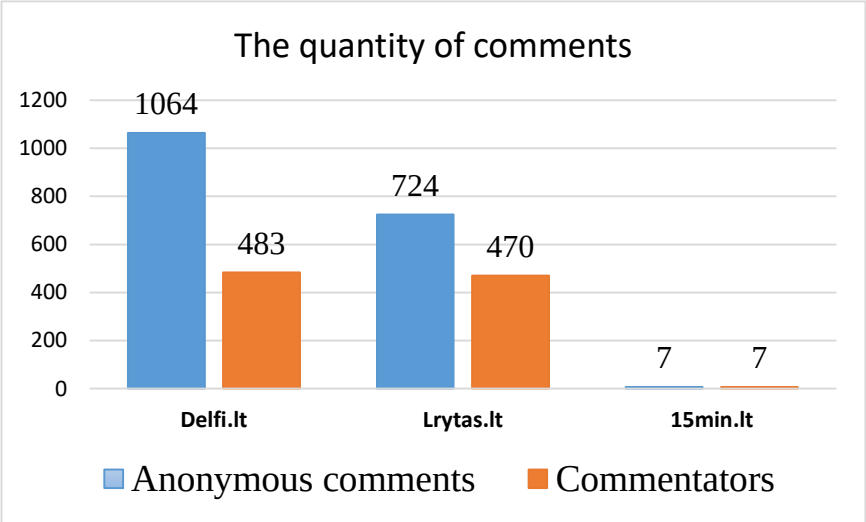


Chart 2. The number of anonymous comments and their commentators

Source: compiled by authors

The process of shaping a minority opinion (in the case of Delfi.lt news portal) is presented in Char 3. 32 anonymous commenters wrote 419 out of 1064 comments and thus formed 39% of the total comment content.

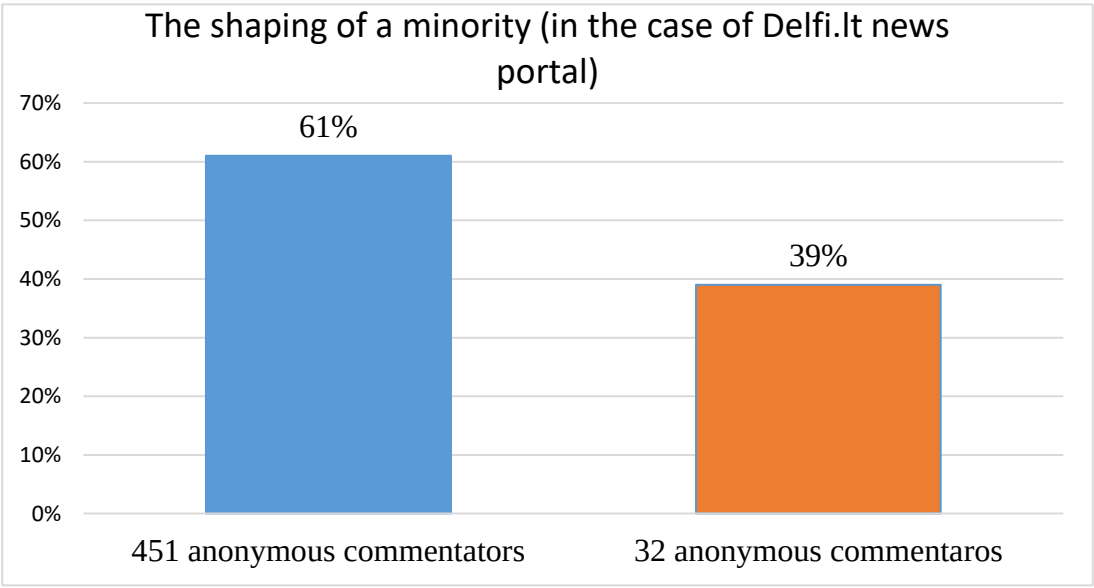


Chart 3. The number of anonymous comments and their commentators

Source: compiled by authors

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The empirical study has shown that most visitors to Lithuanian news portals tend to leave comments anonymously and ignore other forms of commenting. The option of commenting anonymously without logging in enables commenters to post large numbers of comments under different aliases, thus generating the overall content of the information provided.

Conclusions

Upon analyzing the opinions expressed in the academic sources, one can argue that the commenting function plays an important role for news portals. Online comments can be quite a valuable resource for news agencies as users spend more time on the web page reading other users' comments and posting comments of their own. News portals are completely free to devise any commenting environment they prefer and to choose the functions to be used to manage that environment, as well as the commenting rules that must be followed by the users. Three commenting methods have been identified: anonymous commenting without prior registration, commenting after logging into a social networking platform and commenting after registration with the news portal.

Anonymous commenting is related to freedom of expression, but news portals do not provide any guarantee that the anonymous comments are authentic and had not been left by a group of interested parties who were requested to express a particular opinion in advance. The fact that the comments on a news portal are visible for a short time does not add to the transparency and serves as an obstacle to more extensive and detailed studies. The results of the empirical study point to the conclusion that the anonymous commenting feature gives rise to various abuses and enables certain parties to actively shape public opinion. Anonymous comments may be intended to have one social group develop an incorrect opinion about another, to promote disagreement and conflict, and to encourage distrust toward the state and its institutions, which is already a matter of national security.

News portals will delete inappropriate comments, but this only happens after the comment is posted and has been visible to the public for some time. The users of Delfi.lt and 15min.lt news portals are able to inform the managers of the news portal about inappropriate comments at the click of a button. Inappropriate comments include messages that incite national, racial, religious, sexual and other hatred; taboo language; insulting and threatening comments; and advertisements. The automated measures aimed at identifying inappropriate comments are not yet sufficiently advanced to ensure adequate protection. Since anonymous commentes feel free to act with impunity, such comments are a common sight on Lithuanian news portals. It is important to mention that, following the judgment of the European Court of Human Rights in Delfi v. Estonia, it was determined that the provider of the internet services is to be held liable for offensive anonymous comments.

If the administrator of the news portal decides to disable the anonymous comment feature, there may be a significant decline in the overall number of the comments. In this case, the option to comment could be reserved for registered users. Of the three Lithuanian news portals analyzed, 15min.lt news portals is the only one not to have the anonymous commenting feature. By controlling the comments, the managers of information portals would make sure that inappropriate comments were not distributed before being posted and becoming visible to the public. And the final, small number of commentators using the option of anonymous comments can have a very significant effect on the overall context of the commentary and the formation of public opinion. This study is useful for further research in analyzing strategic proposals both in practical and theoretical aspects.

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PERSPECTIVES OF SOLVING THE PROBLEMS OF REGIONAL DEVELOPMENT WITH THE HELP OF NEW INTERNET TECHNOLOGIES

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Abstract. The purpose of the work is to determine the key problems of regional development in modern Russia and to substantiate the perspectives and model the process of their solving with the help of new Internet technologies. For full coverage of the problems of regional development in modern Russia, they are analyzed from the positions of public perception and level of dynamics of the statistical data that characterize these problems. At that, the methods of logical and statistical analysis are used. The information and analytical basis of the research includes the materials of the All-Russian Public Opinion Research Center, Federal State Statistics Service of the Russian Federation, and independence expert and analytical organization RIA Ranking for 2014-2017. As a result, the authors substantiate that implementation of new Internet technologies is a perspective means of solving the problems of regional development in modern Russia. These problems concern optimality of interaction of non-government economic subjects (society and entrepreneurship) between each other, which leads to low business activity, complexity of employment, and low income, and non-optimality of interaction between non-government economic subjects and the state, which leads to inaccessibility and low quality of state services and public benefits, including healthcare, communal and housing sphere, infrastructure, etc. Implementation of new Internet technologies into entrepreneurship allows reducing its capital intensity, increasing business activity, simplifying the process of employment, and increasing accessibility (reduce cost) of goods and services for the population. Due to implementation of new Internet technologies into activities of state organizations, which provide state services and public benefits, their controllability and manageability by society is achieved – which stimulates increase of their quality and accessibility. A proprietary model of solving the problems of regional development in modern Russia with the help of new Internet technologies is developed.

Keywords: problems of regional development; Internet technologies; modern Russia; sustainable entrepreneurship

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1. Introduction

Under the influence of globalization of the world economic system, its participants are aggregated and enlarged – as well as their interests. National and supra-national (international) regulators focus on the global problems of humanity, as they are the largest and their successful solution is possible only with joint efforts of the global society. However, these problems, despite their global status, are manifested in different ways and have different meanings in modern socio-economic systems.

Orienting at solving the global problems of humanity, national regulators often redistribute resources of national economy in favor of support of economies of other countries. Acting in the interests of prevention of new global crises, they may insufficient attention to the problems of development of domestic socio-economic systems, which contradicts the interests of their population. As a result, the positive effect, which is visible at the global level, could be zero or negative at the national level.

Thus, a new problem of modern times appears – it also deserves the global status, as it is observed everywhere and has the key role for humanity. This is insufficient attention of national regulators to internal problems, which is manifested at the level of regions in the national economic system, which leads to reduction of living standards of population. That's why problems of regional development of modern developed and developing countries deserve the same attention as the global problems of modern times, which are manifested and solved in the third world countries.

The working hypothesis of the research is that a perspective means of solving the problems of regional development in modern developed and developing countries is implementation of new Internet technologies. The research object in this work is modern Russia – it has an intermediate position between developed and developing countries. The purpose of the work is to determine the key problems of regional development in modern Russia and to substantiate perspectives and modeling of the process of solving them with the help of new Internet technologies.

2. Materials and method

Problems of regional development of modern developed and developing countries are studied in the works (Golikova et al., 2018), (Golova et a., 2017), Prangishvili et al., 2017), and (Shahraki, 2017). Possibilities and perspectives of using new Internet technologies are studied in the works of such authors as (Inshakova et al., 2017), (Kravets et al., 2013), (Kuznetsov et al., 2016), (Popova et al., 2015), (Przhedetskaya and Akopova, 2016), (Sibirskaya and Shestaeva, 2016), and (Sukhodolov et al., 2018), (Ragulina et al., 2018), (Bogoviz et al., 2017), (Bogoviz et al., 2016), (Zemlickiene et al., 2017), (Tvaronavičienė et al., 2018).

As a result of performed literature overview, it is possible to conclude that components of the selected topic have been studied separately, whole the comprehensive scientific view on the perspectives of solving the problems of regional development with the help of new Internet technologies has not yet been formed, which leads to the need for complex research on this topic.

For the purpose of full coverage of the problems of regional development in modern Russia, here they are analyzed from the positions of public perception (qualitatively) and from the positions of the level and dynamics

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of values of statistical data that characterize these problems (quantitatively). At that, the methods of logical and statistical analysis are used. The information and analytical basis of the research includes the materials of the All-Russian Public Opinion Research Center, Federal State Statistics Service of the Russian Federation, and independence expert and analytical organization RIA Ranking for 2014-2017. The statistical data are given in Table 1.

Table 1. Dynamics of value of the indicators of socio-economic regional development in Russia in 2014-2017

Indicators	2014	2015	2016	2017
Real money income, % to previous year	99.3	96.8	94.2	98.3
Ratio of those involved in region's economy to the number of population of working age, %	80.1	80.6	86.1	85.4
Coefficient of tension in the labor market	2.1	3.3	3.3	2.7
Share of profitable companies, %	65.4	65.8	66.0	66.1
Share of housing fund with all types of utilities, in aggregate area of housing fund, %	63.5	61.1	65.5	66.0

Source: compiled by the authors based on: (Federal State Statistics Service, 2018), (RIA Ranking, 2018).

3. Results

The actual problems of Russians, which were determined in the course of sociological survey by the All-Russian Public Opinion Research Center in 2017, are structured and presented in Figure 1.

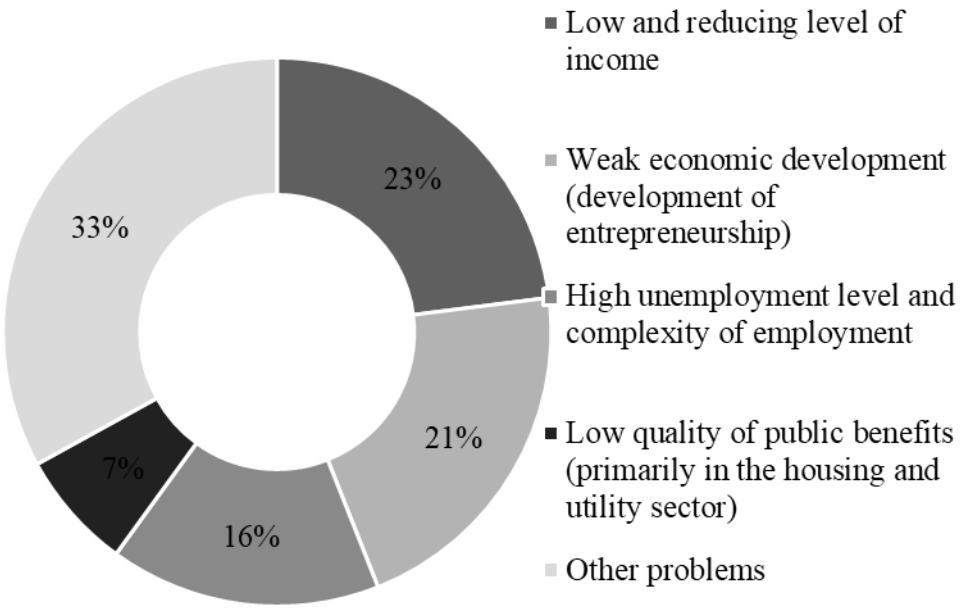


Fig. 1. Structure of actual problems of Russians in 2017.

Source: compiled by the authors based on: (All-Russian Public Opinion Research Center, 2018)

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Let us study the determined problems in detail. The main problem (23%) of regional development in modern Russia is low and reducing level of income. Statistical data of the Federal State Statistics Service confirm existence and deepening of this problem in Russia. Thus, in 2014-2017 there was annual reduction of the level of real income of population. In 2017, it constituted 1.7% (Federal State Statistics Service, 2018).

The second position (21%) belongs to the problem of weak economic development, which is expressed in low level and rate of development of entrepreneurship in regions of Russia. According to the Federal State Statistics Servicea, share of profitable companies on average for Russia's regions grows annually (average annual growth rate is 0.35%) but is at the low level. Thus, in 2017 the share of profitable companies in Russia constituted 66.1% (Federal State Statistics Service, 2018), which shows unfavorable business climate and low effectiveness of entrepreneurial activities.

The third (16%) problem that troubled Russians in 2017 was high employment rate and complexity of employment. According to the Federal State Statistics Service, ratio of the employed in region's economy to the number of population in working age grows, constituting 85.4% in 2017 (Federal State Statistics Service, 2018). This means that 14.6% of able-bodied citizens do not have a job. In addition to this, coefficient of tension in the labor market, which is calculated as ratio of average annual number of the unemployed to average annual number of vacancies, provided by employers to state employment services, grows annually, constituting 2.7 in 2017 (Federal State Statistics Service, 2018). That is, the number of unemployed exceeds the number of official jobs by 2.7, which shows large urgency of the problem of unemployment in Russia.

The fourth position (7%) among the urgent problems that troubled Russians in 2017 belongs to the problem of low quality of public benefits, primarily – in the sphere of housing and communal services, which should be treated as infrastructure on the whole. According to the materials of the Federal State Statistics Service, the share of housing fund, provided with all forms of urban amenities, grows annually, constituting 66% in 2017 (Federal State Statistics Service, 2017). Therefore, 34% of the housing fund needs renovation. Other problems, which account for 33%, include the problems of inaccessibility and low quality of medical and other state services.

As a result of systematization of the determined problems of regional development in modern Russia, we determined two main categories, which reflect the reasons for their emergence. The first category: non-optimality of interaction between non-government economic subjects (society and entrepreneurship). It includes the problem of low level of development of entrepreneurship, which leads to the problem of unemployment and low incomes.
The second category: non-optimality of interaction between non-government economic subjects and the state (suppliers of government services and public benefits, which are related to the state not according to the property form but according to specialization for execution of state functions). It includes the problem of inaccessibility and low quality of state services and public benefits, including healthcare, housing and utility sector, infrastructure, etc.
The model of complex solution of the above problems of regional development in modern Russia with the help of new Internet technologies is presented in Figure 2.

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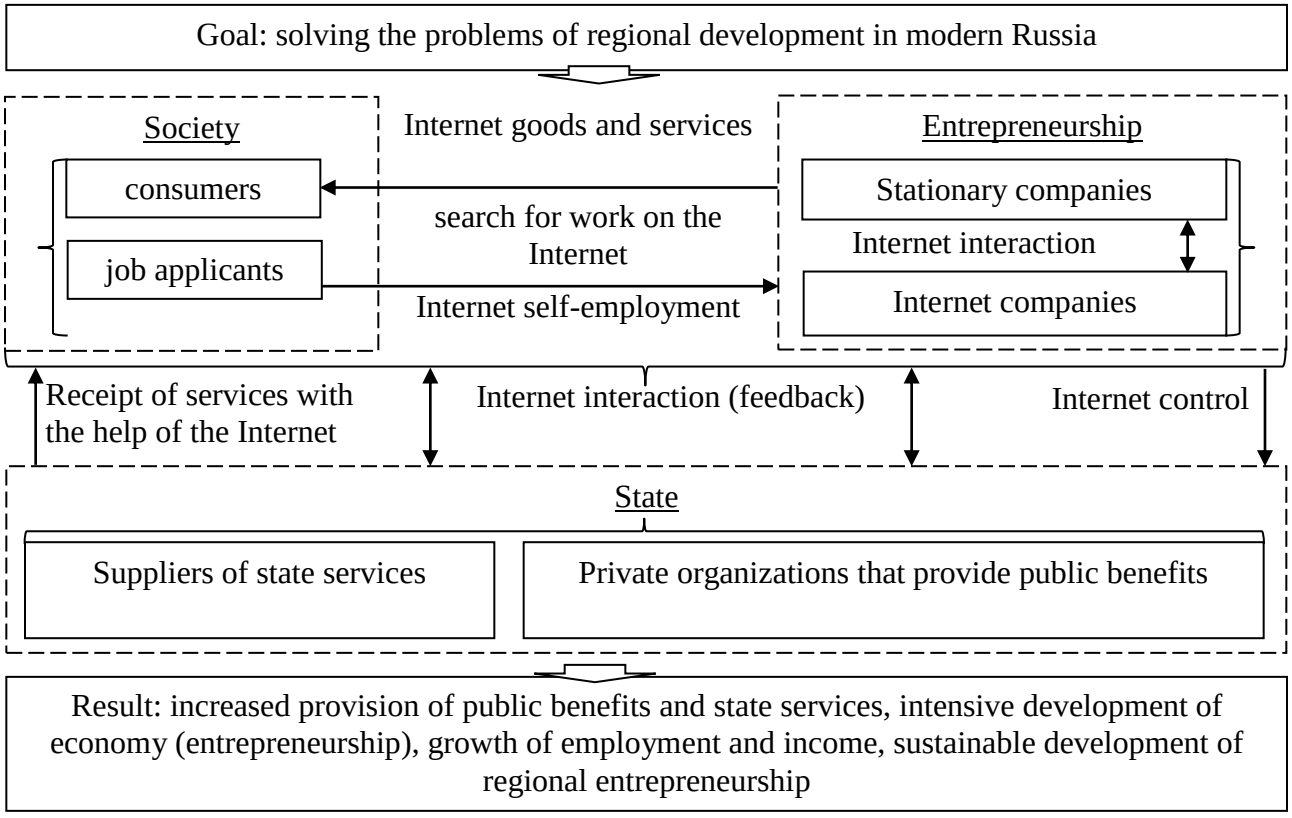


Fig 2. Model of solving the problems of regional development in modern Russia with the help of new Internet technologies
Source: compiled by the authors

Figure 2 shows that application of Internet technologies should be oriented at activation of electronic interaction between non-government economic subjects and between them and the state. This interaction could (and should) take the following forms:

– Internet entrepreneurship (as self-employment), which allows increasing the level of business activity due to lower barriers of entering the sectorial markets for Internet companies that are characterized by low capital intensity;

– provision of Internet goods and services to consumers, for lower price, with larger choice, better terms of purchase (anytime anyplace) with similar quality, which allows increasing the volume of goods and services that are accessible to consumers with the same income;

– Internet interaction between stationary and Internet companies that opens wider possibilities for their integration (including, for example, clustering) and increase of positions in the market;

– search for a job on the Internet and employment in Internet companies that provide access to fuller list of vacancies, their comfortable classification and selection, and quick and convenient passing of interviews and hiring;

– receipt of state services with the help of the Internet (including, for example, electronic registration for an appointment to doctor), which allows increasing their accessibility (convenience of receipt);

– Internet control of provision of state services and public benefits, which supposes high level of transparency of this process by means of placing state reports on the Internet;

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– Internet interaction (feedback), which allows expressing public opinion (including dissatisfaction) regarding provision of state services and public benefits, setting requirements, and providing recommendations for their improvement.

Aggregate results include improved provision of public benefits and state services, intensive development of economy (entrepreneurship), growth of employment and income – i.e., successful complex solution of all determined problems of regional development in modern Russia.

4. Discussion

The additional advantage that appears as a result of implementing the developed model is sustainable development of regional entrepreneurship. In view of the fact that according to the modern scientific economic paradigm, entrepreneurship is the basis of functioning of economic systems (including regional systems), this advantage allows starting the process of economy's growth, thus ensuring not its short-term narrow effect but the complex chain of positive effects for region's economy.

It should be noted that all determined topical problems of regional development of modern Russia's economy are directly or indirectly related to sustainability of entrepreneurship and have the institutional nature. Thus, the second category of problems that are related to non-optimality of interaction between private economic subjects and the state is the reason for unsustainable development of entrepreneurship in modern Russia. As a matter of fact, this category of problems causes insufficient development and low effectiveness of institutional provision of entrepreneurial activities in the region.

The first category of problems that are related to non-optimality of interaction between private economic subjects is a result of unsustainable development of entrepreneurship in modern Russia. This category of problems causes insufficient development and low effectiveness of the very institute of regional entrepreneurship. Implementation of new Internet technologies into the regional socio-economic system allows solving the problems of regional development in modern Russia due to positive influence on the central link of these problems, by providing sustainability of regional entrepreneurship's development.

The institutional nature of the problems of regional development in modern Russia leads to their high complexity, as institutional changes require not only systemic measures of state regulation but also social (from society and business) approval and support. Therefore, successfulness of practical implementation of the compiled conceptual model of solving the problems of regional development in modern Russia with the help of new Internet technologies is largely determined by susceptibility and readiness of region's social environment to changes.

In order to reduce the risk component of implementation of the developed model, related to influence of social factors on this process, it is expedient to supplement it with measures in the sphere of adaptation of region's social environment to future changes in the sphere of implementation of new Internet technologies. For that, the following practice-oriented authors' recommendations are offered:

– establishment of the course at provision of sustainable development of entrepreneurship in the normative and legal provision of entrepreneurial activities in the region;
– implementation of measures in the sphere of social marketing, aimed at informing society and business on critical importance and necessity for sustainable development of regional entrepreneurship and planned methods of achievement of this goal;
– conduct a series of consultations for regional entrepreneurial structures on the issues of their sustainable development, including general theoretical issues of sustainable development of entrepreneurship and applied issues of transition of these structures to sustainable trajectory of development;

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– emphasis on sustainable development of entrepreneurship with state investments into modernization of regional socio-economic system on the basis of new Internet technologies.

Due to achievement of positive transformation changes in the institutional environment of regional socio-economic system and achievement of sustainability of regional entrepreneurship's development, the problems of regional development in modern Russia will be solved for the long-term. Sustainable development of regional entrepreneurship will allow eliminating the existing problems and preventing most new problems of regional development in modern Russia.

Conclusion

Thus, the offered hypothesis was proved. It was substantiated that implementation of new Internet technologies is a perspective means of solving the problems of regional development in modern Russia. These problems concern the non-optimality of interaction between non-government economic subjects (society and entrepreneurship), which leads to low business activity, complexity of employment, unemployment rate, and low level of income, as well as non-optimality of interaction between non-government economic subjects and the state, which leads to inaccessibility and low quality of state services and public benefits, including healthcare, housing and utility sector, infrastructure, etc.

Implementation of new Internet technologies into entrepreneurship allows reducing its capital intensity, increasing business activity, simplifying the process of employment, and increasing accessibility (reducing the cost) of goods and services for population. Due to implementing new Internet technologies into activities of state organizations that provide state services and public benefits, their better controllability and manageability by society are achieved, which stimulates the increase of quality and accessibility.

The central link of the developed and presented authors' model of solving the problems of regional development in modern Russia with the help of new Internet technologies is sustainability of entrepreneurship. Unifying all existing problems of regional development in modern Russia, unsustainable entrepreneurship is the key institutional contradiction of regional socio-economic system. Implementation of new Internet technologies allows overcoming this contradiction, forming favorable institutional environment for establishment of sustainable entrepreneurship and ensuring formation of the institute of sustainable entrepreneurship in modern Russia's regions.

It should be noted that results of the performed research are limited by reflection of perspectives of solving the problems of regional development in modern Russia with the help of new Internet technologies, while the measures that are required for their practical implementation go beyond the limits of this work. These measures include creation and development of the corresponding normative & legal and institutional provision and determine the perspectives of further scientific research.

The determined institutional nature of the problem of regional development in modern Russia emphasizes priority of study of the institutional aspect of solving these problems with the help of new Internet technologies. These problems are related to functioning of institutional provision of sustainable development of entrepreneurship in the region and establishment of the institute of sustainable development of entrepreneurship in region. That's why during further scientific research in continuation of this article it is expedient to include the tools of the neo-institutional economic theory into the methodology.

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ECONOMIC DEVELOPMENT OF COMMUNITY BY ENTREPRENEURSHIP: AN INVESTIGATION OF THE ENTREPRENEURIAL INTENT AND THE INSTITUTIONAL SUPPORT TO THE LOCAL COMMUNITY IN AL-KHARJ REGION*

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Abstract. The purpose of the present study is twofold, to investigate the entrepreneurial intent of the university students and to chalk out with the factors (educational) to be considered for institutional support by the university under study. The Theory of Planned Behavior (TPB) questionnaire was adopted and administered along with a separate sixteen items sheet containng the items pertaining to the institutional suppot mechanisms. Overall, 370 responses were collected from both male & female students. The Data was analysed by applying correlations, linear and hierarchical regression and exploratory factor analysis (EFA). The results of the study reaffirm the theory of planned behaviour in Saudi context with a significant variance of 43.2 percent in explaining students' entrepreneurial intent. However, in the present case it is found that both attitude and perceived behavioral control are the significant predictors of entrepreneurial intent. Moreover, the subjective norm did not significantly predict the entrepreneurial intent. The findings also suggest a four steps generic model of institutional educational support for entrepreneurial nurturement to the local community.

Keywords: Entrepreneurial intent; Theory of Planned behaviour; Economic Development; Institutional Support; Al-Kharj region

Reference to this paper should be made as follows: 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)

JEL Classifications: L26, O10, C20

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1. Introduction

The effect of entrepreneurship on unemployment reduction, income generation and economic prosperity is observed and examined by many studies like Birch (1983), McMullan and Long (1987), Thurik (2003) and Baptista and Thurik (2007), etc. There is a consensus among management practitioners and researchers that successful new ventures are the contributing factors to employment that leads to political and social stability, innovation and competition (Khan, 2013). Undoubtedly, entrepreneurship is something that has to be nurtured within the country itself. In this context it is noticed that educational institutions play a vital role in providing trained workforce; new knowledge creation; support to the existing research and innovation; knowledge transfer; attractor of new talent etc. (Gertler & Vinodrai, 2005; Kirby, 2006). Universities are not only considered as the producers and disseminators of new knowledge (Guerrero & Urbano, 2012) but they are also instrumental in regional, economic and social development (Bygrave & Minniti, 2000; Kirby et al., 2011). In the present knowledge economy, universities are more focused towards promoting the entrepreneurial culture among the community and industries as a whole (Abreu et al., 2016; Kirby et al., 2011). There is evidence worldwide where a significant relationship between the support provided by universities and the level of entrepreneurial activities can be cited easily (Coduras et al., 2008). A University could be primarily a dedicated entrepreneurial university, oriented towards innovation and entrepreneurial culture (Kirby, 2006) or it can be a simply an educational institution with a distinct vision and mission (other than entrepreneurship) but also having some inclination towards entrepreneurship.

The second type of institution is the focal point in the present study. Up to what extent and how a primarily teaching and secondarily research focused regional university can contribute and support in the entrepreneurial development of the local community. The present study has a twofold aim: (1) to measure the level of entrepreneurial intent among the selected and targeted community. i.e. confined to Al-Kharj region of Saudi Arabia; (2) to investigate and suggest the supportive measures required to uplift or nourish the entrepreneurial culture among the community as a whole.

2. Review of Existing literature on Entrepreneurial intent and hypothesis setting

Successful entrepreneurship is considered as an offshoot of entrepreneurial intent. According to Bird (1988), "entrepreneurial intention refers to the individual state of mind that aimed at creating new ventures, developing a new business concept or creating new value within existing firm". Researchers show that intentions can be cultivated and inspired by providing the educational and other kinds of support needed for successful entrepreneurial activities (Matlay, 2008; Støren, 2014). Studies like Engle et al. (2011) suggests that institutional supports in a variety of ways is much desirable and needed to influence and nourish the entrepreneurial intent and for the successful development of entrepreneurship. Though explaining human behaviour in all its complexity is a difficult task (Ajzen, 1991). The theory of planned behaviour has been proven to predict the behaviour by utilising its antecedent. Intention to perform behaviour of different kinds can be predicted with high accuracy from attitudes, subjective norms and perceived behavioural control (Ajzen, 1991; Ajzen, 2002). Intentions are assumed to capture the motivational factors that influence the behaviour. Intentions reflect the level of efforts of individuals to perform a particular behaviour. The three constructs namely, attitude toward the behaviour, subjective norm, and perception of behavioural control mentioned by Ajzen are the core of TPB. While combining these three constructs will lead to the formation of a behavioural intention (Ajzen, 2002).

One of the constructs out of the three independent constructs is the attitude towards a particular behaviour. Attitude is termed as the favourable or unfavourable appraisal of the conduct in question (Ajzen & Fishbein, 2005). It is because the attitude can be positive or negative towards some events or the things. While attitude was

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tested in the context of entrepreneurial intent or behaviour, it is found to be positive in the cross country studies (Iakovleva et al., 2011; Nabi et al., 2011). Attitude is one' personal construct belong to personality while Subjective norm is a social construct refers to the social pressure. Subjective norm refers to the perceived social behaviour to perform or not to perform the behaviour (Ajzen, 1991). People are likely to engage in entrepreneurship when their socially build environment is favourable specifically the people surrounding them (Liñán, 2008; Radwan, Sakr, 2017). Subjective norms found to be a significant predictor of entrepreneurial intent in numerous studies like Kolvereid (1996); Krueger et al. (2000); Schwarz et al. (2009); van Gelderen et al. (2008); Schlaegel and Koenig (2014), etc. The third construct that constitutes the intention is the degree to the perceived behavioural control. It refers to the perceived ease or difficulty of performing the behaviour (Ajzen, 1991). The level of PBC depends upon the self-confidence to do the specific behaviour and availability of resources needed or assisting in performing the behaviour (Ajzen, 1991; Liñán & Chen, 2006; van Gelderen et al., 2008). As a rule of thumb as mentioned in the TPB (Ajzen, 1991) that "the more favourable the attitude and subjective norm concerning a behaviour, and the greater the perceived behavioural control, the stronger should be an individual's intention to perform the behaviour under consideration." Theory of planned behaviour has been applied successfully in different context and culture. In Saudi Context also it has been implemented by very few researchers only, and that too also rendered the mixed results. Table-1 provides the summary of studies conducted in Saudi context, specifically applying the TPB.

Thus the present study is significant in two ways (i) to reaffirm the results of earlier studies on TPB by taking a different sample base. (ii) to Come up with the mechanism of institutional support to nurture the antecedents of TPB which seems to be predicting the behavior of Saudi students.

Table 1. Summary of Existing literature of Theory of Planned Behavior (TPB) in Saudi Arabia

S.N.	Authors	Approach	Sample	Tools Used	Major Findings
1	Aloulou (2016)	TPB	177 undergraduate students of a public University	Multiple, Linear and Hierarchical Regression	Overall the antecedent of TPB significantly explain 33.4% of the variance in students Intention. SN has a stronger influence than other antecedents on the intention.
2	Ali (2016)	TPB	283 final year business students of a public University	Hierarchical Multiple Regression	All the antecedents of EI Significantly explain 40% of the variance in EI. Attitude Explain the highest Variance, i.e. 33.8 followed by PBC 32% and SN explained the least, i.e. 8.5%.

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3	Almobaireek and Manolova (2012)	TPB	950 undergraduate Saudi male and female students	Nested logistic regression model	Attitude and PBC found the association with EI, however, there was no significant association between the perceived social norm and EI. PBC is the most consistent predictor of EI. Attitude Explain the EI strongly. While SN has the lowest among others.
4	(Iqbal et al., 2012)	TPB	292 randomly selected students from a private University	Multiple Regression	TPB is significant and explains the 65% variation among its antecedent. Other Variables are related, but SN has the lowest significance.

Source: Researcher's compilations

Hypothesis Setting:

To test the TPB among the sample of Saudi students, the following hypothesis can be stated

H_1: The entrepreneurial antecedents of TPB positively influence the Entrepreneurial intent of students.
H_{1a}: The perceived attitude to perform the entrepreneurship positively influence the Entrepreneurial intent of students.
H_{1b}: The perceived Subjective Norm positively influences the Entrepreneurial intent of students.
H_{1c}: The perceived behavioural control positively affect the Entrepreneurial intent of students.

Perceived behavioral attitude is considered a good predictor of entrepreneurial intent in Arab Context. Studies like, Aloulou (2016); Khalifa and Dhiaf (2016); Almobaireek and Manolova (2012); Majumdar and Varadarajan (2013) etc. found that attitude significantly and constatntly predict the entrepreenurial intent of Arab students. Therefore, A possiblity of attitudinal impact on ther antecedents of TPB can not be overlooked. Thus, the second hypothesis can be stated as:

H_2: The Perceived attitude to perform entrepreneurship positively influence other antecedent of TPB.
H_{2a}: The perceived attitude to perform entrepreneurship positively influence the Subjective norm.
H_{2b}: The perceived attitude to perform entrepreneurship positively influence the perceived behavioural control of students.

Researchers like, Mustafa et al. (2016); Aloulou (2016); Turker and Sonmez Selcuk (2009) etc. have taken the demographic variable as the control variable to the entrepreneurial intent. We have also used the four different variables (gener, age, educational background and family business background) as control variables to regress over the entrepreneurial intent. Thus, the third hypothesis can be stated as:

H_3: The Demographic Variables like Gender, age, educational background and family business background positively influence the Entrepreneurial intent of students.

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3. Methodology

The study is based on the primary data collected by administering the survey instrument adopted from (Liñán & Chen, 2009) for entrepreneurial intent antecedents and institutional support or educational support variables from (Saleh & Salhieh, 2014). The questionnaire was translated into Arabic language and administered in Arabic. The population selected for the survey was business students who were in level five and above (Bachelor of Science in Business Administration (BSBA) program has total eight levels) of Prince Sattam bin Abdulaziz University registered in different campuses. Notably, our focus here is not about the antiquities of an entrepreneurial research university but to explore the dimension of support by a newly established public university to the local community to support and promote their entrepreneurial intentions. Moreover, ultimately helping them to transform into the entrepreneurial behaviour. Here, we try to investigate the perception of the local community about the perceived support from a newly established university, has a vision of community services/partnership and which is primarily a teaching based university.

The questionnaire was administered for about 500 students in paper and pencil form. 370 responses were collected from both male & female students. This overall constitute the effective rate of 74 percent. An intensive care was taken to validate the data for analysis. Missing values were checked before the final analysis. The major missing responses were eradicated while the responses with less missing frequencies were replaced with the series mean. The Outliers were detected with interquartile range (IQR) and box plotting using SPSS. The identified outlier was totally removed from the data. By this way, the total number of usable items for final analysis were 304. Table-2 below presents the characteristics of the sample used in the study.

Table 2. Characterstics of Samples

Data Type	Questionnaire administered data
Population	Level 5 and Above Business Undergraduate Students
Sample Size	370
Response Rate	74 percent
Final Data for Analysis	304
Male Respondents	214
Female Respondents	90

Table-3 provides the snapshot of the demographic characteristics of the population. The Cronbach's alpha for all the items of TPB was calculated together, i.e. 0.767 which is above than the reliability threshold.

Table 3. Demographic and other characteristics of Population

Demographic and other Background Variables	Data classification- Frequency (*n)* & Percentage (%)
Gender	Male = 214 (70%), Female = 90 (30%).
Age Group	Below 20 Years = 24 (7.9%); 21-24 Years = 257 (84.5%); 25 years and above = 23 (7.6%).
Specialization	Accounting = 85 (28%); Finance = 59 (19.4%); HRM = 108 (35.5%); MIS 52 (17.1%).
Family Business Background	Yes = 155 (51%); No = 149 (49%).

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4. Results and Discussions

The Table-4 explains the descriptive statistics of the TPB antecedents. Where the mean score for E_Intent is 5.988 (M= 5.988, SD =.988), the other antecedent has a mean ATTD *(M= 5.896, SD =.823)*, S_Norm *((M= 5.279, SD =1.049)*, PBC *(M= 4.921, SD =1.260)* respectively.

Table 4. Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
E_Intent	304	2.75	7.00	5.9885	.98873	-.908	.140	.044	.279
ATTD	304	3.00	7.00	5.8967	.82325	-.726	.140	.247	.279
S_Norm	304	1.50	7.00	5.2796	1.04949	-.330	.140	-.221	.279
PBC	304	1.33	7.00	4.9216	1.26081	-.412	.140	-.323	.279
Valid N (listwise)	304								

Table 5. Correlation Matrix

Spearman's rho	1	2	3	4	5	6	7	8	9
1- E_Intent	1.000								
2- ATTD	.617**	1.000							
	.000								
3- S_Norm	.390**	.382**	1.000						
	.000	.000							
4- PBC	.477**	.432**	.523**	1.000					
	.000	.000	.000						
5- GENDER	-.060	-.070	.067	-.007	1.000				
	.296	.226	.248	.899					
6- AGE GROUP	.037	.059	.042	.053	-.269**	1.000			
	.525	.308	.466	.354	.000				
7- COURSE CURRENTLY PURSUING	-.107	-.083	.020	-.001	.145*	.002	1.000		
	.063	.146	.734	.985	.011	.976			
8- SPECIALIZATION	-.095	-.057	-.011	-.071	-.197**	.116*	.222**	1.000	
	.098	.318	.845	.216	.001	.043	.000		
9- FAMILY BUSINESS BACKGROUND	-.140*	-.143*	-.082	-.126*	-.160**	.008	.021	.075	1.000
	.015	.013	.153	.028	.005	.887	.719	.192	
**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).									

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Before delving into the regression analysis, a spearman correlation among all the variables was selected in order to carry out the study. The Entrepreneurial intent (E_intent) was found that it has a statistically significant correlation with the perceived attitude towards behaviour (ATTD), Perceived subjective norm (S_Norm) and Perceived Behavioural control (PBC). There was no significant difference of entrepreneurial intent and its antecedent regarding gender (male/female) was cited. On the other hand, those with a family business background have a significant amount of correlation with entrepreneurial intent, and its antecedent. Table-5 above explains the results of correlations in details.

A multiple linear regression was carried out to know the predictability of TPB (entrepreneurial intent and its' antecedent) in the Saudi context. It was found to be significant with a regression equation ($F(3, 300) = 76.118$, $p < .000$), with an R^2 of .432 and $R^2_{Adjusted}$ = .427. Respondents' predicted Entrepreneurial Intent is equal to 1.310 – .583 + .073 +.174, where all the Independent Variables (IVs) are measured on a seven-point Likert scale. It was found that both attitude and perceived behavioural control are the significant predictors of entrepreneurial intent. However, the subjective norm did not significantly predict the entrepreneurial intent ($_{\beta}$=.077, t(303) = 1.493, ns). The collinearity statistics show no evidence of multicollinearity as measured by Variance Inflation Factor (VIF). The tests indicated a very low level of multicollinearity, (*VIF = 1.327, ATTD; 1.413 for S_Norm and 1.423 for PBC*). The VIF in all the cases is >1 but less than 2.

Though there is no formal VIF value for determining the presence of multicollinearity but the lesser value of VIF not exceeding ten is considered as safe. Thus, the results discussed below in Table-6 support the hypothesis ***H*$_1$**, ***H*$_{1a}$**, *and* ***H*$_{1c}$**. However, hypothesis ***H*$_{1b}$** did not find any support for acceptance.

Table 6. Regression Results for Hypothesis 1

DV- *E_Intent*	**STd. $_{\beta}$**
IV:	
1. ATTD	.486**
2. S_Norm	.077ns
3. PBC	.222**
R	.657a
R^2	0.432
Adjusted R^2	0.426
ΔR^2	.432
F	76.118
Δ F	76.118
Significance of F	0.000**
Targeted Hypotheses	H_{1a} - H_{1c}
Notes: n=304. **Significant at 0.01 level (*p< 0.01)*	
Annotations: *DV= Dependent Variable, IV= Independent Varible, E_Intent= Entrepreneurial Intent, ATTD= Attitude Towards the behavior, S_Norm= Subjective Norm, PBC= Perceived Behavioral Control.*	

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To test our second hypotheses, a multiple linear regression test was carried out separately for the antecedents, where SN has been taken as the dependent variable. When ATTD is taken as IV the significant regression equation emerged as (F(1, 302) = 66.309, *p < 0.000),* with an R^2 *of 0.180 and* $R^2_{Adjusted}$ *= 0.177* (Table 7).

Moreover, the another regression equation, when PBC was taken as an *IV* emerged as (F(1, 302) = 69.132, *p < 0.000), with an* R^2 *of 0.186 and* $R^2_{Adjusted}$ *= 0.183* indicating that attitude is significantly impacting equally (with minor, negligible difference) with the other antecedents of TPB. (Table 8).

Table 7. Regression Results for Hypothesis 2

	DV- SN STd. $_{\beta}$	***DV- PBC STd.*** $_{\beta}$
IV: *ATTD*	.541**	.661**
R	.424	.432
R^2	0.180	0.186
Adjusted R^2	0.177	0.184
ΔR^2	0.180	0.186
F	66.308	69.132
Δ F	66.308	69.132
Significance of F	0.000	0.000
Targeted Hypotheses	H_{2a}	H_{2b}
Notes: n=304. **Significant at 0.01 level (*p< 0.01), ns= Not Significant*		
Annotations: *DV= Dependent Variable, IV= Independent Varible, ATTD= Attitude Towards the behavior, S_Norm= Subjective Norm, PBC= Perceived Behavioral Control.*		

Thus, the results discussed above provide the support for the hypotheses (H_2, H_{2a} and H_{2b})

To test the hypothesis that *the demographic variables like gender, age, educational background and family business background positively influence the entrepreneurial intent of students;* a hierarchical multiple regression analysis was performed. As a first step regression on TPB antecedents were carried out. The antecedents have also repeated the same trend here and were still found to be statistically significant, where ATTD ($_{\beta}$ = .486; t = 9.688; p <.001), S_Norm ($_{\beta}$ = .077; t = 1.493; p= 1.493 ns), PBC ($_{\beta}$ = .222; t = 4.270; p <.001). At the time of combining these variables with the demographic variables as a second step the model fit has increased (*R = .444,* R^2 = .429, F (8, 295) = 29.425, p < .001) that means addition of the demographic variables improve the prediction of the model. However, the individual coefficients of the demographic variables are found to be insignificant.

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Table 8. Regression Results for Hypothesis 3

DV- *E_Intent*				
	B	***SE b***	***Std.* $_{\beta}$ *(Step 1)***	***Std.* $_{\beta}$ *(Step 2)***
STEP 1				
Constant	1.310	.325	-	-
ATTD	.583	.060	.486**	-
S_Norm	.073	.049	.077ns	-
PBC	.174	.041	.222**	-
STEP 2				
Constant	2.010	.496	-	-
ATTD	.561	.061	-	.467**
S_NORM	.081	.049	-	.086ns
PBC	.171	.041		.218**
Gender	-.069	.103	-	-.032ns
Age Group	-.039	.114	-	-.016ns
Course currently pursuing	-.153	.114	-	-.061ns
Specialization	-.056	.042	-	-.060ns
Family business background	-.088	.088	-	-.045ns
R	-	-	.657	.666
R^2	-	-	0.432	0.443
Adjusted R^2	-	-	0.426	0.428
ΔR^2	-	-	0.432	0.011
F	-	-	76.117	1.232
Δ F	-	-	76.117	1.232
Significance of F	-	-	0.000	0.294
Targetted Hyotheses	*H3*			

Notes: n=304. **Significant at 0.01 level (*p< 0.01), ns= Not Significant,*
Annotations: *DV= Dependent Variable, IV= Independent Varible, E_Intent= Entrepreneurial Intent, ATTD= Attitude Towards the behavior, S_Norm= Subjective Norm, PBC= Perceived Behavioral Control.*

In this section, an attempt has been made to investigate and identify the factors that can be fruitful to streamline the institutional support from the education perspectives. To collect the student's perspectives from an educational point of view, a sixteen items questionnaire adopted from Saleh and Salhieh (2014) was administered as an integral component of the TPB questionnaire on a seven-point likert scale. A total of 304 questionnaires were used for the analysis. However, before executing the factor analysis, an intensive care was taken to validate the data reliability. High volume missing values were eradicated, and low-level missing values were replaced with series mean. The Cronbach's alpha for these items were calculated separately, i.e. 0.961 which is highly reliable.

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Outliers were detected with interquartile range (IQR) and box plotting using SPSS. The identified outliers were removed from the data. By this way, the total number of usable items for factor analysis was 304.

Before proceeding with the exploratory factor analysis (EFA) sampling adequacy was checked with Kaiser-Meyer-Ohlin (KMO) and sphericity with Barlett's test. The KMO was found to be 0.948, indicating that data is highly sufficient and justified for the EFA. The sphericity test is also found to be significant.

As a second step, exploratory factor analysis (EFA) using Principal Axis Factoring and Non-Orthogonal Promax rotation with Kaiser Normalization (Eigenvalues ≥ 1) was conducted. In total four factors were extracted, combining explained a total of 73.27 percent of Variation. The items with a threshold limit of ≤ .45 were eliminated. The results of EFA and pattern matrix are in the form of Table-9.

Table 9. Pattern Matrix

	Factors			
	1	2	3	4
Education Q1	.225	-.084	.656	.033
Education Q2	-.096	-.006	1.043	.005
Education Q3	.169	.069	.690	.003
Education Q6	.804	-.131	.153	-.028
Education Q7	.824	.175	.001	-.119
Education Q8	.825	.078	-.036	-.028
Education Q9	.789	-.124	.065	.091
Education Q10	.573	.180	.029	.122
Education Q11	.594	.148	-.002	.162
Education Q12	-.027	.051	-.030	.854
Education Q13	.099	.060	.102	.691
Education Q14	.063	.777	-.013	.098
Education Q15	-.051	.728	-.010	.192
Education Q16	-.020	.970	-.022	-.099
Education Q4	.147	.455	.366	-.074
Extraction Method: Principal Axis Factoring. **Rotation Method:** Promax with Kaiser Normalization.				
a. Rotation converged in 7 iterations.				

After careful deliberations, the factors emerged through EFA can be streamlined in the form of a four-step model in which the factor one which constitutes variables from 1-3 can be named as *Germination of Entrepreneurship*. The germination can be possible by providing entrepreneurial centric educational support by offering courses focused on inculcating the entrepreneurial ability and start up capacity.

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Factor two consists the variables from 6-11; can be termed as *Cultivation of entrepreneurial skills* which are necessary for a successful entrepreneur by creating a culture of entrepreneurship and by offering flexible, need base and real time curriculum.

Factor three consists the variables 11&12 are named as *blooming*. Blooming of entrepreneurial culture can be possible by creation of entrepreneurial awareness to enhance the entrepreneurial career launching. The next factor four consists of variables 14 to 16 and variable 4 can be named as *Harvesting* which is the combined results of the above three steps/factors that can be possible by creating networking opportunities for startup funding.

This proposed generic model reflected in Figure-1 below can be taken as a support mechanism of entrepreneurship development among the local community by the Prince Sattam bin Abdulaziz University.

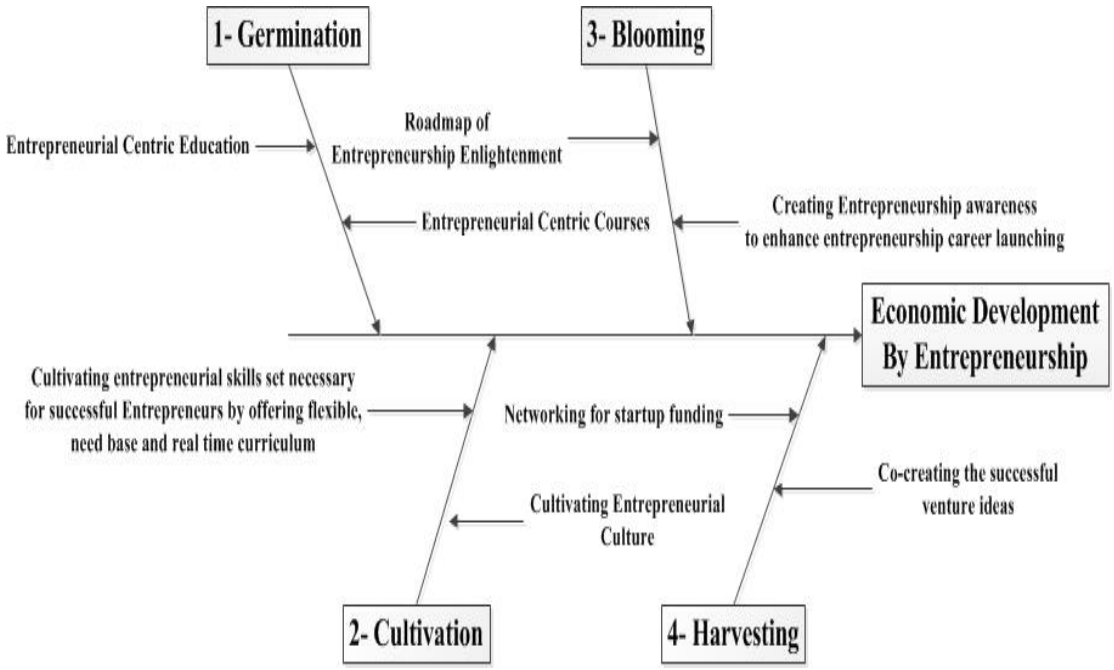


Fig.1. Generic Model of institutional support to the Local Community for entrepreneurship development

Source: Researcher's compilation

5. Conclusion, suggestions and limitations

The present research indicates the wider acceptability of TPB in predicting the entrepreneurial intent world-wide. The purpose of the study was twofold, (i) to investigate the entrepreneurial intent of the university students, under consideration, (ii) to chalk out the factors (educational) to be considered for institutional support by the university under study. The results provide the sufficient evidence that antecedents of TPB except subjective norm contribute significantly towards predicting the entrepreneurial intent of Saudi students. Thus our results show consistency with Ali (2016); Almobaireek and Manolova (2012) and (Iqbal et al., 2012) who found subjective norm to be the insignificant predictor of the entrepreneurial intent of Saudi students. Surprisingly these results

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contradict with Aloulou (2016) who found subjective norm to be the strong predictor of the intent of Saudi students.

Therefore, the findings support the previous research on TPB which reflects the importance of this model worldwide (Engle et al., 2010; Kautonen et al., 2015; Lüthje & Franke, 2003; Shook & Bratianu, 2010; van Gelderen et al., 2008). The findings match with the findings of Krueger et al. (2000) and (Autio et al., 2001) who found Attitude and PBC as the significant and vigorous predictor of EI but not the Subjective norm. The Demographic variables (such as gender, age, family business background, etc.) taken together along with TPB also do not seem to pose a significant impact over the antecedent of TPB but improve the prediction power of the model.

The prior application of TPB in Saudi context suggested that attitude, subjective norm and perceived behavioural control when taken together explain 33.4 percent variance in Aloulou (2016) and 40 percent in Ali (2016). However, in the present study it shows 43.2 percent.

The second section of the paper that carried out the factor analysis emerged with four important factors from a population source that do not have any specific & formal kind of entrepreneurial education but have a bent of mind and more importantly a positive attitude towards starting new ventures and interested in playing an entrepreneurial role in future. The factors extracted by the exploratory factor analysis are emerged into a four-step generic model that can be set into the Germination of entrepreneurial seed, Cultivating entrepreneurial culture, Blooming of entrepreneurial mind and Harvesting of entrepreneurs' initiative. Saudi Arabia is the biggest market in GCC. Therefore, Universities are encouraged to have formal agreements/partnerships with the startups and new ventures facilitation centers.

Likely others one of the limitations of the study can be pointed that the results cannot be generalised as the study is particularly focussed on one region and universities of Saudi Arabia. Another limitation can be that the sample was analysed by applying only the linear approach of regression; a second generation structural approach can get more reliable and robust results.

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EVALUATION OF INVESTMENT PROJECTS UNDER UNCERTAINTY: MULTI-CRITERIA APPROACH USING INTERVAL DATA

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Abstract. Multi-criteria decision making (MCDM) methods have evolved for various types of applications. In the past, even small variations to existing methods have led to the creation of new avenues for research. Thus, in this study, we review the MCDM methods in investment management and examine the advantages and disadvantages of these methods in a risk environment. In addition, we study the effectiveness of investment projects using these methods. The analysis of MCDM methods performed in this study provides a guide for the use of these methods, especially the ones based on interval data, in investment project analysis. Furthermore, we propose a combination of multi-criterial selection and interval preferences to evaluate investment projects. Our method improves on the method of calculating economic efficiency based on a one-dimensional criterion and sensitivity analysis, though our proposal involves complicated calculations.

Keywords: multicriterial approach, risk management, Pareto set, investment project, interval data, investment project evaluation

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JEL Classifications: M21, O16, O22

1. Introduction

Investment analysis is a commonly performed step before the development or introduction of new, more advanced forms or methods of management into broad practice. The quality of the decisions made is determined, essentially, by the selected alternatives based on the analyses. In making economic decisions, the important steps include (i) the creation of an indicator system, including decision criteria, and (ii) analysis and prediction of the occurrence of the problem for the subsequent generation and selection of alternatives

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(Lukicheva and Egorychev, 2016). The quality of the decisions made is essentially determined by the alternative selected based on the analyses.

Multi-criteria decision-making (MCDM) methods are types of Operations Research tools that can be used to solve complex problems with high uncertainty, conflicting objectives, different forms of data and information, and multiple interests and perspectives, and can account for complex and evolving biophysical and socio-economic systems (Wang et al., 2009).

Several attempts have been made to develop Multi-Criteria Approach (MCA) methods that retain the strengths of the Analytic Hierarchy Process (AHP) while addressing some of the weaknesses; for example, MCA method can be considered as a complete aggregation method of the additive type. The problem with such an aggregation is that we obtain the same result with a different ordering by different indicators, in which case, we lose some information. Detailed, and often important, information can be lost by such an aggregation. Our efforts have been focused largely on finding different methods of eliciting and then synthesizing pairwise comparisons. However, it is beyond the scope of this manuscript to discuss these developments in detail. The best-known alternative to the AHP is the Rembrandt system (Beinat and Nijkamp, 1998).

The Rembrandt system is a direct rating system, which is based on a logarithmic scale; it transforms the AHP scale of range 1–9 by including the eigenvector-based synthesis approach instead of the geometric approach, and thus, can be used to estimate weights and scores from pairwise comparison matrices (Olson, 1995).

Investment decisions directly depend on the effectiveness of the comparative evaluation of the alternatives considered; therefore, in the case of strategic decisions, it is important to consider the effectiveness of such a comparative evaluation, because investment decisions involve a considerable amount of resources.

Owing to multilateral nature of economic activities, they cannot be expressed by a one-dimensional index; thus, MCDM is important for investment analysis. In particular, an MCDM framework is suitable for multi-dimensional economic activities, because it considers all factors involved in reducing risk while evaluating investment in projects. These abovementioned and other advantages explain the growing interest in multidimensional methods for analysis and evaluation of economic decisions (Brigham and Ehrhardt, 2015).

All enterprises are to some extent engaged in investment activities; furthermore, decision-making related to such investment activities involves various complicated factors, including limited financial resources, type of investment, and possible losses that the enterprise may incur if the project is less profitable later or fails entirely due to unforeseen circumstances (Jelnova, 2013; Minakova and Anikanov, 2013). Thus, risk management allows confirming the viability of solutions for a project and reducing the likelihood of adopting an inefficient or unprofitable project.

In light of the discussion thus far, we consider the following research questions (RQs) in our study:
RQ1: What are the benefits of implementing multi-criterial approaches for the evaluation of investment projects considering uncertainty?
RQ2: What are the limitations of implementing multi-criterial approaches for the evaluation of investment projects?
Thus, considering these research questions, the following points describe the significance of this research:
(i) The use of interval preferences in this research allows experts to express their opinions in a simpler yet more accurate manner; in addition, uncertainty is considered without using any kind of statistical data.

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(ii) The use of a multi-criteria selection procedure set (Pareto approach: Graph Core) allows different criteria to be evaluated on different scales; this reflects the different aspects of the measured phenomena (particularly, effectiveness of the investment project).
(iii) The set of indicators can involve other real-world factors aside from those part of the projects' environments.

The remainder of this paper is organized as follows. The theoretical framework is discussed in Section 2, which presents a background of approaches that are used to assess performance considering various criteria and risk conditions. In Section 3, our proposed method to select the optimal investment project in a risk environment based on the Pareto model is described. Section 4 presents the results and discussion, wherein model calculations demonstrating the capabilities of our method and the use of other performance indicators with our method are discussed; in addition, possible future directions for research are introduced. Finally, Section 5 presents our conclusion summarizing the advantages and limitations of our proposed methodology.

2. Background

2.1. Modern approaches for evaluation of investment projects

There are several modern approaches for investment evaluation; some of these are introduced in the following lines:
(i) Cost Benefit Analysis (CBA): CBA is the most widely used evaluation technique for assessing infrastructural investments worldwide. CBA is based on monetization and inter-temporal discount. In this case, money is the measuring unit used to represent all costs and benefits associated with an investment or policy (Zare et al., 2016).
(ii) Hexagon Model: This model focuses on the integrated vision of sustainability; it is based on four different types of strongly interconnected capital (government, customer, bank, professional organizations) (Mardani et al., 2015).
(iii) Analytic Hierarchy Process (AHP): This process consists of decomposing a complex decision-making process into a hierarchical structure (Saaty, 1990).
(iv) Lexicographical Method: In this method, we formulate the general lexicographical principle and then use it for various selection procedures (Tarp, 2014).
(v) Pareto Approach: This approach is used to solve multi-criteria selection problems or find the optimal solution among a set of alternatives using automated decision support systems; in particular, it selects the Pareto set from the original set of alternatives (Grierson, 2008).
(vi) Life Cycle Analysis (LCA): This is forecasting tool used by individuals or enterprises in industrial fields. The LCA analysts are interested in forecasting future materials/costs on a regional or global scale as a function of differences in economic growth and regulatory scenarios.

These abovementioned approaches can reflect the nature or consequences of investments in a business organization.

The Pareto approach is used in our study because it includes a large number of economic indicators, which are well known in business, and can be used by managers to compare various investment alternatives (Savchuk, 2007). For example, decision makers should focus more on selecting, sorting, ranking, and describing the investment alternatives in terms of their performance based on various factors, such as the criteria and risk conditions. These factors can be classified into two different groups, namely internal and external; after this, the influence (rank) of each factor can be evaluated. Academic texts most often advice using the following indicators: net present value (NPV), discounted payback period (DPP), and internal rate of return (IRR) (Mazur et al., 2014).

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Based on the value of these indicators, a project can be accepted or rejected or the best alternative from several options can be selected. Nevertheless, these indicators describe the effectiveness of the project being analyzed from different perspectives; therefore, it is necessary to construct a multidimensional criterion (Keshavarz Ghorabaee et al., 2015).

In particular, to calculate DPP, we focus on both the primary methods available in literature; these are discussed as follows:
(i) The first approach involves calculating DPP from the capital owner's perspective. Thus, the payback period is calculated as the period for which the owner receives a profit equal to the amount of invested capital; this suggests that the project in consideration at least leads to the conditions of simple reproduction, considering the presence of a time factor.
(ii) The second approach involves calculating the DPP from the business manager's perspective, for which the amount of NPP is important. Thus, in this case, the payback period is determined as the time in which a net discounted income that compensates the amount invested in the project capital is obtained (Seitz and Ellison, 1999).

However, the comparison of different projects based on these indicators can lead to differences in the order of effective projects, especially considering the dynamics of various factors that affect the effectiveness of projects. The NPV index provides an overview of the effectiveness of the company's management. Considering this, it is advisable to use the DPP indicator calculated based on the amount of received profit for the formation of a multidimensional criterion.

Furthermore, based on the IRR index, it is possible to obtain an ordering of suitable projects different from that obtained using the NPV index (Stoyanova and Krylova, 2006; Syroezhin, 1980). However, the IRR index is specific and reflects the efficiency of capital investments; therefore, this advantage of IRR is also its major limitation, because it uses a single discount rate to evaluate every investment.

In particular, IRR measures the effectiveness of capital investments; thus, this indicator partially allows the comparison between investment projects with different capital investments and terms of implementation. Typical methodological recommendations for calculating the effectiveness of investment projects solve the problem of selecting from alternative projects by using the NPV indicator for risk evaluation. This method is useful for certain cases, such as efficiency comparison within existing external circumstances. This recommendation helps avoid the conflict of interests as regards which indicators to use. We offer to leave them all as they reflect different aspects (e.g., uncertainty, market situation, project capacity, etc.) of the economic system. All of these aspects are important for the criteria's formation in the economic system.

2.2. Multi-criteria approach for evaluation of investment projects

There are four primary reasons that justify the use of MCDM methods; these are listed as follows:
(i) MCDM methods allow the investigation and integration of interests and objectives of multiple actors because both quantitative and qualitative information from every actor is considered in forming the criteria and weight factors (Tsoutos et al., 2009).
(ii) These methods address the complexity of multi-actor setting by providing output information (Hayashi, 2000; Gurumurthy and Kodali, 2013).
(iii) These are well-known and commonly used methods for the assessment of investment alternatives. Moreover, different versions of these methods are developed for specific contexts (Opricovic and Tzeng, 2004).

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(iv) MCDM methods allow for objectivity and inclusiveness of different perceptions and interests of actors (Kangas and Kamgas, 2002).

Because CBA depends on the time at which it is being performed, it is more appropriate as an ex-ante instrument; in contrast, the multi-criteria approach can be adopted both for ex-ante and ex-post assessments (Stoyanova and Krylova, 2006), which is an advantage of the MCA. Considering the dimensions of the project or the policy to be evaluated, the characteristics (evaluative standpoint, decision-relevance, comparability, verifiability, accountability, and scientific progression) of CBA and MCA render the dimensions of the project useful. In particular, on a large scale, i.e., when public and private costs are consistent, the CBA approach is necessary, whereas MCA appears useful at the small-scale, where all the stakeholders can be considered individually, and can be consulted or can express informed opinions on their priorities.

Based on the discussion thus far, it is necessary to use methods for the evaluation of the effectiveness of alternative investment projects that are based on multi-criteria selection. However, the known methods for multi-criteria selection are still not considered in commonly used methods that can solve the problem of selecting the optimal investment solution (Roy, 1976). In particular, the selection of an effective investment project involves the best combination of values based on the analyses of disparate indicators characterizing the investment project.

Another important problem that needs to be acknowledged is that investment projects are generally implemented in a risk environment; this indicates significant environmental uncertainty. Environmental changes can cause a decrease or increase in cash flows during the implementation of particular investment projects. Thus, it is possible that the goals set by an investor might not be achieved, instead the investor might incur losses.

The extent of these losses and their probability characterize the risk that is typical for any type of entrepreneurial activity. Without risk, the evaluation of the alternatives under consideration becomes unrealistic (Orlovsky, 1981; Parrino et al., 2014).

There are two mutually complementary types of project risk analyses, namely quantitative and qualitative risk analyses. In particular, qualitative analysis determines the factors, scope, and types of risk; furthermore, before conducting quantitative analysis, it is necessary to quantify the impact of the identified risks and losses from failure on the project objectives.

In the case of qualitative analysis, the variety of risks associated with investment projects considerably complicates the analysis tasks, including risk classification. In the case of investment projects' evaluation analysis, it seems appropriate to classify the risks based on their origin (Khokhlov, 2011). The calculation of economic efficiency in terms of risk involves identification of risk factors in the classified areas, identification of risk situations, and the correlation of the risk situations with the consequences of implementing the investment project (Rodionova et al., 2013). The flow of risk formation is depicted in Fig. 1.

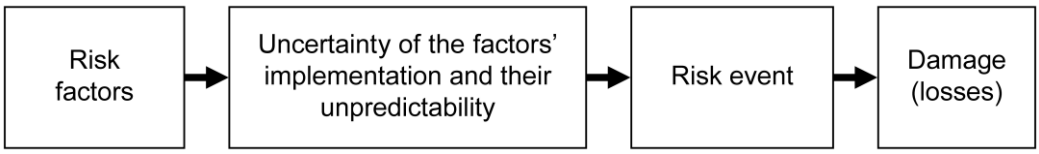


Fig. 1. Formation scheme for risk factors
Source: Rodionova et al., 2013

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In general, risk factors are unplanned events that might cause a deviation from the planned progress of the project; the dynamic interaction of various risk factors affects the effectiveness of the project. In particular, the combination of possible risk factors and the ensuing consequences from them determine the risk situation.

Quantitative risk analysis includes the quantification of not only individual risks, but also risks at the project level, i.e., affecting the entire project; through this analysis, the possible damage is also determined. The most common methods of quantitative risk analysis include statistical analysis, scenario building, expert assessments, analytical methods, and the use of decision trees and simulation modeling (Bukhvalov et al., 2011). Each of these methods has certain disadvantages; however, they can be compensated for using an integrated approach.

Most modern methods used for calculating the effectiveness of investment projects assume a one-dimensional criterion; in these cases, risk situation is determined using a sensitivity assessment procedure, which involves analyzing the changes in project results depending on the dynamics of risk factors. However, different authors suggest different approaches (Rodionova et al., 2013; Bukhvalov et al., 2011). Our proposed approach is based on the use of the multi-criteria selection method. The peculiarity of our proposed approach is the use of multi-criteria selection with an interval estimation of project risk.

3. Proposed method

The complex approach for investment decision making involves calculating the NPV, DPP, and IRR of each alternative being analyzed (Rodionova et al., 2013). In addition, this approach is peculiar because it considers the uncertainty of the external environment. To do so, expert estimates of the likelihood of damage from the implementation of a project and the intervals of fluctuation of the three criteria are used to adjudge the effectiveness of the investment project.

In this study, we further develop this approach and include the risk from multidimensional estimation. It is known that uncertainty presupposes the presence of factors under which the results of actions are not deterministic, and the degree of possible influence of these factors on the results is unknown (Vedernikov and Mogilenko, 2011). Thus, we consider more closely the uncertainty factor and possibility of damage occurrence. Therefore, we include the forecast of the market situation in the future as well as the risk assessment in each of the possible situations. This approach allows us to include a generalized risk indicator, which can reflect, as components, various types of risk. This is depicted in Table 1.

Table 1. Proposed method

1	Investment alternatives are selected
2	A selected criterion for each alternative is evaluated as an interval value
3	Membership Function values for each interval and each criterion are calculated indicating magnitude of risk
4	Interval Preferences are introduced
5	Pareto tuple is constructed based on the selected optimal decision (invested project)

Source: Rodionova et al., 2013

We estimate the ranges of values for all indicators considering the risk involved in alternative investment projects. Intervals are determined both in terms of absolute values of the indicators, and in grades (Rodionova et al., 2013).

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To estimate the effectiveness of alternative options and select the most preferable one based on the built-in interval preference ratio (IPR), here, we use the notation introduced in Ref. 30.

Consider that $I = \{I_\alpha, \alpha = 1...n\}$ is a set of variants of investment projects,
$K_i(I_\alpha) = [A_i(I_\alpha); B_i(I_\alpha)]$ represent the criteria for assessing the effectiveness of each investment project in the interval form,
$i = 1...r$, r is the total number of evaluation criteria, $A_i(I_\alpha)$ and $B_i(I_\alpha)$ are the lower and upper bounds of the evaluation interval, $K(I_\alpha) = \{K_1(I_\alpha), K_2(I_\alpha), ...K_r(I_\alpha)\} = \{[A_1(I_\alpha); B_1(I_\alpha)]$, and $[A_2(I_\alpha); B_2(I_\alpha)]$, $...[A_r(I_\alpha); B_r(I_\alpha)]\}$ is the vector indicator of each investment project's effectiveness.
We introduce the notation II for the set of Pareto-optimal IP ($II \subset I$) with the number of elements $\gamma \le n$ satisfying the dominance condition $II_{m1} > II_{m2} > ...II_{my}$, $m_j = 1...y$. Then, the problem can be formulated as follows to construct the Pareto tuple of considered variants of investment projects, whose elements satisfy one of the conditions

$K_i(I_{yj}) = min[K_i(I_\alpha)]$, $I_{yj} \in II$ or $K_i(I_{yj}) = max[K_i(I_\alpha)]$, $I_{yj} \in II$.

We note that if the exponent is a scalar quantity, it can be represented as a degenerate interval with coincident ends $A_i(I_\alpha) = B_i(I_\alpha)$ (Orlovsky, 1981; Serguieva and Hunter, 2014).

The ambiguity in the selection of the criteria and variety of factors are considered, because of the complexity of the problem of assessing the effectiveness of investment projects. It is necessary to assume that the decision-maker (usually, the project manager) does not have a clear opinion on the preferences for the analyzed alternatives. The representation of indicators using interval values and qualitative difference of the measured quantities, which is expressed as the difference in the units of measurement, make it convenient to compare the variants based on the IPR (Vedernikov and Mogilenko, 2011).

Let m_i be the width of the estimates' interval for the i-th criterion. According to fuzzy methods (Orlovsky, 1981), the interval relation of preference R^u on the set I_α is the set of the Cartesian product $I_k \times I_l$, ($k = 1,...n$, $l = 1,..n$, $k \ne l$). For characteristic of the set of the Cartesian product, we consider the interval membership function $\mu^u K_i(I_k, I_l)$: $I_k \times I_l \to [-1;1]$.

$$\mu^u K_i(I_k, I_l) = m_i^{-1}(K_i(I_k) - K_i(I_l)) \qquad (1)$$

Each value of the membership function $\mu^u K_i(I_k, I_l)$ estimates the degree of gain and damage in recognizing variant I_k as the dominant variant I_l based on the criterion K_i.

The degree of dominance of the alternative I_k over the alternative I_l based on the interval criterion K_i is represented by the membership function $\mu_D{}^u K_i(I_k, P_I)$, which determines the ratio of strict interval preference.

$$\mu_D^u K_i(I_k, I_l) = \mu_u K_i(I_k, I_l) - \mu_u K_i(I_l, I_k) \qquad (2)$$

For comparison, it is important to establish that the alternative I_k is not undermined compared with the I_l alternative, which is determined using the membership function.

$$\mu_{ND} K_i(I_k, I_l) = 1 - x, x \ge 0; x = \mu_D^u(K_i(I_K, I_l) \qquad (3)$$

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Then, for the *i*-th interval criterion, the proximity of the alternative I_k to the Pareto-optimal variant is characterized by the value of the membership function for the set of non-dominant alternatives (Orlovsky, 1981; Vedernikov and Mogilenko, 2011).

$$\mu_D^* K_i(I_k) = \min \mu_{ND} K_i(I_k, I_l) \quad (4)$$

The criterion NPV depends on the amount of cash flows at specific times and the discount rate *r*: (Bukhvalov et al., 2011):

$$NPV = C_1(1+r)^{-t1} + ... + C_n(1+r)^{-tn} \quad (5)$$

As a discount rate, a risk-free interest rate or a rate of interest for projects with the same degree of risk, or the sectoral coefficient of capital investments' efficiency, are typically used. Based on this criterion, a project with a maximum value with the same value of *r* is selected. Because NPV strongly depends on the discount rate, an ungrounded forecast of the discount rate can lead to incorrect management decisions, e.g., a good project might be rejected or an inefficient one might be accepted. Due to the specification of NPV interval values, it is clarified that the optimal condition for the NPV criterion is the maximum value.

Furthermore, DPP is expressed as a time interval; the optimal condition for this criterion corresponds to its minimum value. In addition, the IRR is expressed in percentages and is given as an interval value; for this criterion, a project corresponding to the maximum value is selected (Rodionova E.A., Shvetsova OA. et al).

4. Results and discussion

4.1. Data implication and results

Risk assessment is performed based on interval values in grades. Assuming that the interest rate r is a random variable for which the probability of a random event can be found, $NPV(r, t) > 0$, $P(NPV(r, t) > 0) = P(r < IRR) = F(IRR)$. Here $F(x) = P(r < x)$ is the distribution function of *r*, *IRR* is the internal rate of return, which is obtained as a solution to the equation $NPV(t, r) = 0$. For different *r*, it is possible to establish the probabilities that the project will not pay off at time *t*, and then scores are obtained using the valuation procedure. Here, we conduct the risk evaluation for a project based on the abovementioned methodology for three possible predictable market conditions for which experts estimated the likelihood of implementing each of them. It should be noted that the criterion for assessing the risk of an investment project requires selecting the best option based on the minimum value of the criteria.

Considering the known theoretical representations, the values of m_i are selected as the maximum permissible values for the considered criteria. The initial data required for the investment projects analysis calculations are presented in Table 2.

Table 2. Data implication for different projects

Projects/Indicators	*I1*	*I2*	*I3*	*mi*
$K_1(I\alpha)$-*NPV* (USD)	[50;60]	[70;120]	[80;100]	200
$K_2(I\alpha)$-*DPP* (annual)	[3;8]	[4;6]	[5;9]	10
$K_3(I\alpha)$-*IRR* (%)	[16;17]	[10;20]	[14;18]	30
$K_4(I\alpha)$-risk evaluation (points)-pessimistic forecast	[6;8]	[3;9]	[5;9]	10
$K_5(I\alpha)$-risk evaluation (points)- realistic forecast	[4.5;7]	[5;8.5]	[4;7]	10
$K_6(I\alpha)$-risk evaluation (points)-optimistic forecast	[4;5]	[4;6]	[3;5.5]	10

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Using Eq. (1), we obtain the values of the membership function $\mu^u K_i\ (I_k,I_l)$ for each pair of variants for each criterion and compute their estimated matrices. Thus, Eq. (1) can be expanded as:

$$\mu^u K_i(I_k,I_l) = ([min\{A_i(I_k) - A_i(I_l);B_i(I_k) - B_i(I_l)\};\ max\ \{A_i(I_k) - A_i(I_l);B_i(I_k) - B_i(I_l)\}])/m_i$$

and be denoted by

$$C_i^{kl} = min\{A_i(I_k) - A_i(I_l);\ B_i(I_k) - B_i(I_l)\}/m_i,$$
$$D_i^{kl} = max\{A_i(I_k) - A_i(I_l);B_i(I_k) - B_i(I_l)\}/m_i$$

Then,

$$\mu^u K_i(I_k, I_l) = [C_i^{kl}; D^{kl}{}_i] \qquad (6)$$

Further, the interval membership function for the I_l, I_k takes the following form:

$$\mu^u K_i(I_k, I_l) = [-D_i^{kl}; -C_i^{kl}] \qquad (7)$$

Hence, if relation $|C^{kl}{}_i| = D^{kl}{}_i$ is true, then the values $\mu^u K_i\ (I_l,I_k)$ $\mu^u K_i\ (I_k,I_l)$ coincide as well.

Using Eq. (2), we include the preference intensity for each pair of variants for each criterion through the values of the membership function $\mu_D{}^u K_i\ (I_k,I_l)$ and include them in the estimated matrices. Using Eqs. (6) and (7), we simplify the calculations.

Thus, we evidently have

$$\mu_D{}^u K_i\ (I_k,I_l) = [C_i^{kl};\ D_i^{kl}] - [-\ D_i^{kl}\ ;\ -\ C_i^{kl}] = [C_i^{kl} + D_i^{kl};\ C_i^{kl} + D_i^{kl}]$$

Thus,

$\mu_D{}^u K_1(I\alpha)$ =

-	−0.4	−0.35
0.4	-	0.05
0.35	−0.05	-

$\mu^D{}_u K_2(I\alpha)$ =

-	−0.1	−0.3
−0.1	-	−0.4
0.3	0.4	-

$\mu^D{}_u K_3(I\alpha)$ =

-	0.1	0.03
−0.1	-	−0.06
−0.03	−0.06	-

$\mu^D{}_u K_4(I\alpha)$ =

-	0.2	0
−0.2	-	−0.2
0	0.2	-

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$\mu^{D}{}_{u}K_5(I\alpha)$ =

-	−0.2	0.05
0.2	-	0.25
−0.05	−0.25	-

$\mu^{D}{}_{u}K_6(I\alpha)$ =

-	−0.1	0.05
0.1	-	0.25
−0.05	−0.25	-

From Eqs. (3) and (4), we obtain the values of the membership function $\mu_{ND}{}^{u}K_i(I_k,I_l)$ for each pair of variants for each criterion and compile the membership function values for the set of non-dominated variants $\mu_D K_i(I_k)$:

$$\mu_D{}^{*}K_1(I_k) = \{0.6, 1, 0.95\},$$
$$\mu_D{}^{*}K_2(I_k) = \{0.9, 1, 0.6\},$$
$$\mu_D{}^{*}K_3(I_k) = \{1, 0.9, 0.93\},$$
$$\mu_D{}^{*}K_4(I_k) = \{1, 0.8, 1\},$$
$$\mu_D{}^{*}K_5(I_k) = \{0.9, 0.75, 1\},$$
$$\mu_D{}^{*}K_6(I_k) = \{0.95, 0.75, 1\}$$

Based on the analysis of the values) $\mu_D{}^{*}K_i(I_k)$, it can be concluded that option I_2 is the best one based on the criteria $K_1(I_\alpha)$ and $K_2(I_\alpha)$, option I_1 is the best one based on the criterion $K_3(I_\alpha)$ as well as when considering the risk criterion in case of a pessimistic forecast, and option I_3 is the best one in the case of the risk criterion based on the considered set of variants of investment projects.

To determine the preference relation on the set of variants of investment projects, we define the vector preference in a similar way to some previous studies (Orlovsky, 1981; Vedernikov and Mogilenko, 2011). The membership functions $\mu_D{}^{*}K_i(I_k)$ characterize the degree of proximity of the variant I_k to the Pareto-optimal variant of the investment project based on the criterion K_i; therefore, we use criteria instead of the traditional coefficients indicating the importance of the criteria. Then, we compare the variants I_k and I_l in pairs, analyze the values $\mu_D{}^{*}K_i(I_k)$, and introduce the subsets $I_{kl}{}^{+}$, $I_{kl}{}^{-}$, and $I_{kl}{}^{=}$ for the best, worst, and equal values $\mu_D{}^{*}K_i(I_k)$ and $\mu_D{}^{*}K_i(I_k)$ (i = 1...4; k, l = 1,.. 3, $k \neq l$) of these variants, respectively. Then, we define the elements of the evaluation matrix $\mathbf{C} = \left\| C_{kl}^{\mu} \right\|$ based on these conditions; this is shown in Table 3 (Vedernikov and Mogilenko, 2011).

Table 3. Evaluation matrix

I_{kl}^{+}	I_{kl}^{-}	$I_{kl}^{=}$	C_{kl}^{μ}	C_{lk}^{μ}	Notes
Ø	Ø	{1..3}	1	1	-
{1..3}	Ø	Ø	N_2	0	-
Ø	{1..3}	Ø	0	N_2	-
≠.	Ø	≠0	N_3	0	$1 << N_3 < N_2$
Ø	≠<	≠0	0	N_3	-
≠<	≠<	$\left\|S_{kl}^{=}\right\| \geq 0$	Formula (8)	$C_{lk}^{\mu} = 1/C_{kl}^{\mu}$	-

Source: Vedernikov and Mogilenko, 2011

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$$C_{kl}^{\mu} = (\sum_{i=1}^{3} \mu_D^* K_i(I_k))(\sum_{i=1}^{3} \mu_D^* K_i(I_l))^{-1} \quad (8)$$

When creating a matrix of assessments based on the risk criterion, we consider the possibility of the onset of various risk conditions as weighted estimates of matrix elements

$C_{kl}^{\mu} = (\sum^*_{i=1} a_i \mu_D^* k_i(I_k))(\sum^*_{i=1} a_i \mu_D^* k_i(I_i))^{-1}$,
$a_i = \{1, i = 1,2,3$
$p_i, l = 4,5,6\}$

Then, we get the following matrix of preferences

C =

-	0.66	5.01
1.51	-	0.94
0.19	1.05	-

Using the proposed technique based on the theoretical scheme, we introduce the indicators: G^{μ}_l and H^{μ}_l, which are the number of elements of the *l*-th column in **C,** the value of which is less than one, but greater than zero, and greater than one, respectively, and an indicator $C^{\mu}_{kl\ max}$ equal to the maximum value element of the *l*-th column. Then, H^{μ}_l indicates the number of variants of the investment project dominating the *l*-th column. Furthermore, G^{μ}_l indicated the number of variants of the investment project that dominate the *l*-th column, and $C^{\mu}_{kl\ max}$ reflects the maximum degree of dominance of the *k*-th version of the investment project over the *l*-th column.

Let these indicators be included in a matrix, as shown in Table 4.

Table 4. Matrix of indicators

Investment projects, variants Indicators	I_1	I_2	I_3
G_l^{μ}	1	1	1
H_l^{μ}	1	1	1
$C_{kl\max}^{\mu}$	1.51	1.05	5.01

Now, based on Table 3, the best alternative to an investment project with a minimum value $C^{\mu}_{kl\ max}$ is option I_2. Therefore, the second version of the investment project is included in the Pareto tuple and excluded from further analysis by deleting the corresponding row and the column in the preference matrix.

The remaining options are analyzed using the new matrix of indicators in a similar manner.

Finally, the tuple of Pareto preferences can be obtained as $II = \{I_2, I_1, I_3\}$. Therefore, the best alternative for the vector inhomogeneous efficiency index $K(I_\alpha) = \{K_1(I_\alpha), K_2(I_\alpha), K_3(I_\alpha), K_4(I_\alpha), K_5(I_\alpha), K_6(I_\alpha)\}$ should be recognized as the second variant. In the Pareto tuple of the considered variants, preference was expressed for the criteria characterizing the NPV and discounting for the calculation of the DPP in the vector efficiency index.

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4.2. Discussion and further research

The selection of alternatives for implementation from the different investment projects in conditions of uncertainty is a difficult task. Therefore, it is necessary to consider a multidimensional efficiency criterion reflecting the different goals of decision makers, because such decisions might be important for many industries in the national economy. In particular, such decisions influence complex projects such as laying gas and oil pipelines. In this case, many risk factors can be identified, most important of which include (i) the volatility of prices for oil and natural gas, (ii) a significant revaluation of reserves in various fields, (iii) natural disasters, industrial accidents, and political uncertainty; these are described in more detail in Table 5. Therefore, it can be seen that it is important to consider both the multidimensionality of the evaluation criterion and the uncertainty factor when evaluating investment projects (Methodical recommendations on the implementation of pre-investment studies in LLC Gazprom, 2008).

Table 5. Risk priority for oil and gas investment projects

Category	Risk	Description
Economic	Product's price	Volatility and lower prices for oil or natural gas lead to a deterioration in operating results and future prospects
Ecological	Natural disaster	A natural disaster leading to an interrupted or lower production or industrial accident
Operational	Industrial Accident	A major accident or oil spill leading to loss of life, environmental damage, regulatory fines, civil liability, loss of operating license, and damage to reputation
Political	Political instability	Supply disruption due to war, civil war, terrorism, or other political instability within/outside the country
Resources	Availability of resources	Significant change in estimates of oil and gas reserves or development potential

Source: Methodical recommendations on the implementation of pre-investment studies in LLC Gazprom, 2008

In the context of modern information technology development, it is important to develop methods for analysing economic systems based on qualitative data estimates and soft calculations to explore opportunities for certain industrial sectors. Thus, problems of investment projects' evaluation can be supported by adequate scientific statement and solution. Furthermore, specific information of investment projects in various industries is considered for interval data presentation.

The application of a multi-criteria approach for the evaluation of investment projects has advantages and disadvantages. The advantages include factors such as usage flexibility, variability, the use of multiple criteria, and the possibility of comparing and evaluating the entire pool of projects in one period.

In contrast, the disadvantages of using a multi-criteria approach can be attributed to the instability of the external environment and the risk factors that affect the attractiveness of an investment project (Brav et al., 2005).

Further, a major weakness of the IRR method compared with the NPV method concerns the rate at which the cash flows generated by a capital project are reinvested. In particular, the NPV method assumes that cash flows from a project are reinvested at the cost of capital, whereas the IRR technique assumes they are reinvested at the IRR.

To eliminate the reinvestment rate assumption of the IRR, some practitioners prefer to calculate the modified IRR (MIRR) (Rodionova et al., 2013; Bukhvalov et al., 2011). In this approach, each operating cash flow is

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converted to a future value at the end of the project's life, compounded at the cost of capital. These values are then added to obtain the project's terminal value (TV) (Laufman, 1998).

As future work, we might evaluate investment projects based on MIRR.

Conclusions

Our proposed algorithm for selecting an investment project considers the involved risk. Furthermore, aside from accounting for the diversity of economic interests inherent in the economic system, our proposed method considers the uncertainty of the forecasted states of the system under study; this is achieved by describing the risk situations and introducing a multicomponent representation of the risk component as one of the decision criteria.

This approach enhances the possibility of applying the multi-criteria selection method for conditions of economic activity in practice. These real, practical conditions of economic activity include:

- Selecting the form of investment policy;
- Application of the investment project structure;
- Effects of the local or global environment;
- Scope of risk conditions;
- Ability to cooperate and share risks.

Therefore, the method accounts for specific information for the process of adopting a complex economic or managerial decision in the economic system Moreover, our algorithm can be used for making long-term strategic decisions in a risk environment.

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BANKING PERFORMANCE OF CHINA AND PAKISTAN

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Abstract. This study aims to investigate the comparative performance of the banks of the china and Pakistan, as both countries have very strong business relationships apart from the strategic relationships. The recent investment contracts between two countries "One Belt One road" worth $54 billion motive me to do examine the comparative performance of Chinese and Pakistani banks as banks do have vital role in this regard. To give first sight understanding of the objectives of the study, I choose the title which explains the objectives of the study clearly as starting with the comparative study of the banking performance of both countries. As the banks play a magnificent role in an economy for the smooth as well as efficient functioning of the different activities of the society. The importance of the banking could be realized by taking the example of the blood in human body as banks provides blood to the economy of any country. Due to their important role, it is strong need to keep banking sector healthy and stable which is not possible without the continuous focus on it. Recent economic crunch has highlighted that a well-established financial system is the basic ingredient for the economic growth. So it is very important to know what factors derive the performance of the banks. This study main focus is to identifying the factors determining the profitability of the Chinese and Pakistani banking sector. China becomes the economic hub for rest of the world and Chinese banking is also growing significantly. The importance of the Chinese banks could be realized that four Chinese banks are ranked among the top big firms of the world. The study used the Chinese and Pakistani banking sector sample which includes all kinds of banks over the time span of 2010 to 2017. The Chinese banking sample consists of forty four banks while Pakistani banks sample consists of twenty one banks. We observed that Chinese banking profitability which is measured through the Return on Assets (ROA) and Return on Equity (ROE), is positively influenced by the net interest income, deposits, Capital adequacy ratio and GDP growth while non-performing loans are significantly contribute to the performance of the Chinese banking. This relationship exist the same in the Pakistani banking industry. Moreover we found that Chinese banks are performing better than the Pakistani banks because of their big size, higher growth in GDP and due to the government ownership. Furthermore I also conclude this is the golden time for the Chinese banks to go across the border to gain the lucrative opportunity in the Pakistan as the Gawader Seaport is managed by the Chinese government to channel their trade to the Europe. By doing so they cannot only increase their Chinese market share but international market share. Moreover we found that Chinese listed banks perform much better than the unlisted banks of china. Although some unlisted banks perform nicely but overall listed banks produced sound results. Through getting listed and managing the financial resources, they can do cross border business either by mergers, joint ventures or acquisition to overcome the cultural issues. In the case of Pakistan, we observed that foreign banks beat both the domestic private banks and state owned banks. We ranked domestic private banks at number two and state banks performed poorly in case of Pakistan. In the Comparison of Chinese and Pakistani bank, Chinese banks are better than Pakistani banks the factors for the performance react in the same way.

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JEL Classifications: G2 and G21

1. Introduction

Banks are quite important for any society as they are developing the economies by facilitating the business. Banks are around us since the first currencies minted. Currency, particularly the use of coins, grew out of taxation. These coins need to be put in safe place, so ancient homes were not safe so most healthy people held their accounts in temples. There are examples of from Greece, Rome, Egypt and Ancient Babylon that suggest temples loaned money out, in addition to keeping it safe. This was the need of development of the banks to let people save their wealth.

The existence of banks is primary important for us, as with the exception few people can do cash transaction for our basic need like homes. We need support from banks in the form of mortgage or credit facilities to fulfill our daily needs. It would be worthwhile to say here that the world cannot run smoothly without the credit and effective banking system. So for the existence of effective banking system, there is a strong need that banks perform their functions properly to maximize the wealth of the depositors which is not possible without earning reasonable profit.

China being a fastest growing economy has went through rapid economic growth over the past three decades. During this era, banking reforms plays significant role in the economic development. Chinese banking sector was monopolized by the People's Bank of China back till 1979. During the 1980 four state owned banks came into existence named Bank of China (BOC), Industrial commercial Bank of China (ICBC), Agricultural Bank of China (ABC) and China Construction Bank (CCB). The operation of each bank is strictly confined to a given division. From 1998, the state owned specialized banks had been transformed to commercial banks. The People's Republic bank serves as the Central bank of China to manage the money supply through series of monetary policies. Later on with the passage of time, commercial banks started shareholding reforms for the sake of better efficiency and corporate governance. After stripping off bad assets and two round of capital injection in 1998 and 2003, the government took the initiative to transform commercial banks into joint –stock entities. This step gave the way to Chinese banking embarked on the path of "marketization". Later on threefold improvement towards liberalization of the banking system played significant role in shaping the decent banking system. First globally market oriented and modern corporate governance practices welcomed and implemented in the banking business. Secondly government promotes the banking by introducing bank-favored interest spread policies. In the last since 2007, the Chinese government opens door for the foreign players and allowed them to work in the Chinese Currency. The opening doors for the international players foster the efficiency and competition among the domestic banks. By 2010, all state owned banks successfully completed the Initial Public Offering and transformed into listed companies. Meanwhile these reforms significantly boost the financial efficiency of the Chinese banking industry. According to the report of "The Banker", till 2016 Four Chinese banks, ICBC, China Construction Bank, Bank of China and Agricultural Bank of China are all in the top five banks by Tier 1 capital worldwide. "But the good news does not end there for Chinese banks, with many putting in a strong performance further down the ranking" Stefania Palma (2016).The liberty in the banking sector era, foreign banks went on massive expansion in terms of financial institutions and total assets (see Table 1).

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The supervision of foreign subsidiary banks and branches has been developed in three stages. Till 1994, there was limited opening degree of financial industry. The operations of the foreign subsidiary banks was limited to the foreign exchange business of foreign-invested enterprise and in the region of shanghai and Shenzhen. The "Regulations of the People's Republic of China Governing Financial institutions with Foreign Capital" (1994) allows foreign subsidiary banks to open foreign currency operations and throughout the china. In Nov.2011, China Joined the World Trade Organization (WTO) and react in the financial markets as per the commitments of the WTO.

The "Regulations of the People Republic of China on Administration of Foreign-funded Financial Institutions (2011)" and "Detailed Rules for the Implementation of the Regulation of the People's Republic of China on the Administration of Foreign-Funded Financial Institutions (2004)" gave freedom on the foreign exchange business, either in geographical or customer types. However, foreign subsidiary banks started their operations with special licenses and limitations. The regulator provided a national treatment to foreign subsidiary banks and branches, but only for foreign currency businesses. After 2006, both foreign and local currency businesses were fully opened for subsidiary banks and branches without any restriction. Foreign banks started to collect deposits from the public without any restrictions i.e. Licenses or permissions. Invention of modern and innovative financial products was supported by replacing the approval system with the record system which facilitated the product innovation. Meanwhile Basel Core Principles was treated as reference. No doubt foreign banks had their own predominance in Retail banking, foreign exchange business and financial Innovation and intermediary.

The history of Pakistani banking sector is witness to various interesting phases. The first phase starts from the Independence Day march 1947 when there were 3496 offices of Indian scheduled banks out of which 487 were situated in territories now constituting Pakistan. Pakistani banking industry suffers heavy losses due to uncertainty and unsuitability. To put pressure and collapse the new born state many Indian banks closed their offices in Pakistan which shrunk this industry from 487 banks to 195 branches by 1948. During 1971-1972's, new government introduced reforms to promote economic growth through social justice. The objective of these reforms was to make equitable distribution of credit to increase the efficiency and soundness of banks along with social accountability. Banks could not perform their role in social justice, for example credit was given to big accounts and urban area which resulted in shortage of credit in agricultural, small businesses and emerging exports and housing. This attitude of banks forced government to come forward with reforms. Under these reforms State bank of Pakistan got wider powers through which state bank of Pakistan can take some administrative measures. If a director could not fulfill his obligation state bank can fire him/her. Moreover, it was laid down that no person could serve as director of a bank for more than six years continuously. Meanwhile State bank of Pakistan introduced reforms for the establishment of new institutions. More importantly people's Finance Corporation was setup to encourage small business while National Development Finance Corporation established for public and managed industries and enterprises.

After eighteen months of above said reforms, Government of Pakistan nationalized banks with the following objectives: to use the capital concentrated in few rich banks not for the rapid economic growth but urgent social welfare objective also; to made sure the equability credit to various sectors of economy.The act passed by national assembly of Pakistan is known as "Nationalization Act 1974" This was a U turn for Pakistani economy, because by this act, the Chairman, Directors and Executives of various banks which are not appointed by the federal governments are supposed to leave banks. All exiting central and local bodies were dissolved and for the management of these nationalized banks, Pakistan banking council was setup. At that moment there were 14 commercial banks with 3323 offices allover Pakistan and 74 offices in foreign countries were nationalized. During 1991 when it was realized that the role of national banks in the economy over extended which are adversely affecting the growth and efficiency of financial sector. Due to government ownership, political

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intervention into credit allocation and recovery became the big challenge besides the other inefficiencies. As a result there was massive increase in bad loans and banks suffered heavy losses. To respond this issue several policy reforms were undertaken to motivate private sector in this industry. The main objective of these reforms was to improve the efficiency level along with the competition in this market. This act empowered the federal government to sell full or part of share capital in national banks. Through this act governments not only sold the share capital of state owned banks but also welcomed the new banks to strengthen the competition in the market. As a result within two year 11 new banks entered in Pakistani banking industry.

2. Problem Statment

Recent economic crunch has highlighted that a well-established financial system is the basic ingredient for the economic growth. It enables an economy to be flourishing as it facilitates investors with few resources to utilize savings from those with few prospect of investing. In this regard it is crucial to know what factors derives banking profitability. Higher profitability not only accelerate more financing to the economy it is also good for regulators as it guarantees more flexible capital ratios. Additionally higher profitability must lead to higher returns to shareholders which is the ultimate goal of the management of any bank.

Despite all the above facts and the financial reforms in China and Pakistan taken since 1990s, with an aim of improving profitability, efficiency and productivity, banks performance has still remained poor concluded by (Francis 2010). A substantial amount of literature available that shows that poor performance manifest into lower performance of bank factors including poor quality of loans, operational in efficiencies, higher level of liquidity risk and higher amounts of non-performing loans ratios; among others. Although above said are main hurdles affecting Chinese banks performance (Qinwei Chi & Wenjing Li 2017). In the same line Pan and Zhang, (2012) demonstrated that higher government ownership ratio is the cause of risk taking in different businesses. Shih et al. (2007) examined the profitability of the big four, joint stock and city commercial banks through principal analysis and concluded that joint stock banks are better than state owned banks. This lower profitability demonstrates the lack of competiveness in the Chinese banking sector. All these studies, among others show understanding on Chinese banking sector is important. There is strong need to explore what explains the profitability of the Chinese banking.

It would not be wrong to say here that Pakistani banking is the fastest sector of the economy. As per World Bank report, Pakistan has been ranked at second raked on the basis of performance among south Asian countries (Rehman & Raoof, 2010). The competition in the banking industry is growing day by day. Higher pressure on Pakistani economy, political instability and continues changing monetary policies has increased the importance and challenges of this sector. Ramiz et.al (2016) examined the performance of the Pakistani banking and concluded that foreign banks are more profitable than both public and private banks. Moreover they concluded that non-performing loans had adverse affect on the profitability of banking sector of Pakistan. In the same direction as ramiz, Khizer et.al. (2011), concluded that profitability is directly derived by the asset management and operational efficiencies. Pakistani banking is more open as compared to the Chinese banking as there are many foreign banks operating in the Pakistan and the ratio of the state owned banks is significant less which is also the key of the fattest growing sector of the economy. So in this intense environment, banks with the poor performance could not survive for their better survival, banks needs to produce consistent and higher profitability. Returning back to the Chinese banking sector, regardless of the continuous changes and reforms undertaken with an aim of liberalization of sector as recently i.e On December 8, 2016, China banking regulatory Commission (CBRC) announcement “Private Banks Gained Great Progress in Enhancing the Quality and Efficiency of Services for Real Economy”, the concentration and profitability performance of the sector as compared to the pre-reform period , this sector is still suffering from the high competition and operational inefficiencies which is the indication of the poor performance. The same situation is existed in the case of Pakistani banking sector which

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undergone through several reforms over the past two decades. However, even if the aim of the financial reforms to improving the profitability, efficiency and productivity of the Chinese and Pakistani banking industry, both countries performance is still not up to the standard. There is much noise in the literature regarding the Chinese credit risk. According to the Standard & Poor's, changing economic policies can affect the Chinese banking (Asia -Pacific News, 2015).

All above mentioned issues in the banking industry of China and Pakistan in relation to profitability in general and performance in particular with the gap in the literature with respect to performance and the connection between performance and internal and external factors call for the deeper investigation. Furthermore, for the minimization of above posed problems like credit risk, asset management, high liquidity and others related to the performance , identifying the factors affect the banking performance is vital. Therefore this thesis seeks to fill the room by providing the detailed information about internal and external factors affects performance by adding the untouched one and replacing the existing in the Chinese and Pakistani banking context.

In this study, we are going to identify the performance of Chinese and Pakistani banking. We are looking for adequate performance concept and its valuation. However, by applying evaluation process we are going to find the answer of the question "What are the determinants of bank's performance in China and Pakistan, and how do those factors influence the performance of Chinese and Pakistani banks"?

3. Review of Literature

The statement 'too-big- to fail' (TBTF) has been issue for decades in discussion of the banking regulations. This term came into existence in the insolvency of Continental Illinois back in 1984 (Völz and Wedow, 2011). Konstantinos et.al (2016) examined the relationship of the banks earning and size for the UK banks. They used the data of 2000 to 2012. They empirically find nonlinear relationship between the bank size and returns of the UK banks. Poghosyan and de Haan (2012) examined the US commercial, saving and cooperative banks over the period of 2004Q1 to 2009 Q4. By applying the econometric model, they conclude bank size is negatively related to the earning volatility. Similarly Luc Laeven et. al (2016) studied the influence of bank size, capital and systemic risk for the 412 deposit-taking institutions from 56 countries. By employing the Systemic risk regressions, they empirically concluded that bank size is inversely related to the capital of the banks. In the same line Stiroh (2004) examined the same relationship in the US banks and by taking large sample of banks he concludes that there is no link between return on Equity (ROE) and the size of bank. 419 US bank holding companies are examined by De Nicoló (2000). By utilizing the time span of 1988-1998, and finds that there is positive relationship between the Return and small and medium banks while negative relationship between size and larger banks. It gives the conclusion that larger banks do have negative relationship with return while small and medium size banks, there is positive relationship.

The recent 2008, global financial crises proved that financial stability has important role in financial system and especially in the banking sector, both in the developed and developing economies. A sound and profitable banking industry is better able to absorb the adverse shocks and ensure the stability of the financial system. In this way financial stability and monetary policy are closely linked as interest rates and other policy tools, has direct and indirect implications for bank profitability and financial system, as Alessandri and Nelson (2015) showed that bank profitability is a key determinant of the bank capital. Resul Aydemir et.al (2016) studied Interest rates, the yield curve and bank profitability in an emerging market economy in Turkish banking industry. They used the dynamic panel data of 26 commercial banks of turkey for the time span of 2002 to 2014. They concluded that there is a inverse relationship between the interest rates and banks profitability of the studied banks. However they also document that banks in emerging economies are more sensitive with respect to the interest rate as compared to the developed economies like UK.

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The primary aim of the banking regulation is to mitigating the systemic risk comes from the bank failures, to protect depositor's interest and maintaining the financial health of the whole economy. After the recent financial crisis, the US the US Board of Governors of the Federal Reserve System has support the Basel III proposal of the Basel Committee on Banking Supervision (BCBS) that states that there should be more stringent capital and liquidity requirements. Moreover along with the international support, it has been focusing on the strengthening the quantity quality of capital through more stringent minimum ratios (Basel Committee on Banking Supervision, 2010). Starting from the Heba Abou-El-Sood (2016) investigation if regulatory capital adequacy ratios good indicators of bank failure for US banking sector. The author uses the data of 560 US bank holding companies over the time span of 2003–2009, by employing the statistical model, the author documents that there is significant association between the capital adequacy ratio and banks failure.

Literature gives mixed results on the association of capital adequacy ratio and the probability of the bank failure. Furlong and Keeley (1989) investigate regulatory capital is fruitful for the stability of the banking system. They showed that banks with the higher capital ratio, exposure the lower risk. Berger et al. (1995) state that costs of failure are borne by the debt-holders and especially by common stock holders. Therefore debt holder's demands higher returns to offset the failure probability and shift that expected cost to the shareholders. In turn, shareholders mange this cost by increasing the regulatory capital to the point that the reduction in the expected likelihood of failure offsets the reduction in the tax benefits of debt. Bichsel and Blum (2004) study the association between the changes in capital ratios and changes in the level of risk and failed to find any association between the capital ratio and default probability.

China has had a long history with the non performing loans and it is assumed to be the major hurdle to the development of the domestic banks. In the literature Non performing loans bas been identified as the signals of future financial issue for the banks. Demirguc-Kunt (1989) and Barr et al. (1994) argued that failure banks always had higher level of nonperforming loans. Dayong Zhang et. al (2016) examined the Non-performing loans, moral hazard and regulation of the Chinese commercial banking system. They utilized the data of 60 city commercial banks, 16 state-owned banks and joint-stock banks, and 11 rural commercial banks over the time span of 2006–2012. They empirically showed that Non-performing loans causes riskier lending which ultimately leads to the financial instability.

Since 2003, apart from the Chinese banking reforms, the Chinese government inject significant amount of capital in Chinese banks to lower the amount of non-performing loans (Jiang et al., 2013), Furthermore according to the Chinese banking regulation commission (CBRC), the NPL ratio across all the banks has been maintained at satisfactory level which is two percent but does not give the guarantee that there would not be a serious problem in near future. Foos et al. (2010) argue that growth in the loan fruits in the form of loan losses during the upcoming three years which leads a decrease in the interest income and capital adequacy. Soedarmono and Tarazi (2015) show that greater market power in the bank sector might causes to financial instability in the Asia-Pacific context.

The empirical literature on the economic development indentified level of banking development and stock market development are among the most important factors across the countries (Fink, Haiss, & Vuksic, 2009; Beck & Levine, 2004; Garcia & Liu, 1999; Levine & Zervos, 1998; Naceur & Ghazouani 2007; Yartey, 2008). Actually it is ongoing debate that poor countries with the less developed financial system are trapped in Vicious circle, where low development in banking sector and stock market, results in low economic performance and low economic performance leads to low financial development (Fung, 2009). Rudra P. Pradhan et. al (2014) study the Causal nexus between the economic growth, banking development and stock market development with the blend of other macroeconomic variable for the ASEAN countries over a time of 1961–2012. The construct the development

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indices by using principal component analysis and panel vector auto-regressive model for testing the Granger causalities, they argued that there is positive relationship between the economic development and banking development. Therefore for the sound financial system particular banking sector the economic development which is measured through the gross domestic product (GDP), plays vital role.

A strand of literature is evidence that there is positive long-run relationship between economic growth and financial development. All the available studies demonstrate that well developed financial system is growth enhancing and hence confirming with the proposition"more finance, more growth" (Law & Singh, 2014). In the literature the relationship between the economic development and banking development is available with two views, named "supply-leading" and "demand-following"view later on feed has been developed to make clear these relationship between the economic development and financial development.

4. Hypotheses of the Study (HP)

By taking into account the bank's profitability theory that has been developed over the years with the continuous input from the banking area researchers and past banking literature. Hence the present study seeks to investigate following hypotheses for both Chinese and Pakistani banking sector

HP1: There is a significant positive/negative relationship between the deposits of a bank and the bank's performance.
HP2: There is a significant positive relationship between the net Interest Income of a bank and the bank's performances.
HP3: There is a significant Negative relationship between the Non-performing Loans ratio (NPL ratio) of a bank and the bank's Performance.
HP4: There is a significant positive relationship between the Capital adequacy ratio a bank and the bank's performance.
HP5: There is a significant positive/negative relationship between the size of a bank and the bank's performance.
HP6: There is a significant positive relationship between gross domestic product growth and bank performance.

The data for the performance measures, Return on Equity and Return on Assets was collected over the individual banks. The data for the Pakistani banks extracted from the published financial statements while macro economic data extracted from the Federal statistical Bureau of Pakistan (FSBP). However the data for the Chinese banks partly came from China Banking Regulatory Commission (CBRC), reports published by the KPMG a world re-known research company, CSMAR and the data for the macro economic variables comes from the china statistics book 2016. Data on 82 banks in two countries, 61 banks from China and 21 banks from Pakistan were collected. As Mirzaei, Moore, & Liu (2013); the thesis includes all types of banks instead of only active banks and used data from 2010 to 2017. The country level data for the macro economic variables taken from the country concerned department as for the Pakistan is Federal statistical Bureau of Pakistan (FSBP) while for china National Bureau of Statistics of China (NBSC).

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5. Results and Discussion

5.1 Descriptive Statistics

Table 1. Descriptive Statistics of the Chinese banking

Variables	N	Mean	std	Min.	Max
Net Interest Income (RMB Million)	352	40097	86187	100	493,522
Total Assets (RMB Million)	352	1.700e+06	3.6073+06	6,669	2.061e+07
Deposits (RMB Million)	352	1.272e+06	2.826e+06	3,205	1.556e+07
Capital Adequacy Ratio (%)	352	0.130	0.0807	0.00940	1.503
ROA (%)	352	0.0109	0.00360	0.00113	0.0232
ROE (%)	352	0.181	0.0624	-0.0602	0.603
GDP (%)	352	0.0948	0.0208	0.0736	0.142
NPL (%)	352	70.89	37.30	1	157

The overall sample consists of 352 observations of sixty one banks over the time span of the 2008 to 2015. These banks include all types of banks, state owned banks, rural development bank, and city banks and this sample also includes all the listed banks of the china. Starting from the return on Equity we feel that the average ROE among the Chinese banks is 18% which is quite good indication for the progress and growth of the Chinese banking. No doubt China is fastest emerging economy of the world, on one side where the banks are growing so nicely and their higher ROE and huge assets there is one thing noticeable that is the ratio of the non-performing loans which is also 37 percent on average. This is what the most alarming thing in the Chinese banking as in the literature we found studies which empirically shows that non-performing loans are the causes of the financial crisis (see Barseghyan, 2010; Gonzales-Hermosillo, 1999; Zeng, 2012). Another noticeable thing, I found here that in the big four banks which are sharing about which are enjoying almost 32% weighting of the whole Chinese banking industry, they are quite stable as evident from the standard deviation figure in the above posed table.

5.2 Regression Analysis of the Chinese Banks

Table 2. Regression Analysis of ROA of Chinese Banks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Net Interest Income (RMB Million)	.02209**							0.0708***
	(0.0501)							(0.0098)
Total Assets (RMB Million)		0.0231**						0.015**
		(0.0356)						(0.0500)
Deposits (RMB Million)			.0620**					0.0581***
			(0.0249)					(0.0020)
Capital Adequacy Ratio (%)				0.0010***				0.003**
				(0.00238)				(0.00441)

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GDP					0.0132***			0.0214***
					(0.0092)			(0.0562)
Listed						0.0079***		0.0032**
						(0.00045)		(0.0552)
NPL							-.041***	-0.05***
							(0.0428)	(0.00)
Constant	0.017***	0.029***	0.015***	0.037***	0.012***	0.0210***	0.019***	0.018***
	(0.0002)	(0.0031)	(0.0054)	(0.0003)	(0.0089)	(0.00069)	(0.0004)	(0.000044)
Observations	352	352	352	352	352	352	352	352
R-Saqured	0.35	0.52	0.76	0.21	0.67	0.14	0.22	0.43

***P<0.01, **P<0.05, *P<0.10

The above posed model showed the ordinary least square regression being considering Return on Assets is an indicator of the performance of the Chinese banking sector (Table 2). In these table nine models has been employed by taking every variable one by one and in the last model by taking all the variable altogether to check the influence of the studied variables on the performance of the Chinese banking sector. Starting from the net interest income we found it is positively contributing in the performance of the Chinese banking as the main revenue for the banks comes from the interest. Secondly y excluding the interest income we include the total assets which produced acceptable R-square of 52 percent and positively contributing the performance of the Chinese banks industry. In the third model we put the deposits which are the main source of the banking for generating the profits and found positive correlated with the return on assets. In the last model where all the variables taken together we found all variables are significant except GDP, Capital adequacy ratio (Table 3).

Table 3. Regression Analysis of ROE of Chinese Banks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Net Interest Income (RMB Million)	.09708**							0.083**
	(0.00579)							(0.00521)
Total Assets (RMB Million)		-0.06909						-0.02309
		(0.1634)						(0.2308)
Deposits (RMB Million)			.2009*					0.1809
			(0.1009)					(0.2408)
Capital Adequacy Ratio (%)				0.134***				0.120***
				(0.00407)				(0.00321)
GDP					0.0539			0.0498
					(0.160)			(0.155)
Listed						0.00905***		0.00421***
						(0.00791)		(0.0081)
NPL							-.000***	-0.000***
							(0.00740)	(0.0086)
Constant	0.178***	0.1262***	0.1952***	0.2932***	0.176***	0.196***	0.206***	0.207***
	(0.00366)	(0.00366)	(0.00363)	(0.00621)	(0.0156)	(0.0121)	(0.0070)	(0.022)
Observations	352	352	352	352	352	352	352	352
R-Saqured	0.78	0.51	0.63	0.46	0.76	0.32	0.65	0.42

***P<0.01, **P<0.05, *P<0.10

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This table shows the regression analysis for the Chinese banking industry while using return on equity as the measure of the performance. Again firstly each variable is tested independently and later all the variables has been tested in the final model. As per expectation, it is notice that net interest income is significantly contributing in the performance of the Chinese performance which validated the studies see Alessandri and Nelson (2015). More interestingly we found that GDP and Listed do not matter for the performance of the Chinese banking while we measure their influence independently. In the final model which contains all the variables altogether showed that total assets do not have significant role in the performance of the Chinese banking as measured by the roe which validates the concept too big to failure.

5.3 Pakistani Banks Descriptive Statitics

This portion reveals the findings regarding the Pakistani banking sector which is enjoying the intense competition not only with the domestic players but with the international player in the sector. Pakistani baking is full diverse sector with significant foreign bank, domestic private banks and state owned banks. For more details information below is the descriptive statistics of the Pakistani banking sector (Table 4).

Table 4. Descriptive Statistics of the Pakistani banking

Variables	N	Mean	Std	Min.	Max
Deposits (Rupee Million)	68	96348	125512	127.7	591907
Total Assets (RMB Million)	68	1.086e+08	1.447e+08	567,131	7.622e+08
Net Interest Income (RMB Million)	68	6.791e+06	9.385e+06	30,801	5.075e+07
ROE(%)	68	0.00278	0.0047	-0.0251	0.0322
ROA(%)	68	0.0167	0.0415	-0.276	0.108
NPL(%)	68	0.132	0.171	1.58e-05	0.803
GDP(%)	68	0.0383	0.00651	0.0258	0.0554

From this table, we see that the size of the Pakistani banking is quite rich and they are earning good performance on average if we have look on the ROA and ROE. In few years they do have abnormal loss which is due to the financial crisis. It is fact that Pakistan is not affected strongly with the financial crisis of 2008, but they still affected by the financial crunch. As comparison with china, Chinese banks are performing well as their economic growth support them to perform much better than Pakistani banking. Secondly china is enjoying double growth rate as compare to Pakistani banking. The most common descriptive is the issue of non-performing loans. Pakistani banking is also generating enough non-performing loans which are bad for the growth of the Pakistani banking (Table 5).

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5.4 Regression Analysis of the Pakistani Banks

Table 5. Regression Analysis of ROA of Chinese Banks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Deposits (RMB Million)	0.08208***						
	(0.009)						
Total Assets (RMB Million)		0.04811***					
		(0.0076)					
Net Interest Income (RMB Million)			0.00810**				
			(0.0067)				
NPL Ratio				-0.0556***			
				(0.0184)			
GDP					0.111		
					(0.495)		
OW						0.00944**	
						(0.00422)	
Constant	0.101**	0.0966**	0.03400**	0.0938**	0.210	0.00537	0.261***
	(0.00397)	(0.00392)	(0.00387)	(0.00395)	(0.0192)	(0.00904)	(0.0225)
Observations	168	168	168	168	168	168	168
R-Saqured	0.43	0.51	0.67	0.45	0.76	0.63	0.58

***P<0.01, **P<0.05, *P<0.10

The above posed table shows the regression results of the individual variables one by one and in the last model the effect of all the studied variables as we did for the Chinese banking sector. By employing the regression analysis, we found that deposits do have the positive influence in the performance of the Pakistani banking which ultimately increases their interest income which is also positive with the individual effect and along with the other variables in the last model. The most common thing w found is that the non-performing loans are significant influencing the performance of the Pakistani banking in the last regression model which carries the R-square of 0.82 that means higher the non-performing loans lower the performance of the banks (Marco Sorge et. al (2004) and Jakubik and Reininger (2013).

Table 6. Regression Analysis of ROE of Chinese Banks

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Deposits (RMB Million)	0.0869*						
	(0.078)						
Total Assets (RMB Million)		0.05672***					
		(0.000764)					
Net Interest Income (RMB Million)			0.07110***				
			(0.000)				

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NPL Ratio				-0.00335***			
				(0.00214)			
GDP					0.0131**		
					(0.0556)		
OW						0.432***	0.416**
						(0.0153)	(0.0243)
Constant	0.250***	0.160**	0.562***	0.234***	0.779***	0.363***	0.9011***
	(0.000461)	(0.000433)	(0.000426)	(0.000426)	(0.00216)	(0.00056)	(0.00211)
Observations	168	168	168	168	168	168	168
R-Saqured	0.65	0.32	0.63	0.48	0.67	0.69	0.78

***P<0.01, **P<0.05, *P<0.10

From Table 6, once we changed the performance measure which is Return on Equity (ROE) instead of the Return on Assets (ROA) it shows that there Total assets are significantly influencing the performance of the Pakistani banking sector. Meanwhile we also observed that again non-performing loans have their constant negative influence on the performance of the Pakistani banking industry. The R-square of the all models, either the variables are tested individually or in the group within the acceptance range.

Conclusions

This study core aims to identify the main factors that can affect Chinese and Pakistani banks performance and to what extent these determinants exert impact on Chinese and Pakistani banks performance. To achieve this objective, the existing studies on bank performance have been reviewed and it is summarized that the performance of bank is usually expressed as a function of internal and external determinants. The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank-specific determinants of profitability. Whereas external determinants are refers to variables that are not controlled by the bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. Empirical results from previous 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, according to the nature and purpose of each study. Studies for the bank specific variables employ variables such as Total assets, capital, asset non-performing loans, income diversification or costs etc while for external determinants; GDP have been widely used to capture the external factors influence on the performance of banks. The recent financial crises push the scholars to study the governance issues in the banking industry and strand of literature is available in this regard.

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REPUTATIONAL RISKS, VALUE OF LOSSES AND FINANCIAL SUSTAINABILITY OF COMMERCIAL BANKS

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Abstract. Currently, under the conditions of permanent financial risks that hamper the sustainable economic growth in the financial sector, the development of evaluation and risk management methods both regulated by Basel II and III and others seem to be of special importance. The reputation risk is one of significant risks affecting reliability and credibility of commercial banks. The importance of reputation risk management and the quality of their assessment remain relevant as the probability of decrease in or loss of business reputation influences the financial results and the degree of customers', partners' and stakeholders' confidence. By means of imitating modeling based on Bayesian Networks and the fuzzy data analysis, the article characterizes the mechanism of reputation risk assessment and possible losses evaluation in banks by plotting normal and lognormal distribution functions. Monte-Carlo simulation is used to calculate the probability of losses caused by reputation risks. The degree of standardized histogram similarity is determined on the basis of the fuzzy data analysis applying Hamming distance method. The tree-like hierarchy based on the OWA-operator is used to aggregate the data with Fishburne's coefficients as the convolution scales. The mechanism takes into account the impact of criteria, such as return on equity, goodwill value, the risk assets ratio, the share of the productive assets in net assets, the efficiency ratio of interest bearing liabilities, the risk ratio of credit operations, the funding ratio and reliability index on the business reputation of the bank. The suggested methods and recommendations might be applied to develop the decision-making mechanism targeted at the implementation of reputation risk management system in commercial banks as well as to optimize risk management technologies.

Keywords: reputation risks; commercial banks; business reputation; sustainable development; value of losses; economic modeling; risk level

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1. Introduction

In the era of dynamic transformations in the financial sector of economy, tightening of requirements towards credit institutions and strengthening of competitive struggle among them make the issues of bank risk management, which include not only traditional forms of risks – credit, market, operational, liquidities, but reputation as well, more urgent (Dong et al., 2014; Vasylchak and Halachenko, 2016; Strielkowski et al., 2016; Masood et al., 2017). This can be explained by possible losses due to non-compliance with the legislation requirements, the absence of the mechanisms allowing the banks to reconcile the conflict of interests efficiently, the disability to counteract legalization (laundering) of the criminal income and other illegal activities, the drawbacks of the risk management, the negative information in the mass media, the rating downgrade and the loss of positive business image and trust from clients and partners, etc. (see e.g. Janda et al., 2013; Mostenska, 2015; Jiroudková et al., 2015; Štreimikienė et al., 2016; Hosťovecký and Poláčik, 2016; Simionescu et al., 2016; Moyseyenko and Ryvak, 2016; Andreeva et al., 2017; Tvaronavičienė, 2018).

Our novel approach to the market analysis of banking services and the main tendencies of its development is an important condition for revealing reputation threats, factors and causes of reputation risks. So, the modeling of the losses and risk level are efficient tools which enable risk management divisions to make decisions on further strategy.

2. Theoretical Framework and Methodology

According to standards of the international banking, every commercial bank has to develop the information security threat model which would include the description of threat sources, the vulnerabilities used by threats, methods and objects of the threat implementation, possible loss types (for example, confidentiality, integrity or assets availability) and scales of potential damage. These recommendations suggest the development of full-fledged risk model on the scenario-based analysis. The threat and violator model assess certain sources of threats (risk factors), which can cause damage to the organization with the vulnerabilities existing in this element, with each asset (Goh et al. 2015; Abrham et al., 2015; Strielkowski and Höschle, 2016; Zielińska, 2016).

In addition, the violator model includes the description and classification of violators, their experience, knowledge, resources available for threat implementation, their possible incentives and methods of threat implementation. Threat model is the characteristic of actual threat sources, methods of their implementation, objects suitable for threat implementation, types of possible losses and scales of potential damage (Evans et al., 2014; Amel-Zadeh et al., 2017).

It is important to establish the acceptable risk level, the expected damage which the organization in the particular time and particular situation will be ready to handle. The plan outlining one of the possible methods of withstanding each of the unacceptable risks: transfer of risk to the third parties (for example, insurance company); risk aversion (for example, by abandoning risk-bearing activities); conscious acceptance of risk; development of risk-reducing requirements should be developed.

Furthermore, the qualitative and quantitative evaluation based on threat probability caused by existing and (or) potential sources of threats in threat and violator model and severity of their consequences should be offered. A similar approach can be applied to reputation risks as well. Given limited techniques of their assessment and the need to combine quantitative and qualitative methods, the approach which allows their combination alongside with expert evaluation and statistical information on the value of losses as well as modeling of cause and effect

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relationships would be the most appropriate. The development of causal models, the use of Bayesian Belief network in particular, could become the best solution of this problem.

Bayesian networks are graph models of the probabilistic and cause ↔ effect relationships between variables in statistical information modeling which combine empirical frequencies of various values, subjective estimate of "expectations" and theoretical concepts of mathematical probabilities of various effects from aprioristic information.

Therefore, one can conclude that the probability of top *R* in various conditions (R_k) depends on conditions (n_i , S_j) tops *n* and *S* and is calculated by the formula (1):

$$p(R_k) = \sum_i \sum_j p(R_k \mid n_i\, S_j) \; x \; p(n_i \mid S_j) \qquad (1)$$

where $p(R_k \mid n_i\, S_j)$ is the probability of R_k condition depending on conditions n_i, S_j. As the events represented by tops *n* and *S* are independent, as yielde in (2):

$$p(R_k \mid n_i, S_j) = p(n_i) * p(S_j). \qquad (2)$$

Therefore, the frequency of losses will be influenced, in its turn, by the frequency of threat impact which depends on the level of control (the degree of the risk controlled by the bank) and the threat capacity which is often out of control, while reputation assets and the degree of their vulnerability will affect the value of losses
In this case, in order to calculate tops *n* and *S*, we use the same formula as for $p(R_k)$. Then we can express this as follows (see (3) and (4)):

$$p(n_i) = \sum_m \sum_n p(n_i \mid A_{1m}\, ,B_{1n}) \; x \; p(A_{1m}) \; x \; p(B_{1n}) \qquad (3)$$

$$p(S_j) = \sum_m \sum_n p(S_j \mid A_{2m}\, ,B_{2n}) \; x \; p(A_{2m}) \; x \; p(B_{2n}) \qquad (4)$$

From formulas (3) and (4) it is obvious that *R* conditionally does not depend on A_1, A_2, B_1, B_2 as there are no arrows which directly connect these tops. Therefore, the directed acyclic graph possesses the following properties:

- each top represents the event described by a random variable which can have several conditions;
- all tops connected with the parent variable can be defined by means of conditional probability tables or conditional probability function;
- for the tops which are not connected with the "parent", the probabilities of conditions are unconditional (marginal).

Therefore, the tops represented by accidental variables and the ribs represented by probabilistic dependences can be defined by means of the probability conditional table which includes probabilities of these top conditions depending on the value of their "parents".

The benefit of this approach is the possibility to assess some risk events by applying Bayes's theorem (according to experts' knowledge only), and others by plotting cumulative distribution function based on empirical data on losses if the latter are sufficient for modeling.

As the development of Bayesian network for the risks assessment is labor-consuming, it can be used for the most significant risk factors and the most valuable and highly risk-sensitive assets.

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Threat sources and possible risk events, which are supplemented with models' violators, are the basic elements of Bayesian network concepts (Zinkevich and Shtatov, 2007). Moreover, the model should include the events which can arise as a consequence of risk implementation in bank assets. In this case, the bank suffers its main losses as the greatest damage to bank is caused by the related interruption or violation of business processes relevant for the implementation of the bank mission rather than by the risk factors.

Having plotted the directed graph, the authors assessed the concepts included in it: the probability of risk events and the value of related losses. The first indicator can be specified in a Bayesian network either as a continuous distribution function or as a table of probabilities, i.e. as discrete probabilities.

As continuous functions of distribution can be applied only in rare instances given insufficient empirical data, discrete distributions can be considered as the most appropriate. Absolute probability of each possible outcome should be specified for the concepts without entering arrows on the graph (for example, the events which are risk factors). For the concepts which are influenced by other concepts, it is relevant to specify the conditional probability for each combination of the related concepts. The task is easier to achieve if concepts are identified correctly, i.e. all types of losses are revealed, and there are no irrelevant ones (Zinkevich and Shtatov, 2007). Thus, at the first level of classification, the effects should be grouped according to the changes in reputation assets: for intangible assets – violation of integrity, availability, confidentiality, for tangible assets – the damage, from the complete loss of an asset to the interruption of the business process for the short period of time. It is possible to apply scoring as well. At the second level of loss classification, the following criteria can be considered: lost profit; penalties; loss of employees' working hours, labour productivity decline; reputation loss, etc. Such two-level classification allows us to compare damage with the cost assessment to manage risks.

In some systems which realize Bayesian Belief network the Noisy or Gate method can be used to simplify the calculating process. It is based on the fact that the top R can be conditionally independent of a number of tops A_i where i = 1, 2..., n. This method could be applied to simplify the assessment of probabilities which have to be used in the tables of conditional probabilities (see (5)):

$$p(R \mid A_1, A_2, \ldots A_n) = 1 - \prod^{n}_{i=1} (1 - p(R \mid A_i)) \quad (5)$$

It allows users to estimate only $p(R|A_1)$, $p(R|A_2)$ ... $p(R|A_n)$, which will lead to the estimation of $p(R|A_1, A_2 \ldots A_n)$. Fuzzy and multiple descriptions or the fuzzy data tools should also be used in reputation risk modeling (Nedosekin, 2004a). As the histogram is a mathematical object of the following type (6):

$$G = \{X, N, \Delta, Z\}, \quad (6)$$

where $X = [x_{min}, x_{max}]$ is the indicator interval for the analysis;

N is the number of histogram bins;

$\Delta = (x_{max} - x_{min})/N$ is the histogram step;

Z is the vector of the number of quasi-statistics matching the corresponding bin of the histogram with dimension N,

As we have used the normal distribution, in the rated histogram vector Z is replaced with vector (see (7)):

$$Z_i = Z_i / max_t Z_i \quad i = 1, \ldots N \quad (7)$$

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According to the fuzzy-set theory, it is possible to assess the measure of rated histograms similarity by the Hamming distance (Hamming, 1950; Ayala, 2012). In this case, similar histograms have similarity measure 0, and dispersing histograms have measure 1, so the standard 01-carrier is the criterion carrier.

As a rule, the criterion of similarity is given linguistic interpretation in the form of a pentascale: VL – very low; L – low; M – medium; H – high; VH – very high.

The objective of the research is to determine risks and losses in linguistic interpretation according to a pentascale where each verbal element corresponds to a fuzzy number. In case of the standard pentascale determined on 01-carriers, x-coordinates of neutral points on 01-carriers are (0.2; 0.4; 0.6; 0.8) (Nedosekin, 2004b).

Therefore, if very low value of factor x is within the range between 0 and 0.25, but the expert is not confident in the assessment, he specifies that in case of $x > 0.25$ the level is not very low, and in case of $x < 0.15$ the level is very low. Then, interval [0.15; 0.25] will be the uncertainty area in the assessment which can be described by an inclined rib of the trapezoid fuzzy number. The advantage of such description is the neutral point in the middle of the uncertainty interval and a steady decrease in expert confidence in classification with the simultaneous growth in x (Barth et al., 2017).

Trapezoid numbers are called the fuzzy interval as a trapezoid number could be described with the following statement: "low parameter value of x fluctuates somewhere from 0.2 to 0.4". The word "somewhere" means that the left end of the interval equals approximately 0.2, and the right is about 0.4, and this approximate movement is interpreted by a trapeze rib with the corresponding inclination.

The next step is plotting the pentascale on the basis of the normal distribution histogram, the calculation of the average value μ and the mean-square deviation σ. So, the set of five nodes of the five-level qualifier is as expressed in the following system (8):

$$\begin{aligned} \mu_1 &= \mu - t_1\sigma, \\ \mu_2 &= \mu - t_2\sigma, \\ \mu_3 &= \mu, \\ \mu_4 &= \mu + t_2\sigma, \\ \mu_5 &= \mu + t_1\sigma, \end{aligned} \qquad (8)$$

where t_i are coefficients (Student's distribution).

For each node, the factor level is identified with absolute confidence. For example, point μ_1 corresponds to a very low factor level (VL), μ_2 – to low (L), etc.

If the interval $[\mu_i, \mu_{i+1}]$ is divided into three areas: an area of absolute confidence, an area of lower confidence and an area of absolute uncertainty, the length of these three areas is the following proportion: $1 : r : 1$, where parameter $r \geq 0$ means the degree of uncertainty. In case of a standard pentascale on 01-carriers, $r = 2$, therefore the choice of r remains at the discretion of developers.

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1. Analysis of empirical model

We have calculated the frequency of losses and their value as a result of risks impact on business reputation of the banks under investigation, which is illustrated by the example below. The directed graph has eight tops according to the integrated group of possible losses from implementation of reputation risks on eight most significant criteria (Table 1).

Table 1. The value of expected losses as a result of risks impact on business reputation of Bank B

Type of threats	**Losses frequency, %**	**Expected value of losses, cur. un.**
1. Obtaining credit with falsified documents	1.333	8,316,521.2
2. Partial or complete loss of the credit collateral	15.09	94,145,765.5
3.Violation of the loan restructuring order	7.549	47,097,838.5
4. Failures in IT systems	7.735	48,258,283.4
5. Money shortage in cash machines	1.28	7,985,856.8
6. Miscalculations and money shortage in a collector bag to be sent to the payment processing center	23.906	149,148,354.5
7. Cash plundering from the cash desk by an employee	41.233	257,250,652.6
8. Other	1.874	11,691,793.5
Total	100	623,895,066
Arithmetic average	-	77,986,887
Mean square deviation	-	87,380,635

Source: Own results

The calculation of losses probability from reputation risks implementation in Bank B was carried out through Monte-Carlo simulation, normal (Gaussian) distribution.
For modeling, lognormal distribution can be used, assuming that each following value has less value than in the previous period.

The normal distribution of the values which are within the range between 10 million currency units (minimum) and 260 million currency units (maximum), according to the data on possible losses from operating mistakes by employees (table 1), is represented in Figure 1.

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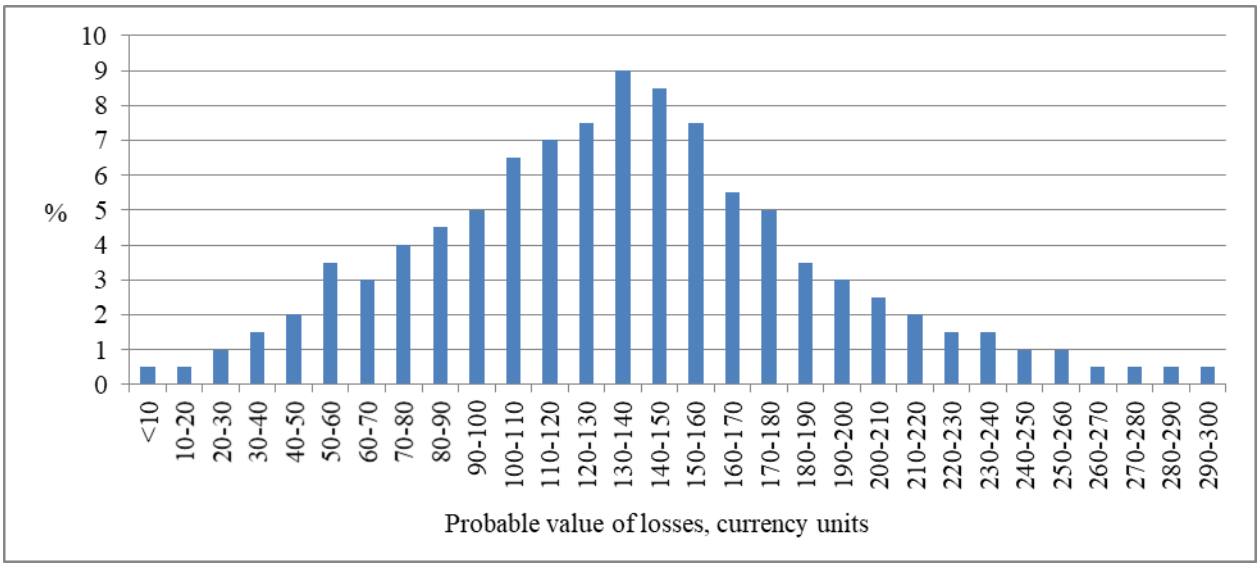


Fig. 1. Distribution of losses probability as a result of operating mistakes by employees, %
Source: Own results

As we have used only 100 random values, the distribution appears to be quite asymmetric. Nevertheless, 97.5% of values are within the range between 10 and 260 million currency units. To increase Monte Carlo simulation accuracy at the following stage, we have created 10,000 scenarios on all risk groups. The bar chart of the total losses distribution is represented in Figure 2.

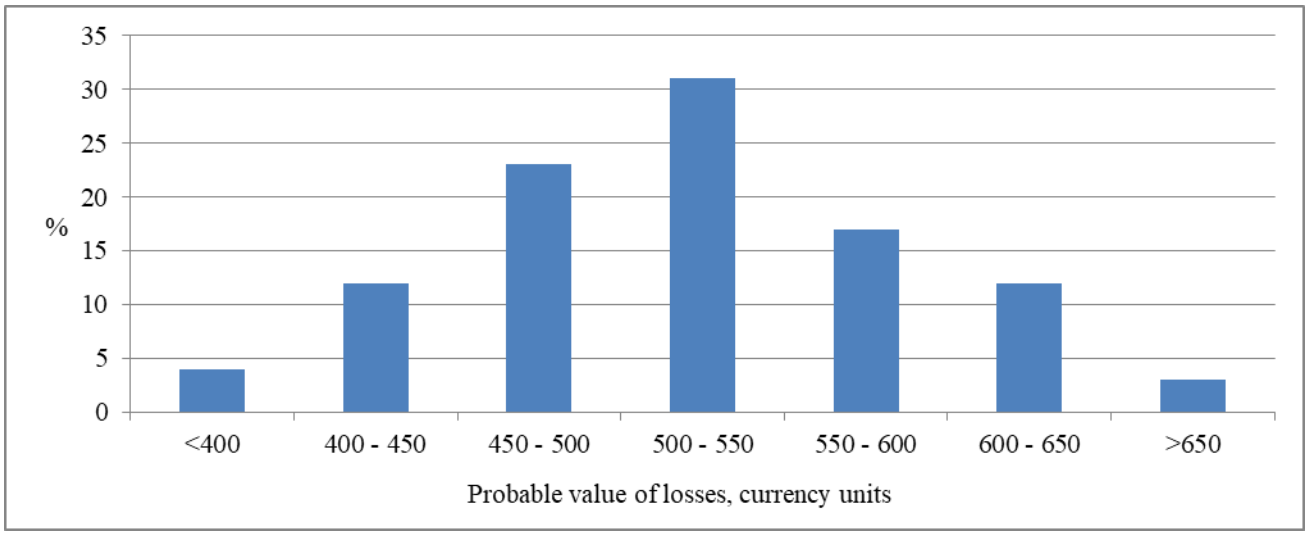


Fig. 2. Distribution of total losses probability, in %
Source: Own results

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2. Discussion of the model results

About 16% of risk implementation lead to losses of less than 450 million currency units. It means that the probability of losses is 16%, which represents a substantial risk. Applying fuzzy data method (figure 4), according to the histogram for the carrier x = [0, 300] we have calculated: μ = 150, σ = 90.92. As far as r = 1, then all areas (confidence – lowered confidence – uncertainty) have equal length.

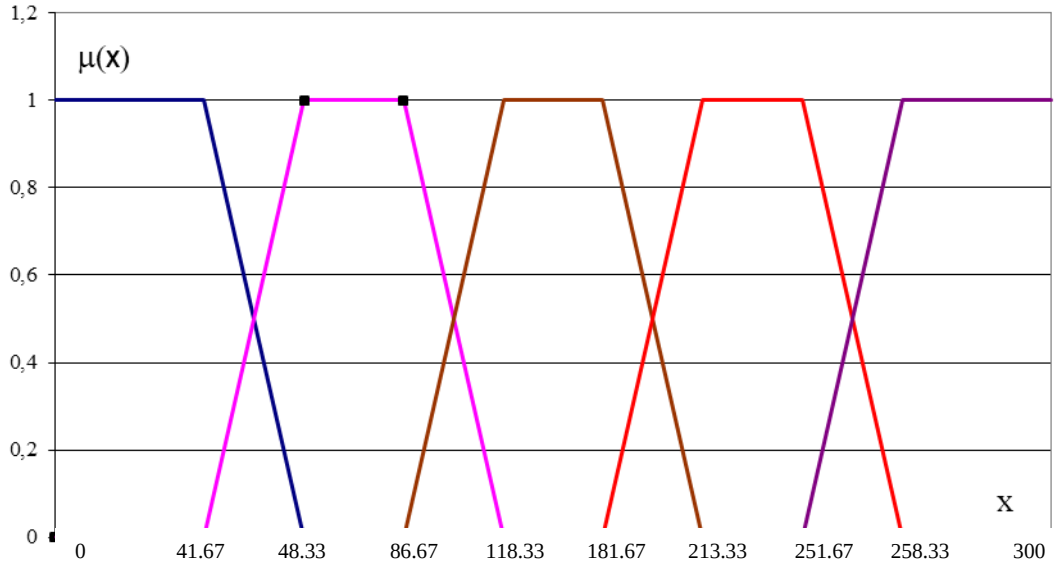
Histogram's carrier 35 is considered to be very low in terms of expert method while carrier 265 is very high. Consequently, t_1 = (150 - 35) / 90.92 = (265 - 150) / 90.92 = 1.265. Carrier 55 is low, therefore t_2 = (150 - 55) / 90.92 = 1.044. Respectively, $\mu_4 = \mu + t_2\sigma$ = 150 + 1.044 * 90.92 = 245.

Thus, the intervals of absolute confidence areas are as following:

VL: [0; 35 + (55 - 35) / 3] = [0; 41.67];
L: [55 - (55 - 35) / 3; 55 + (150 - 55) / 3] = [48.33; 86.67];
M: [150 - (150 - 55) / 3; 150 + (245 - 150) / 3] = [118.33; 181.67];
H: [245 - (245 - 150) / 3; 245 + (265 - 245) / 3] = [213.33; 251.67];
VH: [265 - (265 - 245) / 3; 300] = [258.33; 300].

Respectively, using nodes and absolute confidence intervals, the pentascale represented in Figure 3 could be plotted.

Fig. 3. Pentascale for the histogram of losses probability caused by cash plundering by employees



Source: Own results

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Therefore, interpreting the values, it is possible to make a conclusion that the value of losses from 0 to 41.67 million currency units is very low for the bank under investigation, from 48.33 to 86.67 million currency units is low, from 118.33 to 181.67 is medium, from 213.33 to 251.67 is high and over 258.33 is very high.
According to figure 3 representing the probability of the general losses distribution for the carrier x equals [0, 700], μ equals 350, σ equals 223,6. As far as $r = 1$, then all areas (confidence – lowered confidence – uncertainty) have equal length.

Carrier 150 is very low, and carrier 550 is very high. Then, $t_1 = (350 - 150) / 223.6 = (550 - 350) / 223.6 = 0.894$. Moreover, if carrier 250 is low, $t_2 = (350 - 250) / 223.6 = 0.447$. Respectively, we obtaiin $\mu_4 = \mu + t_2\sigma = 350 + 0.447 * 223.6 = 450$.

Thus, intervals of absolute confidence areas are as following:

VL: [0; 150 + (150 - 350) / 3] = [0; 83.33];
L: [250 - (250 - 150) / 3; 250 + (350 - 250) / 3] = [216.67; 283.33];
M: [350 - (350 - 250) / 3; 350 + (450 - 350) / 3] = [316.67; 383.33];
H: [450 - (450 - 350) / 3; 450 + (550 - 450) / 3] = [416.67; 483.33];
VH: [550 - (550 - 450) / 3; 700] = [516.67; 700].

Therefore, the value of losses from 0 to 83.33 million currency units is very low for the bank in question, from 216.67 to 283.33 is low, from 316.67 to 383.33 is medium, from 416.67 to 483.33 is high and over 516.67 million is very high.

We should emphasize that in the future it is possible to specify the qualifier based on additional data or conclusions as well as to move nodes and to receive new membership functions.

For further research, we applied the fuzzy-set theory. Using the two-level Bayesian network (figure 2), we have imposed preference relation system F on it (9):

$$F = \{S_1\} = n;\ B\imath\ \} = A\imath\ ;\ B\imath\ \} = A_1\ \} \qquad (9)$$

where }= means preference, and ≈ means indifference.

To make quantitative and qualitative risk assessment, aggregating of the data represented within tree-like hierarchy along the graph ribs should be done. The OWA (OWA – Ordered Weighted Averaging – averaging with the ordered scales) operator (Yager, 1993) is applied to aggregating, and Fishburne's ratios are the scales in rollup.

For each indicator of the second level hierarchy in decreasing preference system of N alternatives Fishburne's coefficients are calculated (Trukhaev, 1981; Fishburne, 1978) by the formula expressed in (10):

$$p_i = 2(N-i+1)/(N+1)N \quad i=1, \ldots N \qquad (10)$$

where p_i is Fishburne coefficient for indicator x_i;

N is the total quantity of indicators in hierarchy, $N > 0$;
i is the sequence number of indicator x_i in the group.

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In the system where *N* alternatives are indifferent to each other, the set of equal scales is as shown in (11):

$$p_i = N^{-1} \quad i = 1, \ldots N \tag{11}$$

At the same time, if the preference relations are the parts of the system only, then (see (12)):

$$r_N = 1, \quad r_i\text{-}1 = r_i + 1, \; K = 1 + 2 + \ldots + N = N(N+1)/2 \tag{12}$$

where r_i are the numerators of recursive fractions;

K is the amount of numerators or the common denominator of Fishburne fractions.

That is the presented in (13):

$$p_i = r_i / K \tag{13}$$

The standard qualifier usually maps fuzzy linguistic description on the 01-carriers by a consistent method, symmetrizing the classification nodes (0.1; 0.3; 0.5; 0.7; 0.9). The values of the membership function in these nodes equal 1, and all other functions equal 0. Experts' uncertainty in classification decreases (increases) linearly as it moves away from the node (approaching the node, respectively); at the same time the number of membership functions in all carrier points equals 1 (Nedosekin, 2004a).

Therefore, if linguistic values are known for each indicator ($F_{*.1} \ldots F_{*.N}$) on the chosen hierarchic sublayer, and the system of Fishburne scales on the preferences-based system *F* is calculated, the linguistic values will be calculated from ratios of membership function sets. These risk levels for the graph-based hierarchies are shown in Table 2 that follows.

Table 2. Matrix of risk level of bank B based on membership functions and Fishburne coefficients

Factor		**Fishburne scales**	**Risk level**				
			VL	**L**	**M**	**H**	**VH**
R	*Reputation risk*						
S	*Value of losses*						
B2	Asset vulnerability	0.428	0	0.22	0.78	0	0
A2	Cost of reputation asset	0.286	0	0.36	0.64	0	0
n	*Frequency of losses*						
B1	Threat capacity	0.143	1	0	0	0	0
A1	Frequency of threats impact	0.143	1	0	0	0	0

Source: Own results

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As it appears from our results, the bank's reputation risk level and the value of losses are estimated as medium. Moreover, it turns out that in spite of the low level of losses frequency depending on threat capacity and frequency of threats impact, the risk level is assessed as medium due to other factors (asset vulnerability and cost of reputation asset) prevailing in the "average" values.

3. Conclusions and overall discussions

In general, the sequence of the described approach is as follows: First of all, one should run a calculation of absolute probabilities of risk implementation based on the conditional probability formula allowing banks to estimate them by comparing the set of conditional probabilities and the known probabilities of risk implementation or the causes (factors) of risk implementation.

Second, calculation of each outcome probability for every risk case by consecutive movement along the networks and application of Bayes theorem along with the conditional probability formula should be applied.

Third, calculation of probable value of losses from risk implementation based on the statistics and expert methods by analogy with other organizations taking into account scale effect should be done. The value of real financial loss can be evaluated on the basis of an experts' experience or the operating losses method. Losses can be also estimated in probabilistic terms using confidential intervals or distributions. The expert method (based on the modified Delfi method) which includes the assessment of reputation relative characteristics is of greater use as it allows banks to estimate the clients outflow, the decrease in new accounts and deposits opened, etc.

Fourth, the total risk assessment should be summed up by adding up losses distributions on several risk events. Adding up should be done to calculate the expected and unexpected value of losses calculated on the basis of the arithmetic average and VaR which is the aggregative distribution of bank's risk. Such addition in Bayesian network is carried out, as a rule, by means of Monte-Carlo-simulation based on the imitation of accidental emergence of various outcomes of events-drivers which move to network entrances.
Summing up our results, it is possible to conclude that the our suggested mechanism of reputation risks assessment according to functional dependence of the bank's business reputation impacts on a number of criteria: return on equity, goodwill value, the share of uncommitted (free) resources in assets, risk assets ratio, productive assets share in net assets, efficiency ratio of interest bearing liabilities, risk ratio of credit operations, overdue debt share in total loan debt, funding ratio and reliability index on the business reputation of the bank. It is based on the combination of imitating modeling, statistical analysis and expert evaluations.

In addition, under advanced international requirements currently applied to banking, the development of evaluation and risk management methods both regulated by Basel II and III and others is of utmost importance. The reputation risk is one of significant risks affecting reliability and credibility of a bank. All in all, one can see that the suggested methods and recommendations might be applied to develop the decision-making mechanism targeted at the implementation of reputation risk management system in commercial banks as well as to optimize risk management technologies.

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PERCEPTION OF PRIVATE TELECOM EMPLOYEES TOWARDS UNFAIR HRM PRACTICES: AN EMPIRICAL INVESTIGATION

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Abstract. The aimed of this research paper is to explore the unfair human resource management (HRM) practices in the private telecom company located in the Kingdom of Saudi Arabia. The total 120 employees were selected randomly from two private telecom companies to gather the information about the unfair HRM practices for this research. A questionnaire that consists of biographical information blank and unfair HRM practices was administered to the employees to identify the unfair HRM practices. The questionnaire was validated using appropriate techniques and the level of unfair HRM practices among the sample was assessed. The results of the study have provided some interesting findings relevant to the current industries. The investigator has incorporated certain suggestion to implement fair HRM practices so as to create vibrancy and passion among the employees to perform effectively.

Keywords: Telecom sector; Unfair HRM practices; construction and validation; Saudi Arabia

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JEL Classifications: L26, O10, C20

1. Introduction

The topic of HRM practices attracted the attention of employer and employee in several ways over the decades and it is a universal truth that for any organization human resource is considered as one of the most important pillars and medium to accomplish the competitive advantage. Danish and Usman (2010) opined that success and growth of the organization depend on the employee, who considered employee as a valuable asset in the organization. As we know that human behavior is very complex and managing such behavior is one of the biggest challenges of the manager as compared to others like technology or finance to make the organization more viable, thereby, organization needs structure and such structure should be backed by human resource practices. This

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particular research conducted on employees working in private telecom sectors in the Saudi Arabia to explore the understanding of fair or unfair HRM practices. The findings of the research would be added some new value or knowledge in the area of studies such as organizational behavior, organizational development and human resource management. The organizational success totally depends on equity treatment of the employees and development of the human resource. These treatments would help the employees to develop their organizations into ambidextrous ones (Sulphey and AlKahtani, 2017a) and take on the challenges faced by them in current world. Thereby, it can be considered to be the management responsibility to overcome or lessen the unfair HRM practices which are prevailing in any sectors and generate a conducive work environment in the form of fairness in the telecom sectors. These aspects are prerequisites to make the respective organizations have the badly required quality of sustainability (Sulphey, AlKahtani, 2017b; Jurigová et al., 2016). The indispensable role played by HR in creating sustainability in organizations has been highlighted by many studies (Korauš, Kaščáková, Parová and Veselovská, 2017; Prause, 2015). This is all the more important in countries like Saudi Arabia which is striving to make their workforce efficient, effective and productive.

2. Review of literature

On the globe numerous study has been initiated by the researchers on HRM practices with different variables, finally, they observed or suggested that fair HRM practices directly or indirectly increases the performance of the employees, enhancement of job satisfaction & commitment, better career prospects, intention to stay in the organization, lower level of absenteeism, low turnover, minimizing the job stress, feeling comfortable to dealt with senior or junior or peer (Hassan 2016; Al Kahtani et al, 2016; Allam, 2017; Al Kahtani & Allam, 2016; Ali & Allam, 2016; Singh & Kassa, 2016; Allam & Harish, 2010; Tan & Nasurdin, 2011; Al Kahtani & Nawab, 2013: Boxall et al, 2011; Paauwe and Boselie, 2005; Allam, 2007; Lai, Saridakis, Johnstone, 2017; Mura et al. 2018; Katou and Budhwar, 2010).

Katou and Budhwar (2010) jointly conducted a study among 178 Greek organizations to check the impact of HRM on organizational performance. They found five HRM practices such as training and development, job design, employee participation, compensation & incentives and recruitment. They observed positive relationships with HRM practices variable and organizational performance. Tan and Nasurdin (2011) conducted a study among employees working in Malaysia and revealed that HRM practices particularly training were found to be positively related to the dimensions of organizational innovation such as process innovation, product innovation and administrative innovation. Further, they opined that performance appraisal also has a significant impact on administrative innovation and both training& performance appraisal led to associated effectively with knowledge management.

Lai & Saridakis (2013) concluded that HR practices such as training & development and recruitment & selection are designed to improve the overall capabilities of the workforce, however, HR interventions like reward based on performance, incentive payment and appraisal are planned to inspire the employee to stay in the organization and put extra efforts at work to achieve the goals. It is noted that HR practices i.e. adequate training has no association with retention but still considered as one of the most vital components of employee retention and satisfaction (Terera & Ngirande, 2014). Hassan (2016) concluded in their research paper that HRM practices such as career planning, training, compensation, performance appraisal and employee involvement found to be associated positively with performance.

Recently Lai, Saridakis, Johnstone (2017) observed positive association between HR practices and financial performance which has been differed among SMEs with the higher level of job satisfaction and low job satisfaction. Also studies have revealed that the association declined in SMEs with due to high job satisfaction. The researcher indicated that HRM practices have complementary and synergistic effects on the attitude of the

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workforce those surpass their individuality effects (El-Ghalayini, 2017). Further, he emphasized that there are positive effects of some HRM practices on attitudinal consequences. A study by Sandhya and Sulphey (2014) examined the influence of the previous work experience on HR practices and the psychological contracts of employees and found them to be associated. A fair review of the literature could identify only scant literature related to unfair HR practices.

3. Objective of the study

As stated earlier there is no dearth of literature about HRM practices and innumerable studies have been conducted across the globe. However, a fair review of literature failed to identify studies about unfair HRM Practices. No suitable tools to assess unfair HRM practices were also found. The present study is intended to bridge this gap in literature. It is aimed at exploring the attributes of unfair HRM practices prevailing in the private telecom sectors in Kingdom of Saudi Arabia. Towards this a suitable tool to assess unfair HRM practices is also sought to be constructed and validated, It is also an objective to identify the relationship between perceived unfair HRM practices and various demographic factors.

4. Methodology

Sample of the study:

The data for the current research were collected from 120 employees selected randomly from two different private telecom sectors namely Zain (47.5%) and Mobily (52.5%), in Kingdom of Saudi Arabia (K.S.A.). All respondents were male with varying experience and age. The details pertaining to the demographics of the sample are also presented.

Tools:

A fair review of literature could not identify a suitable standardized tool to assess the perceived unfair HRM practices. As such it was decided to construct and validate an appropriate tool to assess the level of unfair HRM practices. Many classical studies have provided the various scientific processes that could be used to construct strong tools (Cabrera-Nguyen, 2010; Kumar & Beyerlein, 1991; Hinkin, 1998; Worthington, and Whittaker, 2006). Kumar & Beyerlein (1991) in his pioneering study identified the steps to be taken for item selection, reduction; as well as the reliability and validity of the tool. The pioneering study by Schwab (1980) presented the stages of item generation, the development of the scale and its psychometric evaluation. Worthington, and Whittaker (2006) has also elucidated how to develop scale in similar lines. The present study has taken cues from the above studies to construct the tool.

Creation of item pool

The items for the present study were gathered after review of the literature on the topic. Hinkin's (1998) guidelines about hot to develop a tool was born in mind while doing this. Though in the initial stage many items were developed, based on the related literature, 10 items were identified after purifying the initial pool.

This was done based on the opinion of Hinkin (1995) about the importance of the length of the scale. He opined that both too long and too short scales would deliver "negative effects on results". Earlier studies, for instance Anastasi (1976) and Schriesheim & Eisenbach (1991) viewed that an effective way of solving problems associated with demands of time is to maintain the scale short. It also has the advantage of minimizing the problem of response biases, and respondent boredom and fatigue. Substantiating this Carmines & Zeller (1979)

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opined that if the number of items is increased, beyond a certain limit it will not have any further impact on the aspect of reliability. Further Hinkin (1995) also states that proper scale length will minimize a host of response biases, and guaranteeing internal consistency. Based on these studies all required safeguards were taken to maintain the length of the scale at a fair length. 10 items where thus pooled after doing away with double barreled type questions. Another important area that requires care and caution is In order to have face validity, the items were presented in clear, well-organized, and in a manner understood by the respondents.

Scaling is an aspect that requires the exercise of care and caution. Hinkin (1995) opines that a scale must have the quality of generating the required variance between respondents so that statistical analysis is possible. Lissitz & Green (1975) states that the Coefficient alpha of Likert-type scales normally increase up to five points. However, after this it could level off. Based on this a five point scale (strongly agree, agree, neutral, disagree and strongly disagree) was used in this study. In addition to this scale, the biographical blank sheet was also used in the study to gather the information pertaining to age, gender, marital status etc.

Care has also to be exercised while deciding on the sample size. This is all the more important when Factor Analysis has to be done. In this regard Schwab (1980) identified item-to-response ratio of 1:10. As against this Rummel (1970) stated a requirement of 1:4 and Hoelter (1993) 200. Taking a mean view of these studies the present study collected data from 120 samples.

The tool used in the present investigation was in English language, which was translated into Arabic. The reason behind to translate the questionnaire was to make the respondents understand each item systematically with meaningfulness, and to avoid biases. The researcher took the permission from the company to administer the questionnaire to their employees in advance. Clear instructions were provided to the subjects so as to avoid any confusion with the items. Moreover, the researcher also assured the respondents that the responses would be used for academic purposes and would not be revealed to any higher official at any circumstances. The demographics of the respondents are presented in the following sections (Table 1, Table 2, Table 3).

Table 1. Age profile of the respondents

Categories	Frequency	Valid Percent
18-25 years	36	30.0
26-30 years	33	27.5
31-35 years	30	25.0
36-40 years	12	10.0
41-50 years	6	5.0
51 years and above	3	2.5
Total	120	100.0

Table-1 shows age categories of the employees working in two different sectors. Out of 120 employees 30% employees fall under the age categories of 18-25 years, 27.5% respondents were in the 26-30 years categories, 25% respondents observed in the case of 31-35 years groups, having 6 respondents in the age categories of 36-40 years which constitutes 10% respondents and 51 years and above contains only 3 respondents with 2.5%.It is observed from the table that most of the employees employing in the company were younger in age and fewer were in older in age groups.

Table 2. Marital status of the respondents

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Categories	Frequency	Valid Percent
Married	78	65.0
Unmarried	42	35.0
Total	120	100.0

It can be seen from the table 2 that 65% employees were married (N=78) whereas, unmarried (N=42) were 35%. The findings revealed that some of the employees were unmarried in the age groups between 18-40 years which constitutes the 92.5% of the respondents.

Table 3. Work experiences of the respondents

Categories	Frequency	Valid Percent
1-5 years	57	47.5
6-10 years	48	40.0
11-15 years	9	7.5
16-20 years	6	5.0
Total	120	100.0

From the aforesaid table 3, it is observed that most important experience categories are between 1 to 5 years which consists of 47.5% respondents followed by 6-10 years which consists of 40% respondents. 11-15 years experienced groups are having 7.5% respondents, whereas, only 5% respondents shows in the 16-20 years of experience of categories.

Tool refining

A variety of statistical techniques are found used for tool refining and purification. The most frequently used techniques are inter-item correlation and Factor analysis (Boyle, 1991; Henson and Roberts, 2006 Hinkin, 1995, 1998). This method has been used by a number of earlier studies (Sulphey and Nisa, 2014; Sulphey, 2015). The present study used both these. According to Boyle (1991) items have to be eliminated if the inter-item correlations exceed .7. According to him "this could help in avoiding too much redundancy and artificially inflated estimates of internal consistency". Based on this no items were eliminated from the pool.

Thereafter Factor analysis was done. The principal component axis method and Varimax rotation with Kaiser Normalization was conducted. The rotations converged at three iterations. Qualification criterion, according to Hinkin (1995) for the judgment factor loading is .40. Since all the items had factor loading value of over .40 no items warranted exclusion. The analysis provided two factors. The details are presented in Table 4.

Table 4. Items and factor loadings

No	**Item**	**Factor loading**	**Item to total correlation**
	Factor 1		
1	Job analysis practices	.603	.577**
2	Recruitment and selection practices	.627	.769**
3	Training and development	.917	.564**
4	Performance appraisal	.615	.882**
	Eigen value	6.45	
	Per cent of variance explained	64.49	
	Cronbach Alpha	.804	
	Factor 2		
1	Compensation and benefit	.889	.895
2	Working conditions	.866	.907

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3	Security and health	.750	.757
4	Communication practices	.829	.859
5	Peer relations	.860	.883
6	Intention to stay	.900	.828
	Eigen value	1.10	
	Per cent of variance explained	11.03	
	Cronbach Alpha	.949	

Reliability

Some of the ways in which reliability is assessed are inter-item correlations, Cronbach Alpha and Split-half (Hinkin, 1995). According to Hair et al. (2006) the rule of thumb for inter-item correlation is that it should exceed 0.50. Cronbach Alpha is another method used for internal consistency reliability, for which the suggested **α** is .70 (Nunnally, 1978). In the present case both the factors had **α** values over the stipulated minimum of .79 (Table 4). Kumar & Beyerlein (1991) suggests that a high **α** value would suggest the consistent responses for all the items by the subjects. The factor wise items-to-total correlations also suggest high internal consistency reliability (Hair et al., 2006), for both factors. These findings suggest a high reliability of the tool. The scientific construction of a tool to assess unfair HR practices has succeeded in providing a further impetus for further research in this area. It is hoped that this tool will stimulated further researches about unfair HR practices.

The study also intended to find out the level of perceived unfair HR practices among private telecom employees of KSA. Towards this the sample was classified into three groups based on the following grouping:
Those having total score above Mean + ½ Standard deviation :: High
Those having total score below Mean – ½ Standard deviation :: Low
Those samples having scoring between the above two scores were classified as medium group. Thus those having scores over 31.20 were considered as high group and below 22.69 as low group. Those having scores between 31.20 and 22.69 were of the medium group. Based on this the distribution of the sample was as under (Table 5).

Table 5. Classification of the sample

No	Grouping	Number	Per cent
1	High group	36	30.0
2	Medium group	33	27.5
3	Low group	51	42.5
	Total	120	100

From the table it can be seen that 30 per cent of the sample (36) perceived that their organizations had unfair HR practices. It is however, heartening to note that 41 (42.5 per cent) of the sample perceived that their organization is not having any unfair HR practice. Those in the medium group numbered 33 (27.5 per cent). Those in the medium group could on a later stage, based on their change in attitude have the propensity to move to either high or lower group.

It was another objective to examine if there is any relationship between perceived unfair HR practices and the various demographics of the sample. The details are presented in Table 6.

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Table 6. Data and t-value based on marital status

Marital status	Number	Mean	SD	t-value
Married	78	27.78	9.25	1.492NS
Unmarried	42	25.36	6.85	

Note NS: Not significant

The results of the t-test show that there is no significant difference between married and unmarried employees regarding their perception about unfair HR practices. However, the mean value of married is found to be higher denoting that they perceive that their organizations had unfair HR practices. This may be due to the higher demands of married people with respect to their specific needs due to their marital status.

An attempt was made to find out if there existed any difference between the samples regarding their perception of unfair HR practices in their respective organizations based on age. Towards this ANOVA was done and the results are presented in Table 7.

Table 7. ANOVA Results based on demographics

Based on age				
	Sum of Squares	**Df**	**Mean square**	**F**
Between groups	3035.841	5	607.168	12.273*
Within groups	5639.696	114	49.470	
Total	**8675.467**	**119**		
Based on family size				
Between groups	418.145	2	209.072	2.962 $
Within groups	8257.322	117	70.575	
Total	**8675.467**	**119**		
Based on qualification				
Between groups	1403.800	4	350.950	5.550*
Within groups	7271.667	115	63.232	
Total	8675.467	119		
Based on experience				
Between groups	294.182	3	98.061	1.357 $
Within groups	8381.285	116	72.252	
Total	8645.467	119		

Note: * Significant at 0.01 $ Not significant

The Analysis of Variance has provided some very interesting results. It shows that while there are significant differences in the perception about unfair HR practices with respect to Age and Qualification, no significant difference was found with respect to family size and experience. This result is to a certain extend intriguing, especially the findings regarding age and experience of the respondents.

5. Conclusions

This particular research conducted on employees working in private telecom sectors in the Saudi Arabia to explore the understanding of fair or unfair HRM practices. Large number of studies have been conducted on the theme HRM practices on the globe but rarely seen by the researchers initiated a study pertaining to unfair HRM practices. Thereby, the aim of the was to explore the attributes of unfair HRM practices existing in the private telecom sector in K.S.A. 30 per cent of the sample (36) perceived that their organizations had unfair HR practices and 41 (42.5 per cent) of the sample perceived that their organization is not having any unfair HR practice. Albeit, 27.5 per cent were in medium group and those medium group could change the attitude in the later stage towards either higher or lower group. This indicates that unfair existed in the sector. Further the result showed no

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significant difference between married and unmarried employees but married employees mean scores are high indicating unfair HRM practices is prevailing in the company.

6. Suggestions and limitation of the study

It is observed from the findings that private telecom company in the Kingdom have overall fair HRM practices but unfair also existed in a marginal level. As noted by Guest (2011) that success or failure of HRM practices implementation depends on manager skills and ability. Hence, it is the responsibility of the manager to provide clear job description, adequate training, fair recruitment and selection, security and health practices working condition, well-planned performance appraisal system etc. in the organization to motivate them to perform in an extraordinary manner and to eliminate unfair practices. This research paper has certain limitation like other empirical research. This particular study initiated only on male and small sample size so findings cannot be generalized across the population. It would be better to take adequate sample and different population to make the study more informative to the audience. Finally, the study sparked some new value to the knowledge of study to know the consequences of unfair HRM practices in the telecom sector in the Kingdom.

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DARK TRIAD CHARACTERISTICS BETWEEN ECONOMICS & BUSINESS STUDENTS IN CROATIA & SLOVAKIA: WHAT CAN BE EXPECTED FROM THE FUTURE EMPLOYEES?

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Abstract. This paper deals with the "dark triad" personality and its components (Machiavellianism, narcissism, subclinical psychopathy) on economics & management student population in Croatia and Slovakia. Dark Triad represent important HRM area in which is trying to understand the "dark" side of human functioning which has potentially harmful impact on organization functioning and performance. Population of economics & management students is important in the context of HRM because of their future high potential to generate dysfunctional organizational behaviors, when they will be organizational employees, especially on management positions. The goal of this research was to gather the data about dark triad personality phenomenon, make the comparisons between Croatian and Slovak sample, present the potential organizational impact of employees with dark characteristics in organizational context and show the implications for HRM. For measurement of the dark triad components (variables) it is used questionnaire measurement that adopts the standardized short dark triad measurement instrument of Jones & Paulhus. Results of the Croatian students are compared with the results of Slovak students, and basically also with Canadian student sample. The basic results showed that 6% Croatian and 0.5% of Slovak economy & management students showed full dark triad profile, also there are found very significant statistical differences in the Machiavellianism and subclinical psychopathy variables between the Croatian and Slovak samples, i.e. these characteristics were statistically higher in Croatian sample.

Keywords: Dark triad (Machiavellianism, narcissism, psychopathy); HRM; management; comparative analysis; Croatian; Slovaks

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JEL Classifications: M12, M5

Additional disciplines: psychology; sociology; law

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1. Introduction

For organization and management is important to know every factor which create optimal conditions for increasing the efficacy of working force/employees. In such a context employers and HRM professionals are interested to know which desirable characteristics employees should have, and what to do if they do not have such desirable characteristics, or what to do when they even have negative, e.g. dark triad characteristics. From the important characteristics, which had important impact on working behavior in organizations, meta-analytic researchers showed that personality is moderately strong predictor in solving working tasks (e.g. intelligence is a very strong predictor), whilst motivation mechanisms moderates between personality traits and working performance (Barrick & Mount, 1991; Siller & Cibak, 2016). But, it is also showed that it is very important to understand "dark side" personality which can have significant (mostly negatively) impact in organizational context. Therefore, the interest of researchers in the last ten years shifts from the bright side employee's personality (e.g. five factor personality model - "Big five" relates to the independant personality traits: neuroticism, extroversy, oppeness, compliance, conscientouous (Lee & Ashton, 2005) to the dark side personality (cf. Baboselac-Marić, 2015). Also, it is important to note, that in any organization reality there is no organization that doesn't embody some form of pathology (Hawley according to Lučić, 2013).

This organizational pathology arises because of negative workplace behavior whose source is mostly in personal traits (e.g. dark triad traits). Namely, the strongest predictor of an employee's behavior (in general and in organizational sense) is his/her personality. So, personal traits as integrity, authenticity, and optimism support positive behavior and positive outcomes, while negative personal traits are associated with negative workplace behaviors (O´Boyle et al., 2012). Negative or counterproductive work behaviors like theft, leader derailment, organizational politicking, mobbing, manipulation, sadism, etc. can have deleterious consequences for organizations in terms of organizational outputs such as performance, profit, and reputation. Dark triad personalities are more prone to do such criminal and/or unethical behavior. So for HRM is very important to understand the dark side of personality which reside in the area between normal personality and clinical pathology (defined disorder in psychiatric classification of DSM-IV) (Spain, Harms & Lebreton, 2013), because of the fact that the components of dark triad relates on this what is consider as normal i.e. subclinical level (abnormal is treated in term „clinical" which depicts persons which are in clinical or forensic treatment/surveillance and term „subclinical" relates to „softer version" and cover broader span of behaviors and functioning in the population). In such a context the approach to the subclinical traits of personality is called Dark Triad which has the impact on research in the area of normal personality by aberrant/dysfunctional/maladaptive patterns of organizational behavior and functioning (Paulhus & Williams, 2002).

1.1. Concept of Dark triad and "toxic triangle" in organizational settings

Defined in most simple way dark triad is the combination of predispositions which include non-sensitiveness (for others) and covetousness, and relate to the model of behavior by which is taken the advantage over others, exploitation the others because of his selfish interests (Jones & Paulhus, 2011). Dark triad with components: Machiavellianism, narcissism and subclinical psychopathy (Paulhus & Williams, 2002), is based on malevolent character and social behavior which goal is to promote himself whereat is making the damage to others. Psychopathy, narcissism and Machiavellianism are three personality types which, in isolation, are bad enough, but in combination are utterly toxic. The dark triad is the set of three personality constructs considered to be socially aversive: subclinical psychopathy, Machiavellianism, and subclinical narcissism (Paulhus & Williams, 2002), so the dark triad is the term used to describe the combination of these three dark traits (Plumridge, 2013). They can be characterized by a lack of empathy, a willingness to manipulate others (for self-betterment), antagonism, and a

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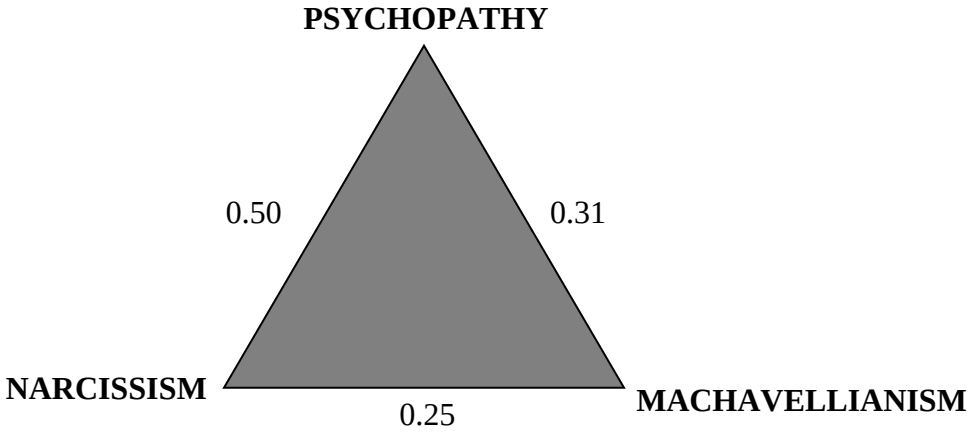
belief in one's own superiority (Paulhus & Williams, 2002). What do these three toxic personality traits represent?

Machiavellianism indicates a manipulative personality. Machiavellians overtly manipulate and exploit people for their benefit. Machiavellians have cynical disregard for morality and engage in deception. They are skilled in negotiating and enjoy combat. They are good in forming political alliances, influencing others for their own gain, using flattery or deceit; if necessary, they use subtle skills to gain influence. But they can also be charismatic leaders and forceful negotiators. They can be creative because they often enjoy testing limits.

Narcissism characterizes individuals/personalities who want to become the center of attention, seek prestige, who are characterized by grandiosity, entitlement, dominance, superiority and status with egotism that knows no bounds. They use appearance, ingratiating tactics, and phony compliments to get what they want. They are often skilled at making a good first impression, and people who can engagingly tell stories and impress others. Because of that behavior, they are at least initially respected and put in positions of authority and command by others.

Psychopathy indicates antisocial personality which is impulsive, thrills seeking, aggressive, tends towards antagonism and lacks remorse and empathy. People look like hostile, harsh or arrogant; they can also be sadistic. They think rules don´t apply to them. But they get their way through their superficial charming manner but also they tend to think creatively, testing the limits. They are also skilled manipulators (forming political alliances). They tend to focus on short-terms benefits for themselves rather than long-term results for their organization (Malnick, 2013; Plumridge, 2013; Jonason et al., 2012; Jones and Paulhus, 2012; O´Boyle et al., 2012; Yatzeck, 2012). The dark triad scheme with correlations between its basic components is presented in the picture 1.

Picture 1. The Dark Triad with the relationships between the components of dark triad



Source: McHoskey, Worsel & Szyarto, 1998 (intercorrelation between narcisism and psychopathy, intercorrelation bethween psychopathy & Machiavellianism); Paulhus & Williams, 2002.

As can be seen from the picture all three components have some empirical overlap (Furnham, Richard & Paulhus, 2013). A person who shows consistently high results of narcissism i.e. ruthless self-promotors shows also high results on psychopathy (Gustafson & Ritzer, 1995). But the difference between narcissism and psychopathy is in the love and deeper emotions (narcissists would like to change his personality to receive love from others, subclinical psychopaths no, because they are not able for love, deeper emotions, so consider that there is not needed their personality change) (Boddy, 2011). Narcissism correlates negative with the need for intimacy (Jonason & Krause, 2013). Machiavellianism construct is developed in 1970 (Christie & Geis, 1970), is positively

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connected with psychoticism and extraversion (Allsopp, Eysenck & Eysenck, 1991 according Corral & Covette, 2000), with paranoia and narcissism (McHoskey, Worzel & Szyarto, 1998), negatively connected with the trait complacence (Jackobwitz & Egan, 2006; Paulhus & Williams, 2002), and consciousness (Baboselac-Marić, 2015). The weakest relationship is between Machiavellianism and narcissism but it exists, because those high in Machiavellianism more often talks about himself in superlatives and negatively on the others. According to Furnham (2010), three interrelated features of the dark side are:

1. Arrogance, self-centeredness, self-enhancement;
2. Duplicitousness, cynism, manipulativeness;
3. Emotionally cold, impulsive thrill-seeking and frequently engage in illegal, dangerous, anti-social behavior.

Dark side managers cheat and lie; they plagiarize and are known for their social deviance, but it is usually never extreme enough to warrant either imprisonment or even dismissal (Furnham, 2010). When organizations have manager(s) who score high on combined psychopathic, Machiavellian and narcissistic tendencies, it can be recognized by the following behaviors (Malnick, 2013):

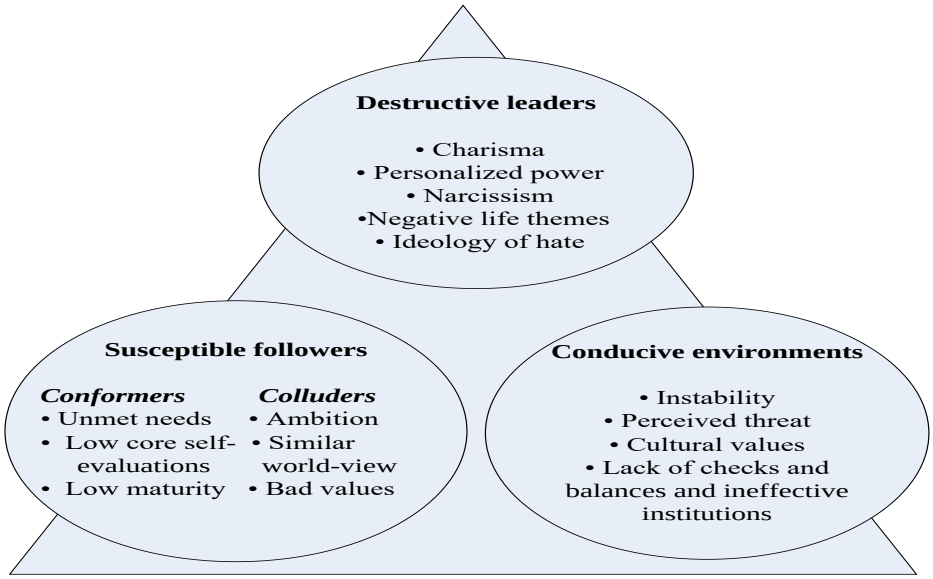
1. They tend to exploit and trick others for self-advancement.
2. They have used lies and deception to get their way.
3. They have used ingratiation to get their way.
4. They tend to manipulate other for selfish reasons.
5. They tend not to feel regretful and apologetic after having done wrong.
6. They tend not to worry about whether their behavior is ethical.
7. They tend to be lacking in empathy and crassly unaware of the distress they can cause others.
8. They tend to take a pretty dim view of humanity, attributing nasty motives and selfishness.
9. They tend to be hungry for admiration.
10. They tend to want to be center of attention.
11. They tend to aim for higher status and signs of their importance.
12. They tend to take it for granted that other people will make extra efforts to help them.

All three constructs of the dark triad are high in striving for autonomy and superiority (agency) and low in connecting with and helping others (communion), and all three are high in ruthless self-advancement (Zuroff et al., 2010). Psychopaths score high on the impulsivity dimension; narcissism stands apart on the axis of superior identity (i.e. self-enhancement). For narcissism, the strongest associations are with low modesty and low straightforwardness, whereas psychopathy associations are strongest with low deliberation and low dutifulness.

The strongest correlates of narcissism are achievement-striving and competence, whereas the strongest correlates of psychopathy are low dutifulness and low deliberation (Furnham, Richardson & Paulhus, 2013, p. 203-204). Further, all three dark triad constructs are positively correlated with lying, dominance and sadism (Bradlee & Emmons, 1992; Chabrol & al., 2009). Dark triad traits help people “get ahead” of but not necessary “get along” with others at work (Furnham, Richardson & Paulkus, 2013, p. 206). For destructive organizational climate bad leaders are often not enough but they need followers which “conspire” with the bad leader and particular situation. The “toxic organizational triangle” is presented in picture 2.

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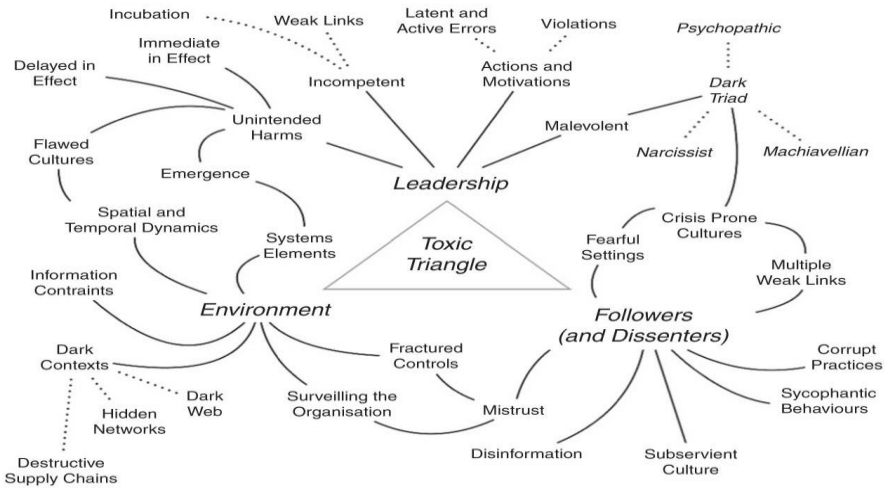
Picture 2. The toxic organizational triangle: elements in three domains related to destructive leadership in organizational setting



Source: Furnham (2010)

In picture 3, we present a more complex picture of the toxic triangle surrounding dysfunctional leadership and organizations where dark triad personality traits have an important place.

Picture 3. Elements of the organizational toxic triangle surrounding dysfunctional leadership and organizations where dark triad personality traits have an important place



Source: Fisherbacher-Smith, (2015)

Although the picture of the toxic organizational triangle seems very complex it is important to understand this organizational phenomenon because dark triad personalities are utterly toxic for organizational culture/climate and can produce very bad organizational outcomes (even the "death of the organization"), so is very important to

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familiarize with it not only to understand it but also to deal with it in order to improve organizational HR functioning.

1.2. Impact of dark triad on organization and organization efficacy

Managers and other employees who score high on the dark triad (toxic employers) use hard (e.g. threats) and soft tactics (e.g. offering compliments or joking/kidding) to manipulate the person and the situation (Jonason at al., 2012). Namely, psychopathy in a work setting was related to the use of charm and coercion, Machiavellianism was related to the use of charm and seduction, and narcissism was related to invoking feelings of responsibility in others. Specifically, psychopaths and Machiavellians use direct and hard manipulation such as the use of threats, whereas narcissist and some Machiavellians employ softer methods of exploitation such as using compliments to ingratiate themselves with their fellow employees and then asking for "favors" (Black, 2013). Whereas narcissist claim to use soft manipulation tactics, psychopaths choose hard tactics, Machiavellians are the most flexible and use both soft and hard tactics. Dark triad is considered to be especially harmful when the organization is given the positional power of the individuals concerned and are typified by a "systematic and repeated behavior by a leader, supervisor or manager that violates the legitimate interest of the organization by undermining and/or sabotaging the organization's goals, tasks, resources, and effectiveness and/or the motivation, well-being or job satisfaction of subordinates" (Einarsen at al., 2007). A bad, toxic or pathological organizational situation is caused by the employees; it is real and it is dangerous, especially if it is present in management or business leadership. In fact, 1% of normal people could be classified as psychopaths, rising to 4% in CEO´s and business leaders, and 15-25% of male offenders in federal correctional settings (Black, 2013; Chopra, 2013; Yatzeck, 2012). In 2008, it was estimated that 6.2% of the population met the DSM-IV-TR criteria for narcissism (Black, 2013). Individual studies found that narcissists in positions of power often engage in unethical behavior, psychopaths are a detriment to a company´s productivity and are poor at cooperating with colleagues, Machiavellians are abusive and manipulative within the workplace and have demonstrated a diminished organizational commitment and poor supervisory responsibility (Black, 2013).

For HRM is important to know the relationship between dark triad and work performance. A meta-analysis of 43.907 articles published about dark triad individuals in the workplace between 1951 and 2011 revealed that job performance was negatively related to Machiavellianism and psychopathy, and the possession of all three dark triad traits in employees was moderately related to bad productivity in the workplace (O'Boyle at al., 2011). In organizational settings, one or more of the dark triad personalities have counterproductive behavior. They are evident in the notions of "toxic leadership", "snakes in suits", "bad bosses", "shark-managers". The same applies to non-leaders as well. The examples of organizational settings where high levels of dark triad traits combined with other factors such as intelligence or physical attractiveness (which often help an individual acquire positions of leadership) are also known. Toxic employees, as embodied by the dark triad traits, represent problems for any company/organization, supervisors, and fellow employees. This includes disintegration of teamwork performance and of organizational effectiveness (Boddy, 2015). Because leaders unite, direct, and coordinate people to achieve a goal, destructive leaders can be extremely dangerous (in interactions with followers and conducive environment, they can even destroy organizations), so it is important to learn how those employees (managers and others) who score high on the dark triad traits behave at work, and what preventive measures to be taken. The empirical evidence in transition organizations and economies has shown that bad management/leadership which can be at least attributed to the dark triad personalities (Machiavellianism, narcissism, psychopathy) is responsible for bad organizational and socio-economic results. For example, in "big business" just the cases of Enron, Lehman Brothers, Worldcom, Freddie Mac, Bernie Madoff, and plenty of other multibillion dollar fraud cases have drawn the attention of the public and researchers to the Dark Triad traits, and negative consequences of such traits in the workplace (Jonason et al., 2015). For organizational success, it is extremely important to have management/business leadership without such pathological personalities. Components of dark triad relate to

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weaker self-control, manipulative behavior in organizational settings, and that persons with these characteristics are in the "grey" zone of "toxic employees" or "rotten apples" (Penny & Spector, 2002; Robinson & O'Leary-Kelly, 1998 according Jonason, Wee & Li, 2015). Therefore, it is very important to make steps toward knowing and preventing and reacting on the dark triad personalities and such behavior especially by management/business leadership.

1.2.1. Machiavellianism in the organizational context

Persons who are prone to Machiavellianism express job satisfaction when they consider that they are doing high prestigious and jobs with high authonomy (Jonason, Wee & Lee, 2015). But when they are working in high competitive conditions they report about general job dissatisfaction. So, competitive persons have tendencies to choose less competitive environment to be satisfied on the job but in the same time perceive that the competition is always and everywhere present. Machiavellianism shows strong connectivity with counter-productivity working behavior (Dahling, Whitaker & Levy, 2009), and the persons prone to Machiavellianism report about lower level of job satisfaction and perceives more stress on the job. The same authors think that this lower job satisfaction and higher stress has his source in their constant effort for awards and approvals and control of others. Machiavellians perceives the world around them as competitive and this perception is in the function of the approach oriented on the power. They show a lack of empathy, social interests and prosocial behavior. They think that it is wise to talk to the people what they want to hear, that people are unfair, without honesty/integrity and that to them can't be belived (McHoskey, Worzel & Szyarto, 1998). By their behavior of "social chameleons" they can build strong social network in the organization, acquire the trust of coworkers and can produce the desirable outcomes, until the mask of manipulation is not recognized. When manipulation behaviors are recognized, most often by intelligent coworkers their impact weaken and can produce organization dis-cohesion and negative organization results (Bogdanović, 2016).

1.2.2. Narcissism in the organizational context

Narcissism is described as behavior directed to himself-admiration, praise himself, self-adoration ("ego" in Freuds terms) and such affinity relates to non-ethical organizational behavior and need for power (Rosenthal & Pittinsky, 2006 according Jonason, Slomski & Partyka, 2011). Although some level of narcissism is needed for normal functioning because it makes balance between foreign and his own needs, extreme subclinical narcissism behavior can have negative impact on organization in terms of team work (cooperation/collaboration). Namely although narcissist are not necessarily unproductive they are often negatively perceived from their working environment (O'Boyle & al. 2012). Narcissism affinity obstruct teamwork and disable cooperative behavior, although narcissism persons see himself as very positive, others perceive them as non-cooperative and aggressive. Narcissism persons believe that they are better than the others, that they deserve more respect and admiration of others, can be extremely vanish, arrogant, have exaggerated feeling for "their rights" (Cale & Liliefeld 2006 according Boody, 2011), in the leader role overestimate their efficiency and underestimate the efficiency of other employees (Judge, LePine & Rich, 2006). High level of narcissism in organizations relate to general dissatisfaction (Koppelman & Mullins, 1992). So it is to consider that narcissistic persons have strong feeling of inferiority so they can't be satisfied with their life. As indicator of poor working performance of narcissism employees can be the negative correlation with empathy and consciousness (Paulhus & Williams, 2002; Barrick & Mount, 1991). Persons with high narcissism in the working environment often do not satisfy their needs, what is also suboptimal for the organization in terms of their lower motivation.

1.2.3. Subclinical psychopathy in the organizational context

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Persons with subclinical psychopathy are exclusively focused on achievement by which they are not embarrassed by the empathy or possible victims (sacrifices) which are the results of such motivation. Subclinical psychopathy can bring to the lower level of organizational responsibility and have negative impact on productivity (Boddy, 2010 according Jonason, Slomsky & Partyka, 2011). Some research confirmed the connection of psychopathy with low level of consciousness (Miller & Lynam, 2003). Because of higher level of impulsivity, they work weaker than the others. Their impulsive behavior often can be destructive, so by such a person is increased the affinity to fake and sabotage (O'Boyle & al., 2012). High level of boredom make them prone to risky activities, they do not respect the rights of other people, very often they do not respect deadlines, are careless and consider that most of their responsibilities are not their responsibility. Psychopathy is in the most extent connected with violence and aggressive behavior, to them is not important that the coworkers accept them, and they do not endeavor to establish good relationships with others. So subclinical psychopaths are not at all a good solution for any organization.

1.3. Research purpose and goals/problems

This research has a purpose to achieve the greater awareness of the dark triad organizational problem, with an emphasis on organizational measures to prevent and diminish it. The first step is the organizational diagnosis (recognition) of such behavioral traits and then providing the measures (preventive and reactive) against such pathological organizational behavior. This research is a step in eliminating/diminishing such a problem in organizations. The main aim of this research was to explore the dark triad personality traits of the economic & management student population in Croatia & Slovakia, compare them, and also make the comparison with the Canadian students (as control group) and to propose basic measures to reduce the dark side´s effects in the organizational future. The research problems are defined as follows:

A) To identify the items from the Croatian & Slovak sample that have high values in dark management triad component variables (Machiavellianism, narcissism and subclinical psychopathy) according the criterion made on Canadian student sample (N=387) from research of Jones & Paulhus 2012.
B) To compare the deviant management scales (Machiavellianism, narcissism and subclinical psychopathy) between the Croatian sample (N=150), Slovak (N=185) and the Canadian sample (N=387) from the research of Jones & Paulhus (2012).
C) To examine how much persons, have potential harmful Machiavellianism, narcissism and subclinical psychopathy and extremely harmful whole psychological Dark side profile (very high level of Machiavellianism, narcissism and subclinical psychopathy) in Croatia & Slovakia.
D) To examine if there is a statistically significant difference in the variables of Machiavellianism, narcissism and subclinical psychopathy between male and female management students, also between students who works during the study with students who do not work during their study also, in the Croatian & Slovakian sample.

Finally, the goal of this research is to discuss the possible causes of obtained results on the Croatian & Slovak sample and give practical implications for HRM and general organizational management how to deal with dark side´s personalities in order to avoid or diminish their potential future negative effects in organizations. This research use known short dark triad measurement instrument and methodology which is similar to the way of research which performed the other authors e.g. Malesza at al. 2017; Jones & Paulhus, 2012; Paulhus & Jones, 2011; Jonason & Webster, 2010; Paulhus & Williams, 2002.

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2. Methodology

Because there is little evidence on the "dark triad in business" and deviant organizational behavior and deviant values (virtues) in transition economies i.e. Croatia & Slovakia, the authors consider that such topic (although interesting and for management and organizations very relevant) can be treated as a new line of research. This work has its foundation in a sample of economics & management students from the Faculty of Economics at the University of Split in Croatia – hereafter referred to as Croatian sample, and economy and management students of Faculty of Economics University Matej Bel in Banska Bystrica, Slovakia – hereafter referred to as Slovakian sample. The goal was to research and to compare the frequency of "dark management triad" (variables Machiavellianism, narcissism, psychopathy) of these two samples (Faculty of Economics at the University of Split, which hosts about 4.000 students and Faculty of Economics Matey Bel University in Banska Bystrica, Slovakia which host about 3.000 students) which also educates future management professionals. The Canadian sample (basically referred by researcher Jones & Paulhus 2012; 2014) is treated as control sample. The benefit of such type of research is that it can forecast the future economic efficiency of such human resources, and prevent the possible bad economic outcomes in different types of organizations.

2.1. Measurement instruments

The traditional measures of the Dark Triad together require approximately 100 traits, so when time is limited and can cause fatigue by the several participants researchers can use a brief measure (Gosling, Rentfrow & Swan, 2003) which can be useful. In this research so it is used the Short Dark Triad to measure the dark personalities. This 27-item instrument has been employed successfully by a number researchers (e.g. Arvan, 2011; Baughman et al., 2011). The short dark triad questionnaires (Jones & Paulhus, 2012; 2014) has nine items of Machiavellianism, nine items of narcissism and nine items of psychopathy. The dark triad questionnaire used the five degree Likert scale. The original questionnaire is attached in the appendix. For the purposes of the research on the Croatian population sample, the basic questionnaire was translated into Croatian, and for Slovak sample it was translated on Slovakian. The descriptive statistics of the questionnaire on the Canadian student population (N=387) is presented in table 1 and table 2.

Table 1. Psychometric norms for dark triad variables

	Mean	**S.D.**	**Alpha**
Machiavellianism	3.1	.76	.78
Narcissism	2.8	.88	.77
Psychopathy	2.4	1.0	.80

Source: Jones & Paulhus (2012)

From the presented norms, it can be seen that all three variables (Machiavellianism, narcissism and psychopathy) have good reliability (Cronbach Alpha for all the three variables was between 0.78-0.80).

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Table 2. Intercorrelations between the main three dark triad variables

	Machiavellianism	**Narcissism**	**Psychopathy**
Machiavellianism	--	.23	.37
Narcissism		--	.20
Psychopathy			--

Source: Jones & Paulhus (2012)

The dark triad measurement instruments exhibited a relatively low degree of intercorrelation (e.g. the intercorrelation between Machiavellianism and narcissism here was much lower than in previous research of Paulhus & Williams 2002 presented in picture 1., so we can conclude that this newer measurement instrument is improved and better measure the construct components), so it can be considered that the dark triad variables are rather "pure", not only conceptual but also empirical concepts. Some of the past studies suffered from measurement issues, i.e. empirical overlap; for example, subclinical psychopathy and narcissism loaded on the same factor (Furnham & Crump, 2005, Furnham & Trickey, 2011; according to Furnham, Richards & Paulhus, 2013, p. 202).

Interesting correlations presented between Dark triad measures (measured with short dark triad measurement instrument like is done in this paper) found the research on larger sample (N=913) German adolescents. Although the sample of adolescents (13-18 years) are not the same with adult samples of young students (18-23 years) from the table 3. can be seen the main empirical characteristics (quality) of this measurement instrument.

Table 3. Convergent correlations between traditional three measures of the Dark Triad and Short dark triad measures

	SHORT	DARK	TRIAD
Standard measures	Machiavellianism	Narcissism	Psychopathy
SRP III-Manipulation	.58**	.39**	.67**
SRP III-Callous Affect	.49**	.24**	.58**
SRP III-Erratic Lifestyle	.33**	.34**	.59**
SRP III- Antisocial Behavior	.19*	.20*	.61**
NPI-Leadership/Authority	.35**	.51**	.49**
NPI-Exploitative/Entitlement	.26**	.49**	.38**
Mach IV-Machiavellian Tactics	.52**	.31**	.52**
Mach IV-Cynical Worldview	.55**	.11	.33**

Source: XY, forthcoming, under revision

SRP-III = Self-Report Psychopathy Scale-III; Mach-IV = Machiavellianism Scale; NPI = Narcissistic Personality Inventory; *p < .05; **p < .001.

It can be concluded that short dark triad measure instrument is very good measurement instrument although it has some empirical overlaping in constructs content, e.g. Machiavelians and Psychopaths both were similar in the facet of Manipulation (r=0.58 vs r=0.67) and Machiavelian Tactics (r=0.52 vs r=0.52). Narcissist were similar with Psychopaths in Leadership/Authority (r=0.35 vs 0.49) and Machiavellianist ware very similar with Narcissist in the facet of Erratic lifestyle (r=0.35 vs 0.34). Similar results on adult German population with the same measurement instrument found also other

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researchers (Malesza at al., 2017) hence can be concluded that measurement was conducted with appropriate, high-quality measurement instrument.

2.2 Data collection

The measurement i.e. data collection was conducted on two samples:
I) on the Croatian sample of N=150 management students in their second year of studies (on the Course Human Resource Management) at the Faculty of Economics, University of Split in Croatia. From a total of N=150 student subjects, 117 were female and 33 males with age differentiation from 20-29 years. Data collection for this sample was in April and May 2015.

II) on the Slovak sample of N=185 management and economy students (151 on the Course Human Resource Management and 34 on the Course Psychological Training) on the Faculty of Economics, University Matej Bel in Banska Bystrica). In this sample 151 students were the students of third year on the Course Human Resource Management, and 34 students were forth year of study (first year of master level study) with age differentiation from 19-24 years. In this sample 151 were female and 34 male students. Data collection for this sample was in April 2016.

2.3. Procedure of data collection

The procedure for two samples (Croatia and Slovakia) was the same. To the students were explained the goals of the research, and they were kindly asked for their approval to be included in this research. Only students who agreed participated in the survey. The questionnaire filling was anonymous and took approximately five minutes. The data processing was conducted in the SPSS statistical package.

3. Research results and discussion

To deal with the first research problem, we identified high values of dark triad items in the Croatian & Slovak sample. The results are presented by the ordered problems (scheduled in the introduction part) i.e.:

A) Identification the items from the Croatian & Slovak sample that have high values in dark management triad component variables (Machiavellianism, narcissism and subclinical psychopathy) as compared to the Canadian sample.
B) Comparison of the deviant management scales (Machiavellianism, narcissism and subclinical psychopathy) between the Croatian sample (N=150), Slovak (N=185) and the Canadian sample (N=387) from the research of Jones & Paulhus (2012).
C) Examination of extremely values in targeted variables i.e. examination how much persons have potential harmful Machiavellianism, narcissism and subclinical psychopathy and extremely harmful whole psychological Dark side profile in Croatia & Slovakia.
D) Examination if there is a statistically significant difference in the variables of Machiavellianism, narcissism and psychopathy between male and female management students, also between students who works during the study with students who do not work during their study, in the Croatian & Slovakian sample.

Finally, there is given the discussion about possible causes of obtained results on the Croatian & Slovak sample and are given practical implications for HRM and general organizational management how to deal with dark side´s personalities to avoid or diminish their potential future negative effects in organizations.

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3.1. Results about the first problem

In purpose to identify the items from the Croatian & Slovak sample which have high values in target component variables (Machiaveliannism, narcissism and subclinical psychopathy) after the defined criterion, is presented the descriptive statistics (arithmetic means and standard deviations) of each item of the dark triad measures in Table 4, and described in three parts:

I) high value items from the variable Machiavellianism in the Croatian & Slovak sample;
II) high value items from the variable narcissism in the Croatian & Slovak sample; and
III) high value items from the variable psychopathy in the Croatian & Slovak sample.

In the following text, *M* denotes the mean, while *s* denotes the standard deviation.

Table 4. Arithmetic means and standard deviations of dark triad items obtained from of the Croatian & Slovak sample

Name of items (Items from No. 1-9 = Machiavellianism; Items from No. 10-18 =narcissism; Items from No. 19-27 = psychopathy)	Mean Croatia	Standard Deviation Croatia	Mean Slovakia	Standard Deviation Slovakia
1. It's not wise to tell your secrets.	4.220	.703	3.6757	.80939
2. Generally speaking, people won't work hard unless they have to.	3.920	.773	2.9784	.94958
3. Whatever it takes, you must get the important people on your side.	3.580	.829	3.2595	.93700
4. Avoid direct conflict with others because they may be useful in the future.	3.360	.914	3.3189	.93304
5. It's wise to keep track of information that you can use against people later.	2.940	1.159	2.6432	1.06947
6. You should wait for the right time to get back at people.	2.900	1.349	2.6703	1.25301
7. There are things you should hide from other people because they don't need to know.	4.260	.846	3.6595	1.05177
8. Make sure your plans benefit you, not others.	3.560	1.172	2.9676	.99947
9. Most people can be manipulated.	3.800	.723	3.2324	.92960
10. People see me as a natural leader.	2.960	.776	2.8108	.81554
11. I hate being the center of attention. (R)	3.400	.897	2.9730	.91742
12. Many group activities tend to be dull without me.	2.780	1.009	2.8216	.85692
13. I know that I am special because everyone keeps telling me so.	2.800	.919	2.7514	.92831
14. I like to get acquainted with important people.	3.500	1.008	3.6919	.83222
15. I feel embarrassed if someone compliments me. (R)	3.240	1.034	3.2757	1.03457
16. I have been compared to famous people.	2.960	1.152	2.7514	.99061
17. I am an average person. (R)	3.460	.924	3.4108	.95205
18. I insist on getting the respect I deserve.	3.560	.901	3.3189	.93304
19. I like to get revenge on authorities.	2.620	1.078	1.8486	.76529
20. I avoid dangerous situations. (R)	3.700	.880	2.7081	1.03272
21. Payback needs to be quick and nasty.	2.400	1.080	2.1622	.93581
22. People often say I'm out of control.	2.280	1.099	2.0973	.87926
23. It's true that I can be mean to others.	2.780	1.208	2.3243	1.00147
24. People who mess with me always regret it.	2.440	1.045	1.7297	.74632
25. I have never gotten into trouble with the law. (R)	3.800	1.418	1.9892	1.18408
26. I like to pick on losers.	2.040	1.284	1.6162	.67466
27. I'll say anything to get what I want.	2.640	1.216	2.0270	.95230

Note: (R) = reversed item
Source: Research results

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From the table 3. and according to the defined criterion we have made the identification of critical (high valued) items of the Croatian & Slovak sample in the parts that have critically i.e. significant higher values in Dark Management Triad as is defined (one standard deviation above the arithmetic mean of basic Canadian sample).

At first glance we observed higher results on the Machiavellianism scale (items 1-9) and there is obvious that every Machiavellian item of Slovakian is lower value than in Croatian sample, but this tell us nothing what is in fact high value in the measured variable. For the criterion (what is significantly/critical higher value) is used the basic Canadian sample treated here as control group/sample (table 1). Because the Canadian sample's mean for the variable Machiavellianism (M=3.1; s=0.76) is a result that falls more than one standard deviation below the arithmetic mean of Machiavellianism (greater or equal to M= 3.86), the values of this item for Croatian and Slovak sample can be considered as high. According to this criterion (one standard deviation above the basic arithmetic mean from the Canadian sample with N=387 measurements), the high Machiavellianism item values of the Croatian sample were:

- 1. "It is not wise to tell your secret" (M=4.22; s=0.70);
- 2. "Generally speaking, people won't work hard unless they have to" (M=3.92; s=0.77);
- 7. "There are things you should hide from other people because they don't need to know" (M=4.26; s=0.86).

Based on these results, we concluded that from the nine items of the Machiavellianism variable, the Croatian students scored higher in three items. Also, the item 9, "Most people can be manipulated" (M=3.80; s=0.72) can be seen as high in the Croatian sample and is somewhat higher than the Machiavellianism mean in the Canadian sample also in Slovak sample (M=3.23; s=0.93). In Slovak sample, there is found no Machiavellianism value in any item that is above defined M=3.86 (one standard deviation above arithmetic mean of Canadian sample) so we have clear difference between Croatian and Slovak sample in items 1, 2, 7 already the item 9. These results direct us to the conclusion that Croatian students scored higher in typical Machiavellianism items than Slovak and Canadian students.

As to narcissism (items 10-18), similarly, we consider a result to be significantly higher if it falls more than one standard deviation above the Canadian sample arithmetic mean (M=2.80; s=0.88), so a significantly high $M_{\text{Narcissism}}$ should be greater or equal to M=3.68. By this criterion, there are no "significantly" high results in any narcissism item in the Croatian sample, and in Slovak sample one narcissism item (14. "I like to get acquainted with important people") was high according settled criterion (M=3.69; s=0.83). Higher Slovak result in this item shows the perceived importance of himself in the terms of important people-so in this way Slovak students may be perceived more narcissism prone.

According to the same criterion, concerning the dark triad component scale of psychopathy (items 19-27), the Canadian sample scores M=2.4; s=1.00, so significantly higher results in the Croatian sample should be the items where $M_{\text{psychopathy}}$ is greater or equal to M=3.40. Such psychopathy items in Croatian sample were:

- 20. "I avoid dangerous situations" (R) (M=3.70; s=0.88) – this means a question about liking dangerous situation (because this is a reversed item).
- 25. "I have never gotten into trouble with the law" (R) (M=3.80; s=1.42) – this means a question about having troubles with the law (because it is a reversed item).

Of the nine items describing psychopathy, two items of the Croatian sample scored higher. In Slovak sample, there was no one item which was at high value according the mentioned criterion (M=>3.40). This is also interesting results and direct us the sources of differences in this two samples (Slovak and Croatian).

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3.2. Results about the second research problem (Comparison between the Dark Triad components between the Croatian and Slovakian sample)

The results of the comparison of the deviant management scales (Machiavellianism, narcissism and psychopathy) between the Croatian sample (N=150), Slovak (N=185) are presented in the Table 5.

Table 5. Arithmetic means and standard deviations for the variables (scales) Machiavellianism, narcissism, and psychopathy on the Croatian and Slovak sample

	CROATIAN SAMPLE N=150		SLOVAK SAMPLE N=185	
	Mean	**Stand. Dev.**	**Mean**	**Stand. Dev**
Machiavellianism	3.615	0.536	3.156	0.468
Narcissism	3.184	0.455	3.090	0.491
Psychopathy	2.744	0.592	2.056	0.495

Source: Research results

To determine whether the results on the scales of Machiavellianism, narcissism and psychopathy are statistically significantly different between the Croatian, and Slovakian samples (from descriptive results in table 4.), we conducted a simple t-tests. The results can be summarized as follows:

a) The Croatian sample has statistically significant higher Machiavellianism than the Slovak sample (t=8.36; df=333; p<0.01). It is interesting to note, that the comparison in Machiavellianism variable between Canadian (table 1.) and Slovak sample was statistically insignificant t=0.92; df=570; p>0.05; and between Canadian and Croatian sample statistically significant t=7.60; df=535; p<0,01. This shows us that Machiavellianism variable values are similar between Canadian and Slovak students, and Croats shows significant higher Machiavellianism.

b) The Croatian sample has not statistically significant higher narcissism than the Slovak sample, i.e. there was no statistically significant difference (t=1.80; df=333; p>0.05). We can note, that the comparison in narcissism variable between Canadian (table 1.) and Slovak sample was statistically significant t=4.18; df=570; p<0.01; and between Canadian and Croatian sample also statistically significant t=5.09; df=535; p<0.01. So it is to conclude that Croats and Slovaks are significantly higher in narcissism, what can be atributed to the different cultural values.

c) The Croatian sample had statistically significant higher psychopathy than the Slovak sample (t=11.58; df=333; p<0.01). Also comparison in psychopathy variable between Canadian (table 1.) and Slovak sample was statistically significant t=4.42; df=570; p<0.01 but in the opposite direction i.e. higher was psychopathy in Canadian sample than in Slovak sample; and between Canadian and Croatian sample also statistically significant t=3.95; df=535; p<0,01 (higher psychopaty in Croatian sample). Here is to conclude that the psychopathy variable is significantly higher in Croatia in both comparisons (Slovakia and Canada), and significantly higher in Canada than in Slovakia. Slovak sample shows here the lowest psychpathy level.

Higher result on Machiavellianism suggest the tendency of exploiting the others and the direction exclusively on himself (Jakobowitz & Egan, 2006). It should be noted that there are several cultural-social determinants of the Croatian sample population which are possible mediators of such results. Manipulative strategies in interpersonal relationships, seeing others as week and liable to influence and the irreverence traditional moral norms (Corral & Calvete, 2000), can be explained by cultural change. For example, a statistically significant high result in a Machiavellianism variable can be explained in terms of increased competition because of the situation of higher and long-term unemployment in Croatia, where economics & management students perceive that the ends are more important than the means, so if they want to succeed, they should behave in a Machiavellianism manner. A possible explanation of the emphasized Machiavellianism values in the Croatian sample is that such behaviors are

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rewarded (Pastuović, 1999) and is clear perceived, that in Croatian society successful people have dominant Machiavellianism personal traits. It should be noted that in Croatia, honesty, justice, integrity and altruism are rarely rewarded in terms of social success. Also, parents and the external environment of examined Croatian students may not internalize in their pedagogy the value model of integrity, truth, love, correct behavior, equanimity, nonviolence, integrity (ethical values), but rather the values of "you should adapt to the current situation".

Also, these days, some Croats are rarely shocked by non-ethical and criminal behavior if they result in material wealth and social prestige. In everyday small talks, it can be heard that some Croatian people would like to have the benefits which come from unethical or even criminal ways, if only they had a chance to do it. This can be illustrated by the fact that one of the former Croatian ministers of finance stated "I would steal under certain conditions!" (http://www.republika.eu/novost/22552/krao-bih-pod-odredenim-uvjetima-ne-sramim-se-toga - „I would steal under some condition, I do not feel shame about this"). The justice system in Croatia does not function very well, and social success is measured by how much common property (social property from the former socio-economic formation) is privatized. The culture in Croatia favors fast wealth making, and Machiavellianism is a good tool to achieve that. So in a culture where the counter-normal Machiavellianism behavior is normalized, it is obvious that the Croatian sample displays somewhat higher Machiavellian values.

Even the Slovaks tends to higher Machiavellianism. It is a result of cultural and ethical transformation of the former totalitarian country into democratic. The early capitalism period in Slovakia (1989-2000) was marked by symptoms of Machiavellianism – the dark and grey economy due to business environment establishment, new phenomenon in national economy – unemployement and relating social issues. Nowadays, the situation in Slovakia is more standard, government is taking actions to reduce corruptions and law enforcement. New rules and values based on fairness and ethic appears in Manifesto of the Government. The Machiavellianism indicators in Slovakia reached the highest values in 1995-2000. New economic and political culture is giving a chance for Machiavellianism reduction in the future.

There was found no statistically significant higher narcissism of Croatian students in comparison with Slovaks, so in these characteristics the samples are similar, although they are higher in comparison with Canadian student sample (M=2.8; s=0.88). Also, the statistically significant higher narcissism of Croatian and Slovak students can be attributed to the genetic (Gattaz, 1981 according Pastuović, 1999, p. 223) and social factors characteristics of this sample. In this work, however, we discuss only the social factors. Narcissism and the feeling of some Croatian people that they are better than others may be internalized by parents' pedagogy, and it can also be the consequence of a national narcissism legend that Croats are more capable, smarter, more beautiful, and stronger (e.g. in sport) than other nations. Narcissism could relate to a defensive mechanism in the situation when the desired goals are not achieved.

Psychologically and culturally Croats are likely to be successful, smart and rich, and the easiest way to achieve it is preferred; i.e. if it is easier to achieve it via narcissism's rationalization approach, then it would be more likely to be used in the population. According to Landes (2003), pride, self-contentment, the paradox of a superiority complex, disdain and underestimation, lack of clarity and manipulation, i.e. narcissistic behaviors, are connected with the culture of economic stagnation, so such statistically significantly higher personality traits in the Croatian sample can be a result of the long-term stagnation of Croatian enterprises and economy.

The Slovak sample higher narcissism can be attributed to the similar explanation as in Croatian. It is a question of historical culture of totalitarian regime. Private property and free market restrictions, full employment, central economy planning and decision making. All these phenomenon leaded within 40 years to empathy reduction, subjection and self confidence disruption. The period after Velvet Revolution in 1989, typical by freedom,

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released emotional potential of Slovaks. New children upbringing patterns based on economical diversion of society, throwing up the traditional values reflected to narcissism of young generation. In a lot of cases we can talk about arrogant narcissistic disorder of young generation. This subtype of narcissism is perceived as by dumping and the surrounding others perceived as hurtful and arrogant, or on the other hand, as a charismatic leader.

Statistically significantly higher subclinical psychopathy of the Croatian sample can be explained by the combination of genetic and social factors of this sample, and can be partially attributed to the higher Machiavellianism and narcissism, because the concepts of the dark triad are not totally pure and they are somehow overlapping (see picture 1. and table 2.). The great deal of psychopathy has genetic reasons (Pastuović, 1999), which are not discussed in this work. A possible genetic marker of psychopathy is HLA-B27 (Gattaz, 1981, according to Pastuović, 1999., p. 223).

Men have statistically higher average results on the psychoticism scale, which indicates a hormonal basis of psychopathy. Other comparative research on kin and non-kin demonstrates a high degree of congenital and inheritance of psychopathy. Psychopaths have difficultly to learn values, and also have a genetic predisposition for antisocial behavior. Psychopaths have a congenital need for strong stimulii, and the best way to satisfy it is by making damage to other persons (Pastuović, 1999, p. 223).

3.3. Results about the third research problem

The results of examination of how much persons (examinees have potential harmful Machiavellianism, narcissism and psychopathy and extremely harmful whole psychological Dark side profile in Croatia & Slovakia is presented in the table 6.

Table 6. Incidence of researched variables in two samples Croatia and Slovakia

	CROATIA			**SLOVAKIA**		
	Man: N/%	Women: N/%	Total: N/%	Man: N/%	Women: N/%	Total: N/%
Machiavellianism M>3,86	23/70%	37/32%	60/40%	8/24%	7/5%	15/8%
Narcissism M>3,68	3/9%	9/8%	12/8%	2/6%	11/7%	13/7%
Psychopathy M>3,40	7/21%	9/8%	16/11%	2/6%	0/0%	2/1%
Dark Triad	3/9%	3/3%	6/4%	1/3%	0/0%	1/0.5%

Source: Research results

From the table 6. can be seen the interesting result in Machiavellianism, i.e. that already 40 % (60/150) of the Croatian sample was high in Machiavellianism, what is much more than in Slovak sample, i.e. 8% (15/185). Also, regarding this variable by the gender in the Croatian sample were already 70% (23/33) males high on Machiavellianism in comparison with 24% (8/34) in Slovak sample. The same domination of Machiavellianism of Croatian sample is present by women, i.e. 32% (37/117) by Croats and 5% (7/151) by the Slovaks respectively. So, it can be seen the clear domination of Machiavellianism in Croatian sample in comparison with Slovak sample. The explanation of such a situation can be the same as it is discussed in the part 3.2. In the narcissism variable, there are not such differences namely it is identified 8% (12/117) by Croats and 7% (13/151) by the Slovaks, and similar situation is present by the gender. Namely, higher narcissism showed 9% (7/33) of Croats and 6% (2/34) of Slovak males, and by women this was 8% (9/117) by Croats and 7% (11/151) by Slovaks respectively.

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But in the variable of psychopathy there is obvious difference between the samples of Croatia and Slovakia. Namely 11% (16/150) of Croats and only 1% (2/185) of Slovaks have higher psychopathy values. As is known that to the psychopathy are more prone males (Pastuović, 1999) this were so also in this research, i.e. 21% of male Croats and 6% of male Slovaks were high in psychopathy and only 8% of Croat women and 0% of Slovak women were high in this variable. The possible explanation of such high result in psychopathy variable by male Croats (very similar as males in penalty institutions where according Black are 15-25%), but also not low by the women (8%) stems perhaps from genetic origin and selection process (namely possible negative selection through longer period, where the best HR was going out of the Croatia are represented in such sample characteristics). Namely it is known the phenomenon that most successful people in some poor societies can be the champions in negative selection (psychopathic and Machiavellianism very prone people), what can be represented in the sample of Croat students.To see what is the frequency of Dark Triad (all three variable components higher value) in this sample we made also this analysis. Although there are little data about this frequency in the literature we can find different data in corporate world (mentioned are between 1 and 5%). This research showed that in Croatian sample were totally 4% (6/150), i.e. 9% (3/33) males, and 3% (3/117) of women, and in Slovak sample totally 0.5% (1/185), 3%(1/34) of Slovak male and 0% of Slovak women, extremely dangerous Dark Triad personality (all the components were significantly high). According to these results, it can be concluded that Croatian organizations will potentially have more problems with Dark Triad personalities/individuals than the Slovak organizations. But on larger numbers this problem is not an infrequent one, because also with 0.5% of such "toxic" dark triad persons in Slovakian population, in the population 10.000 e.g. managers we will have 50 such toxic persons (possibly top managers or politicians which if are also very intelligent can be very dangerous), in Croatia even more. So, this can be quite a serious organizational problem which can potentially destroy organizational and economic development.

3.4. Results about the forth problem: Difference in the variables of Machiavellianism, narcissism and psychopathy between male and female management students in the Croatian and Slovak Sample

To explore if there is a statistically significant difference between research variables between female and male subjects in the Croatian and Slovak sample, we performed an ANOVA test. This ANOVA tests were conducted in two parts - Croatian Sample and Slovak Sample. The results of Croatian sample (gender x components of Dark Triad variables) results are presented in table 7.

Table 7. Differences in the variables Machiavellianism, narcissism and psychopathy between male and female students in Croatian sample (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
MACHIAVELLIANISM	Between Groups	2.499	1	2.499	9.170	.003
	Within Groups	40.332	148	.273		
	Total	42.830	149			
NARCISSISM	Between Groups	.142	1	.142	.685	.409
	Within Groups	30.718	148	.208		
	Total	30.860	149			
PSYCHOPATHY	Between Groups	3.457	1	3.457	10.473	.001
	Within Groups	48.858	148	.330		
	Total	52.315	149			

Source: Research results

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The results suggest that there is a statistically significant difference between male and female Croat subjects (F=9.171; p=0.003) in the Machiavellianism variable, and in the psychopathy variable (F=10.743; p=0.001). No statistically significant difference was found in the variable of narcissism ($F=0.685; p>0,05$).

Male Croat students scored statistically significantly higher in Machiavellianism ($M_{\text{Machiavellianism}}$=3.84; s=0.47) as compared to female students ($M_{\text{Machiavellianism}}$=3.54; s=0.54). Male Croat students also scored statistically significantly higher in psychopathy ($M_{\text{psychopathy}}$=3.03; s=0.61) when compared to females ($M_{\text{psychopathy}}$=2.66; s=0.56). Such results are consistent with past literature (Furnham et al., 2013), which suggest that male is prone to Machiavellianism and psychopathological behavior.

The results of Slovak sample (gender x components of Dark Triad variables) are presented in table 8.

Table 8. Differences in the variables Machiavellianism, narcissism and psychopathy between male and female students in Slovak sample (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
Machiavellianism	Between Groups	3.231	1	3.231	15.947	.000
	Within Groups	37.073	183	.203		
	Total	40.304	184			
Narcissism	Between Groups	.167	1	.167	.693	.406
	Within Groups	44.141	183	.241		
	Total	44.309	184			
Psychopathy	Between Groups	3.596	1	3.596	15.869	.000
	Within Groups	41.469	183	.227		
	Total	45.065	184			

Source: Research results

From the table 8. we can see the same situation by Slovak sample as by the Croatian sample. Namely, the results suggest that there is a statistically significant difference between male and female Slovak subjects (F=15.947; p=0.000) in the Machiavellianism variable, and in the psychopathy variable (F=15.869; p=0.000). No statistically significant difference was found in the variable of narcissism when compared male and female Slovaks ($F=0.693; p>0.05$). The conclusion about this results is the same as by Croatian sample.

In the comparison of dark triad variables and criterion of working during the study no one significant difference was found in Croatian sample. In Slovak sample, only by psychopathy (F= 15.87; p<0.01) in the direction of somewhat higher value on psychopathy by the examinees which not work during the study (M=2.18) in comparison with examinees who work during their study (M=1.95). But this arithmetical means are so low that cannot be conclusive, and this cannot be significant/important because in the variable of psychopathy in Slovak sample are only two higher values so cannot be generalized on the sample.

4. Measures for reducing the dark triad organizational threat

While the Croatian sample had statistically significant higher dark triad values than the Canadian sample, it is clear that no one organization is immune to dark triad and its component effects. In HRM are visible the obstacles

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with the employees which has dark side characteristics. So, it is important to find ways to reduce and avoid the dark side´s effects in organizations. The basic approach could involve:

(I) Preventive measures:
a) *Improvement the HRM practice*: in the employment process (recruitment and selection), professional selection the employees for some specific jobs, advancement and transfer. When some candidates lack concern over ethics, it indicates a manipulative personality (Machiavellianism). When some candidates are over-confident, over-self-promoting or entitled, this is an indication of a narcissistic personality, and if some of candidates overuse the impression management tactics it can be an indication of a psychopathic personality. So, it is to expect that dark triad individuals will try during the selection process to make the impression of the most acceptable candidates, but his real "face" they will show much later. Also, it is to know that intelligent persons with dark triad can also manipulate with test material, and in every phase of selection process (it shows that extremely inteligent and manipulative are extremely dangerous). For that purpose Babiak & Hare (according Langbert, 2010) propose structural behavioral interviews before introducing the employees in the organization. Although there is no universal suggestion it is important to in HR diagnosis to identify which candidates are those and which characteristic are high (Spain, Harms & Lebreton, 2013). Namely, bad can be managerial decision to engage the team with peoples prone to subclinical psychopathy. Therefore, is especially important to educate the HRM staff to recognize some of discrete malign phenomena and behaviors in order to prevent the possible negative impacts of dark triad personalities.
b) *Improvement the workplace conditions*: The organizational conditions that may "bring out" the dark triad in current employees include e.g. "pitting" of teams or departments against each other, unequal treatment, lack of structure, misunderstood corporate values, deliberate management manipulation. In improved psychosocial workplace conditions there is less chance to have dark-triad persons in charge and organizational suffering from their operations.
c) *Ethics education and promotion of spirituality management.* Introducing servant leadership with human values of truth, doing right, love, peace and nonviolence promotes an ethical organizational climate/culture. With such a socialization, dark triad behaviors can be in some extent prevented.

(II) Reactive measures:
a) *Raising management awareness and dealing with Dark Triad individuals*. Stimulating the thinking of managers around the potential of the "dark triad" personalities of engaged human resources in organization to improve organizational shortcomings or even crisis (e.g. disturbed human relationships, job dissatisfaction, poor job engagement/motivation, poor job performances). This is important to make responsive actions to effectively manage them (when the preventive measures missed to recognize the dark triad persons). For example, in the case of complaint on behavior of some employees it can be used the check list which can use educated HRM staff (professional) who is skilled in recognizing specific behaviors. Because Dark triad persons communicate and behave on very different way with different persons (on one way with superiors and totally different way with subordinates sometimes it is difficult to sign such employees (Boddy, 2005). The reactive measure is also important because the change of dark side characteristics is also possible by means of organizational interventions (Hogan, Curphy & Hogan 1994 according Spain, Harms & Lebreton, 2013). The managerial awareness about dark triad problem is crucial for reaction on it.
b) Raising employee awareness and dealing with Dark Triad individuals. When the threat of dark triad persons in organization is obvious and very real, employees should not confide things (either in oral or written form) or trust without verifying; they should be careful of charming smiles, and be alarmed by unethical behavior or violent behavior from higher management or board of an organization. Here also can help specific informing and trainings which give the knowledge about the ways, characteristics and harmful activities of "toxic" employees (Langbert, 2010). Anonym lines where employees can register unappropriated/nonprofessional behaviors to identify such individuals can be helpful. In the frame of HRM working condition and health protection it is also

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important to assure the support to the employees who are the victims of dark triad individuals or even groups (cf. Bogdanović, Durian & Cingula, 2016).

In general, to affront with organizational dark triad characteristic it is of crucial importance the organizational communication. Open, unambiguous and effective communication lower the psychological space for manipulation behaviors. If the organizational politics to the employees is clear, consistent, directed to the tasks and goals execution, to the quality of human relationships, if the organization is in effort to raise the awareness of management and employees and dealing with the problems in general, so is enhanced the possibility of limiting the employees with dark side characteristics in their activity (Baboselac-Marić, 2015). Honesty, culture of correct behavior and truth is very important as preventive and reactive measure in dealing with dark triad individuals.

5. Limitations and proposals for further research

The main limitation of the conducted research is a limited sample with a relatively low number of subjects in two samples (N=150 in Croatia and N=185 in Slovakia), which was also conducted at only one Croatian and one Slovak University. Another limitation can be the language differences between the English and Croatian/Slovak versions of the questionnaires, although the translation was conducted in "the spirit of language" (e.g. item 5 was translated as "It's true that I can be evil to others" because the language can represent different social norms). Also e.g. the term "losers" has a different denotative meaning in "Anglo-Saxon" society and culture than in e.g. Croatian/Slovak culture (in former Yugoslavia/Czechoslovakia under socialism, such a term was practically unknown and thus it still does not have such a negative connotation in Croatia/Slovakia as it has elsewhere; rather, it means something closer to be unlucky). The language differences could make small differences in the results. For these reasons, in high-quality psychometric research, there is a need to standardize questionnaires that are supposed to be valid in a specific cultural surrounding. Another limitation is the comparison with the Canadian sample, which is a totally different culture than the Croatian/Slovak one. Therefore, for Croatian and Slovak norms for subclinical Machiavellianism, narcissism and psychopathy to be obtained, this research should be done on a larger sample. We suggest that further research on the dark management triad should be conducted in other Croatian and Slovak regions, so different results in dark triad traits can be expected. Croatia consist of five different geographic regions which are culturally and mentality somewhat different (Ozimec, 2001) and similar is in Slovakia. Slovakia consists of three different regions; different by geography, by mentality and by conditions for further development. The research of the dark management triad in transition economies and organizations is in a very early phase (organizational treatment by HRM or company management also). There is quite a large space for further research in this management and organization area in other countries.
For example, the research of dark management triad in the countries which resulted from the former Yugoslavia (Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Kosovo and Macedonia) or in other transition economies (Slovakia, Check Republic, Hungary, Romania, Bulgaria, Ukraine, Poland, Latvia, Lituania, Letonia) could be promising.

To understand the deviant workplace behavior of dark triad personalities more completely, there is need to apply a multi-paradigmatic approach, e.g. the Burell & Morgan´s framework (Samnani, 2013). For a deeper understanding of the deviant workplace behavior, the following approaches can be applied:

a) *Functionalist approach* – where the emphasis is on predicting which interpersonal characteristic contributes to the deviant organizational situation, i.e. discovering of regularities and causal relationships that exist between the variables of interest.
b) *Interpretivism approach* – which emphasizes understanding of employees' feeling and meanings about toxic employees and deviant workplace/organizational situations.
c) *Critical management theory approach* – which emphasizes the role of power and alienation in institutions, i.e. the focus of research is on broader issues of power within institutions, which may be stimulus for

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workplace/organization deviations. Deviant workplace/organizational situations can be researched as the result of authority and discipline which normalizes such a situation in the eyes of society and the employees.

d) *Post-modernistic perspective* – emphasizes the presence of multiple "truths", need for emancipation and well-being of employees and the focus of research is on the management practices that produce organizational obedience through the simple exertion of power, control and surveillance. Post-modernistic research is focused less on performance enhancement but more on emancipation and well-being of employees.

Therefore, seeking to understand the deviant workplace/organizational situation in terms of dark side personalities could include multi-paradigmatic approaches of organizational research.

Conclusion

This research has the following main findings:

- Machiavellianism and subclinical psychopathy was higher in Croatian than Slovak sample (statistically significant and $p<0.01$ level). In the narcissism variable, there were not significant difference ($p>0.05$).
- More Machiavellian, subclinical psychopathic and "dark triad" personalities is found in Croatian sample than in Slovak sample. In Croatian sample, it is found 4% of dark triad personalities and 0.5% in Slovak sample. But also in Slovak sample although in some lower level than in Croatian sample is identified the dark triad presence.
- In the both of Croatian and Slovak sample, we found statistically significant differences between male and female subjects in Machiavellianism and psychopathy ($p<0.01$), in the direction of higher values of male students, but not in the scale of narcissism ($p>0.05$).
- The cause of statistically significant higher results of dark triad variables in the Croatian sample in comparison with the Slovak sample can be explained by cultural and social determinants of the examined populations.

For dealing with the challenge of Dark Triad personalities proposed are the practical implications for organization and management in two senses:

I) Preventive measures:

a) *Improvement the HRM practice*: in the employment process (recruitment and selection), selection the employees for some specific jobs, advancement and transfer. When some candidates lack concern over ethics, it indicates a manipulative personality (Machiavellianism). When some candidates are over-confident, over-self-promoting or entitled, this is an indication of a narcissistic personality, and if some of candidates overuse the impression management tactics it can be an indication of a psychopathic personality. In HR diagnosis is especially important to educate the HRM staff to recognize some of discrete malign phenomena and behaviors to prevent the possible negative impacts. Implementation of multiple feedback on manager's competences into HRM processes of HR diagnosis. Feedback based on working behavior observation identify Dark Triad symptoms and leads to working with the feedback.

b) *Improvement the workplace conditions*: The organizational conditions that may "bring out" the dark triad in current employees include e.g. "pitting" of teams or departments against each other, unequal treatment, lack of structure, understood corporate values, deliberate management manipulation. Clear organizational communication and management example which communicate inappropriateness of dark triad behaviors here is crucial.

c) *Ethics education and promotion of spirituality management*. Introducing servant leadership with human values of truth, doing right, love, peace and nonviolence promotes an ethical organizational climate/culture. The dark triad behaviors can be to a certain extent prevented with such a organizational socialization.

II) Reactive measures:

a) *Raising management awareness and dealing with Dark Triad individuals*. Stimulating the thinking of managers around the potential of the "dark triad" personalities of engaged human resources in organization to avoid

organizational shortcomings or even crisis (e.g. disturbed human relationships, job dissatisfaction, poor job engagement/motivation, poor job performances). This is important to make responsive actions to effectively manage them (when the preventive measures missed to recognize the dark triad persons and avoid their organizational engagement).

b) *Raising employee awareness and dealing with Dark Triad individuals*. When the threat of dark triad persons (e.g. some individual, manager or even employer) in organization is obvious and very real, employees should not confide things (either in oral or written form) or trust without verifying; they should be careful of charming smiles, and be alarmed by unethical behavior or violent behavior from higher management or board of an organization.

Dark triad persons can be very dangerous (especially if they are managers/business leaders), because in their organizational presence, a favorable ethical climate and culture is not possible. Therefore, organizations have every responsibility to avoid dark triad negative effects. This avoidance can be operationalized by preventive and responsive actions to manage the "toxic employees" threat.

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IMPACT OF LABOUR MIGRATION ON ENTREPRENEURSHIP ECOSYSTEM: CASE OF EURASIAN ECONOMIC UNION

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Abstract. Labour migration is one of the most important socio-economic development indicators. The problem of a steady decline in the working-age population size has changed a role of migration that has an active impact on the human potential development. With the help of an empirical example from the Eurasian Economic Union (EEU), this research paper presents specifics of labour migration. A review of literary sources points out to an ambiguous impact of a number of factors on dynamics of migration flows, employment, and unemployment. Correlation-regression modelling of migration processes for the EEU in various configurations has resulted with the following. First, a revealed direct relationship between a natural growth (decline) in the population, a number of vacant jobs and the population migration indicator. Second, researchers have established an inverse dependence between GDP per capita, consumer price index, minimum wage, unemployment rate, and population migration indicator. Thirdly, they have shown that a direction of migrant flows depends on such factors, as GDP per capita, number of vacant jobs and minimum wage. Results of the analysis show that an increasing difference between an average wage in the region and across the EEU, and minimum standard of living leads to decreasing numbers of migrants from a particular region of the EEU. In the EEU, for the population main reasons for employment abroad include unemployment in rural areas, no regular income, and lower wages compared to neighbouring countries. The discussion explains an essence of contradictory consequences of the labour migration impact on a development of national economic systems in terms of the completed academic and empirical research. In this regard, it is reasonable to consider labour migration as a global economic phenomenon and this needs further research in terms of factors that influence it.

Keywords: labour migration; Eurasian Economic Union (EEU), employment; labour remuneration; migration flows; entrepreneurship ecosystem; migration factors

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1. Introduction

So far, the process of globalization has had an objective and, at the same time, contradictory nature. It relies upon modified functions of international trade, economy development with a network structure and developed outsourcing relationships, an emergence of the global labour market with internationalized workers (Department of Economic and Social Affairs, 2004, p. 138; Singer, 2000; Pekarskiene, Laskiene, Saboniene &Susniene, 2017; Potrafke, 2010, pp. 545-571). In such conditions, migration processes have continued to become more active with a development of global integration that contributes to this.

A wide range of all forms of international economic relations, foreign trade, production and its cooperation in particular, invariably results in a flow of capital accompanied with a movement of the main production factor, i.e. the labour force (Savin & Savina, 2016, pp. 78-83). The population migration is a process that overreacts to socio-economic transformations (Baccaïni, 2007, 139-155; Commission on Population and Development, 2013), and largely projects such trends, as regional differentiation and inequality (Rayp, 2013).

With considerations of the Eurasian Economic Union as a promising macro region (the EEU includes Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia) it is possible to conclude with confidence that employment opportunities between associated countries are still limited. In the formal sector of the EEU, employment often does not meet requirements for labour force reproduction. Under such the circumstances, labour migration remains a priority to ensure an acceptable standard of living for a large part of the employable population. Migration plays an important role in the development of the common labour market in the EEU. In the review of socio-economic conditions and consequences of the migration movement, we should take into account differences living standards and life quality of the population as in the EEU regional differentiation is very high. Therein, active processes of external migration in the EEU show a clear need for a detailed research of this phenomenon.

Each region in the EEU has its territorial and socio-economic specifics, which causes different levels of labour migration of the population, both national and intercountry. The valid migration policy in the EEU often focuses on narrow economic considerations of labour migration as a source of a labour force, or, in demographic terms, as a substitute for a natural decline in the population (Usmanova & Azimova, 2017). This objectively leads to a need in a control over external labour migration.

Globalization has also affected a role of the human factor in the social and economic development, which is a direct capital. Labour migration makes a significant part of this capital (Delogu, Docquier, & Machado, 2018, 1-36). This function of migration centers on its quantitative parameters. As its property, international migration of the population has a steady growth in its size. Its structural characteristics are getting of great importance for understanding a role of labour migration in social processes.

In migration processes, changes in time occur under an influence of factors different in nature. In a statistical study of the population labour migration, there is a dynamical analysis among other directions. The dynamics study in a movement of labour migrants will contribute in identification of regularities and intensity specifics when it appears. Migration causes are heterogeneous, their joint impact on the process leads to levelling or a significant increase in migration flows. Sometimes, revealed influence patterns are in contradiction to each other.

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It is customary to identify the following main causes of labour mobility of the population, including imbalance in the country development, income differentiation (Usmanova & Azimova, 2017, 177-182), demographic factors caused by imbalances in a natural movement of the population, cost of labour, high unemployment rate, inflation, economic crisis, etc. (Namatov, 2016, pp. 67-70). At the same time, some researchers (Dosaliev, 2016, pp. 127-130) have found that the level of competitiveness and wage level are inversely proportional. The high value of the latter makes competitiveness lower partly due to labour migration. Among other reasons, there is a location of equity, which acts as a stimulating motive for labour migration (Chernenko, 2015, pp. 50-56).

This leads to the fact that multifacetedness in today's migration processes necessitates a demand and need in new approaches that will allow evaluating an influence, contradictory consequences and revealing a development potential inherent in international labour migration. In this regard, tasks of identification of factors that encourage the population to migrate or limit it, tasks of quantitative measurement of migration flows, acquire certain significance. That is why we will attempt to establish regularities in the influence of a number of factors on labour migration using the correlation-regression analysis of migrants' movement according to the model with various specifications.

2. Literature review

Internationalization is one of today's economic trends of recent times. In this regard, a role of foreign economic activity and, especially, in cases when it is associated with labour migration, significantly increases. From a theoretical point of view, we can see labour migration as a mechanism for redistribution of labour forces in the international labour market. Let us analyse some concepts that will contribute to understanding and explain the motives encouraging labour migration.

There are a number of academic theories that explain directions and causes of international migration processes. The conceptual approach is the most common. It includes the classical economic theory and, in particular, relies upon a ratio of stimulating factors that either 'attract' or 'push out'. According to the theory of historical structuralism by Castles (Lindert, 1992; Sassen, 1988; Portes & Rumbaut, 1990), migration is a way to mobilize cheap labour forces for developed countries and the government and corporations form migration flows. Early concepts explain a process of migration by political, economic factors and inequality of various actors, including countries, regions, enterprises and individuals (Trofimova, 2010, pp. 75-85). These theories recognize importance and necessity of national factors, as well as a role of government regulation in this sector.

According to classical and neoclassical economic theories, excess labour resources move to more urbanized areas with high labour efficiency (Efimov, & Katsan, 2010, pp. 19-27). Of the theories that attempt to explain international migration of the population at the macro level, it is also necessary to refer to the theory of pancapitalism, which explains development of three main types of relocation: 'manual' migration of people, migration because of intellectual and political reasons.

An attempt to find a complex relationship between a migration country and host country relied upon the concept of dual/fragmentized character of the labour market (Doeringer & Piore, 1971, pp. 13-28). Its core is an assumption that growing interdependence of countries plays a decisive role with subsequent equalization of supply and demand for the labour force within the framework of macro-associations. Because of market harmonization, new factors arise that give rise to certain growth points for the economic development of countries.

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Within the framework of academic approaches, there are different levels of analysis regarding an origin and development of labour migration. Quite often concepts do not comply with each other. Besides, these academic approaches cannot sometimes explain individual manifestations of migration.

A number of today's approaches to reasoning of international labour migration processes create new opportunities for understanding mechanisms that govern migration processes. In particular, there are Massey (Massey, 2007, pp. 146-172) with his synthetic theory, Glick with his theory of transnational migration (Glick, Bash, & Blanc-Szanton, 1992), Kritz with his theory of migration systems (Kritz, Lim, & Zlotnik, 1992), and Rozenau's theory of interdependence (Rosenau, 1993, p. 499).

Taking into account growing scales of labour migrations in the modern world, there is an urgent need to combine the mentioned concepts within a single fundamental paradigm that would provide an opportunity to have comprehensive answers regarding causes of creation, operational specifics, and socioeconomic consequences of labour migration, in the context of the EEU integration into the world's labour market in particular.

Note that the world's labour market depends on institutional flexibility in national markets, which determines mobility of the workforce. Institutional flexibility of the labour market is subject, first, by norms of legislation, but other institutional factors play a particular role, which include: an approach to formation of wages and compensation package, indexation procedure, insurance system, role of trade union organizations, interaction with the market of educational services, etc. (Department of Economic and Social Affairs, 138). All this factors influence a rate in inter-sector redistribution of labour forces, a pace of a change in the employment structure, and a use of non-standard forms of work, mobility, working hours, wage changes depending on business activism and economic cycles (Tsvylev, Rydvanov, & Zhiritsky, 1994, p. 30) (Tsvylev, Rydvanov, & Zhiritsky, 1994, p. 30). These and other features constitute a factor model of labour migration.

Sources give a diverse typology of interrelated factors that influence directions and scales of labour migration processes. An analysis of migration causes and factors relies upon the classification by Massey and Skurl (Massey et al., 1998). As we have mentioned above, the factors that influence a movement of the employable population act simultaneously, and are to some extent interdependent, and sometimes opposed to each other. Therefore, it is very difficult to find sources of separate migratory processes.

Labour migration has both positive and negative sides. Thus, it has been confirmed that an overall benefit from liberalization of a migration regime would be about several times higher than an effect from trade liberalization (Rodrik, 2002; Overcoming Barriers: Human Mobility and Development, 2009). Migration has virtually no negative impact on unemployment and wage level in host countries (Haisken-DeNew & Zimmerman, 1995; Brücker, 2002; König & Koskela, 2011, pp. 21-38). According to empirical data from the USA and several EEU countries, a conclusion is possible that an impact of migration on employment and unemployment is not so significant (Glushchenko, 2008, pp. 65-79). The connections that arise from labour migration, most often even increase employment levels. For instance, Brucker (2002) found the following: wages of blue-collar workers will only drop by 1.05%, while that of white-collar workers will increase by 0.18% if a share of migrants in the labour force grows by 1% (if the labour market is in equilibrium). If the labour market is not in equilibrium, wages of blue-collar workers will fallen by 0.58% (unemployment will get 0.85% higher), while wages of highly skilled workers will get 0.19% lower (unemployment will increase by 0.05%) (Samrailova & Veshkurova, 2010, p. 1321).

According to other sources, labour migration makes an average level of labour remuneration in a region (sector) lower and, accordingly, cuts down tax revenues to the budget (Khrustalev & Slavyanov, 2014, pp. 79-86). We can explain this with the fact that foreign workers get incomes and do not accumulate them as savings. Instead, they

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transfer them abroad in foreign currency (Gotovtseva, Ryazantsev, & Khrustalev, 2012). Micco and Pages share the same position. They refer to a significant impact on social division and a size of labour remuneration, as well as a level of social tension in regions with a long and intensive inflow and, on the contrary, outflow of the locals (Micco & Pages, 2006, p. 6). There is also a simultaneous impact on overall and structural insufficiency of region's labour resources; international labour migration mitigates such aspects. Employment of immigrants results in higher elasticity in the labour market. At the same time, researchers have found that there is a steady correlation between levels of education, professional qualifications and population mobility (Suliagina, 2016, pp. 185-189).

Historical experience confirms a close relationship between migration and development in the employment sector. However, at the present stage, a nature of this relationship is much more diverse. Migration processes also entail changes in social and demographic structures of the society. It is noteworthy that migrant workers contribute to establishment and support of communication between countries (Nazarov, 2012, pp. 82-86). Thus, migration is a significant stimulus for the world economy development, redistributing the population between countries.

In this connection, the problem of international labour migration and its impact on national labour markets in terms of globalization seems to be currently central, as well as a need in labour mobility research. The study of labour migration in time will allow assessing an impact of factors on employment and identifying main development trends.

3. Materials and Methods

We believe that we should make an empirical analysis of migration in the EEU with a focus on the most significant factors of migration. The observation period includes 2006-2017 with an interval of 1 quarter except for a number of indicators, for which statistical data are limited (Annex). The main sources of data were the information resources of Rosstat, IMF, central banks in the EEU countries, and the EEU Statistics Department.

Note that since 2014, in many sectors of economy, there has been an observed decline, while labour migration has had a steady growth. It is what has helped to mitigate serious consequences of an economic slowdown, making a fractal compensation for lost income from exported raw materials and goods at the expense of remittances made by migrants. Statistics of the Russia's Central Bank (Russia's Central Bank) and international payment systems evidence it as a result for 2016-2017, according to which a volume of remittances from Russia to Uzbekistan and Tajikistan decreased, and to Kyrgyzstan and Kazakhstan, on the contrary, increased. Mentioned trends highlight serious changes that have recently taken place in labour migration in the EEU. This is because the Russian Federation remains a main centre for migrants' attraction.

Before a regression analysis, experts had built a correlation matrix to identify a relationship between endogenous and exogenous variables, investigated co-linearity and covariance of factors. Having reviewed sources for a primary analysis, experts selected several factors (variables) that influence migration, including GDP per capita, remittances between countries in the Union, exported goods and services, employment rate of the employable population, unemployment, purchasing power of a national currency, consumer price index, cost of borrowings, increase in the population, average and minimum wages in a country, a number of economically active people. Not all the variables have confirmed their validity, a number of factors have been excluded. This highlights that some approaches discussed in the literature review are incompatible and inconsistent. We tested whether it was possible to use the parameter of the demand in the workforce based on resource balance, where excessive or deficient numbers of workers in a national market reasonably lead to formation of migration conditions.

The econometric model relies on hypotheses of dependencies in a migration flow.

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First, empirical data indicate that there is a direct dependence between a natural growth (decline) in the population, specific weight of borrowing cost, number of vacant jobs and population migration index in the EEU;

Second, such indicators as GDP per capita, consumer price index, minimum wage and unemployment rate in a country of the Union are inversely related to migrations of the population in the EEU.

A number of migrants from the country (Emigr) is a dependent variable in the model. We estimated statistical significance of coefficients using Student's t statistics and compared with the t-test. Individual indicators were statistically insignificant (therefore excluded from a sample). Note that we logarithmized variable numbers of migrants from the country and GDP per capita in order to improve normal distribution of residuals and minimize standard errors of the model with the data measured in various units.

In its generalized form, the initial model looks like the following (1):

$$Emirg_i = \alpha + \beta_1 GDP\_p_t + \beta_2 Unemp_1 + \beta_3 \Pr ice_t + \\ + \beta_4 Cred\_eac_t + \beta_5 Cred + \beta_6 Wage_t + \beta_6 Jobvac_t + \beta_7 Pop\_net_t + \varepsilon_t \quad (1)$$

where Emigr is a number of migrants from a country; GDP_p is GDP per capita; Unemp is an unemployment rate; Price is a consumer price index; Cred_eac is a cost of loans in national currency; Cred is a cost of loans in foreign currency; Wage is a minimum wage; Jobvac is a need of enterprises in workers; Pop_net is a balance of natural increase (decrease) of the population; α is a free variable that reflects an influence of missed factors not included in the observation; β_1 , ..., β_7 are unknown coefficients of the model; t is a time variable; ε_t is a standard error.

Note separately that due to high values of correlation coefficients between individual independent variables and a disproportionately large number of variables relative to a number of observations per object unit, the presented model was analysed in 3 specifications, i.e. (1)-(3):

$$InEmigr_t = \alpha + \beta_1 \ln GDP\_p_t + \beta_2 Unemp_t + \beta_7 Pop\_net_t + \varepsilon_t \ , \quad (2)$$

$$InEmigr_t = \alpha + \beta_3 \Pr ice_t + \beta_5 Cred + \beta_6 Jobvac_t + \varepsilon_t \ , \quad (3)$$

$$InEmigr_t = \alpha + \beta_3 \Pr ice_t + \beta_6 Wage_t + \varepsilon_t \ . \quad (4)$$

In studies of such a complex and heterogeneous phenomenon as labour migration, it is necessary to apply the statistical approach in order to compare migration indicators. In this sense, a comprehensive analysis of structural changes is an important direction in studies of available disparities in labour migration. It is necessary to identify changes in the socio-demographic structure of the population, in particular, in its employable part in an active development of migration flows. The statistical approach makes it possible to evaluate characteristic directions in a movement of labour resources influenced by various factors. It is important to find out a degree of mobility for the structure, its stability, and strength. A further comparative analysis makes it possible to explore positive and negative trends in structural shifts of labour migration in the EEU.

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3. Results and discussion

3.1. Structural analysis of migration flows in the EEU

We will analyse dynamics of numbers of labour migrants in the EEU by main socio-demographic characteristics in 2006-2017, which we consider in the context of certain characteristics (Table 1). Let us consider the distribution of numbers of labour migrants in the EEU by age and sex groups. The analysis of dynamics showed that there was a decrease in a share of labour migrants among people aged 40-49, almost among all categories of the population. Along with this, an increase in the overall gain for numbers of labour migrants was observed among people in their pre-retirement age (50-59 years) and middle-age groups (aged 25-29, aged 30-34).

Table 1. Social and demographic structure of labour migrants in the EEU

Age groups	Labour migrants,%		Overall gain	Gain rate,%
	2013	2017		
Women:				
Aged 15-24	12.0	12.0	0.0	0.0
Aged 25-29	12.3	8.7	-3,6	-29.2
Aged 30-34	16.6	17.4	0.8	4.8
Aged 35-39	14.2	13.1	-1.1	-7.7
Aged 40-49	30.2	24.2	-6.0	-19.9
Aged 50-59	14.7	20.9	6.2	42.1
Aged 60-70	-	3.7		
Total	100	100		
Men:				
Aged 15-24	16.8	10.3	-6.5	-38.7
Aged 25-29	15.1	19.5	4.4	29.1
Aged 30-34	15.2	18.8	3.6	23.7
Aged 35-39	14.9	13.6	-1.3	-8.7
Aged 40-49	28.9	25.9	-3.0	-10.4
Aged 50-59	9.1	11.6	2.5	27.5
Aged 60-70	-	0.3		
Total	100	100		
Urban population				
Aged 15-24	13.9	9.2	-4,7	-33.8
Aged 25-29	13.0	15.5	2.5	19.2
Aged 30-34	16.2	20.3	4.1	25.3
Aged 35-39	15.3	13.7	-1.6	-10.5
Aged 40-49	29.8	23.3	-6.5	-21.9
Aged 50-59	11.8	15.2	3.4	28.8
Aged 60-70	-	2.8		
Total	100	100		
Rural population				
Aged 15-24	16.8	12.6	-4,2	-23.6
Aged 25-29	15.6	15.9	0.3	1.9
Aged 30-34	15.1	16.6	1.5	9.9
Aged 35-39	13.9	13.1	-0.8	-5.8
Aged 40-49	28.7	27.0	-1.7	-6.0
Aged 50-59	9.9	14.5	4.6	46.5
Aged 60-70	-	0.3		
Total	100	100		

Source: Integrated data of the Statistics Department of the Eurasian Economic Commission.

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There are higher overall gains in numbers of migrant workers in such population groups as: women aged 50-59, by 6.2; men aged 25-29, by 4.4, urban population aged 30-34, by 4.1, and rural population aged 50-59, by 4.6. Higher overall gain rate is observed respectively among women aged 50-59, 42.1%, men aged 25-29, 29.1% increase, urban population, 25.3% increase, and rural population, 46,5% increase. Having compared the distribution of labour migrants, we can state that there are some certain shifts: first, there was a smaller share of labour migrants in three age groups: 15-25, by 4.3 p.p., 35-39, by 1.2 p.p., and 40-49, by 4.0 p.p.; second, in other age groups, there was higher proportion of labour migrants, in particularly among middle-aged people (aged 25-26 by 1.6 p.p., aged 30-34 by 2.6 p.p.), and older groups (aged 50-59 by 3.9 p.p., aged 60-70 by 1.4 p.p.).

Findings show that in 2017, compared to 2013, there was an increase in numbers of labour migrants of the male population across almost all age groups. Among women, there is a growth in labour migrations in the groups of those aged 30-34 and 50-59. Among the urban population, there was an increase in labour migrants in middle and elderly age groups. The largest number of labour migrants among the rural population was in the group of people aged 25-29, 30-34, and 50-59. The findings point out to increased numbers of labour migrants among employable men, which in turn lead to a worse situation in national labour markets in 'donor' countries (Armenia, Kazakhstan, and Kyrgyzstan), where there was a decline in numbers of the employed by occupational groups. Enhanced labour flows among the population of young and middle age lead to nation ageing, and this deteriorates the demographic situation in the EEU. Ivanova (2008, pp. 82-97) referred to similar trends in the case of Russia. Table 2 presents the indicators that say of structural shifts related to labour migrants and their main components by age group in the EEU in 2013-2017.

Table 2. Consolidated evaluation of structural shifts among labour migrants in the EEU

Categories of migrant workers	JwA, pp.	JwQ, pp.	RwQ,%	RwA, pp.
By age group, total	2.71	2.99	19.64	0.68
women	3.06	3.83	22.33	0.76
men	3.09	3.62	24.00	0.77
urban population	3.66	3.95	23.82	0.91
rural population	1.91	2.53	18.76	0.48
By education level, total	3.70	4.15	19.47	0.53
women	3.40	4.18	20.01	0.49
men	5.85	6.24	26.84	0.84
urban population	2.50	3.01	15.83	0.36
rural population	4.75	6.18	25.79	0.68
By marital status, total	1.15	1.38	10.99	0.16
women	3.05	3.42	19.62	0.44
men	1.65	2.30	12.54	0.24
urban population	3.00	3.69	28.61	0.43
rural population	3.00	1.73	10.52	0.18
By geographical focus, total	0.26	3.41	33.47	0.95
women	4.22	5.47	43.59	1.51
men	2.50	2.84	32.68	0.89
urban population	3.14	4.12	40.96	1.12
rural population	2.20	2.81	25.28	0.79
By occupational group, total	4.40	6.26	32.85	0.94
women	5.43	2.45	44.16	1.16
men	4.50	6.51	51.43	0.96
urban population	4.07	4.77	26.50	0.87
rural population	6.03	8.31	56.65	1.29

Note: JwA is a linear coefficient of absolute structural shifts, p.p.; JwQ is a quadratic coefficient of absolute structural shifts, p.p.; RwA is a linear coefficient of absolute structural shifts for years, p.p.; RwQ is a quadratic coefficient of relative structural shifts, %.

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The evaluation of structural shifts related to labour migrants indicates that changes, that are more significant, occurred in the urban population. There was a smaller proportion in groups of people aged 15-24 (by 4.7 p.p.), aged 35-39 (by 1.6 p.p.), and 40-49 (by 6.5 p.p.). There were structural shifts related to labour migrations among the rural population recorded in elderly age groups. There was a higher proportion in groups aged 50-59 (by 4.6 p.p.), and 60-70 (by 0.3 p.p.).

The proportion of separate age groups of migrant workers for the period on the average changed by 2.71 percentage points. The quadratic coefficient of absolute structural shifts was 2.99 p.p. The quadratic coefficient magnitude of relative structural shifts was 19.64 %. Thus, the average annual change in all age groups of labour migrants was 0.68 p.p. Experts observed almost the same in the structure of female and male employable population by age groups.

The completed analysis showed almost the same structural changes observed in female and male population groups, related to migrants with basic general secondary or primary level of education. There were minor structural changes observed among men with complete higher education. A higher proportion is among the urban population with complete higher education. The rural population with the basic general secondary education had an opposite situation as in the period under consideration this group's proportion became smaller.

Kapur (2004) identified negative and positive consequences of migrated qualified personnel and such consequences are completely consistent with our findings. On the one hand, countries from which people escape lose their initial investments in education, their human capital gets cheaper, they have a worse situation in certain sectors of economy, and institutional reforms in the society slow down (Kuzmin and Barbakov, 2015, pp. 163-170). On the other hand, highly qualified migrants invest the capital in economy of both their host countries, and countries of origin, a transfer of technological knowledge also takes place. All this contributes to higher investment attractiveness of countries (Kapur, 2004).

3.2. Correlation-regression analysis of labour migration in the EEU

Taking into account conclusions that it is important to take into account the factors that contribute to population migration to the EEU, let us review how a difference in standards of living and minimum wages influence dynamics of migration flows. For this purpose, researchers built the model that looks like the following (5):

$$Emirg_i = \alpha + \beta_1 GDPdif_t + \beta_2 Wdif_t + \varepsilon_t \quad (5)$$

where *Emigr* is a number of migrants, persons; *GDPdif* is a difference between GDP per capita in countries of the EU-20 and EEU, euro; *Wdif* is a difference between the minimum wage in the EU-20 and EEU; α is a free variable that say of an influence of factors not included in the study; β_1, β_2 are unknown coefficients of the model; *t* is a time variable and ε_t is a standard error.

Note that in the model presented, we estimated variables as absolute measurement as the data presented were comparable without a need of logarithmization. There are results of the model's empirical verification in Table 3. For model R^2 is 0.753, $F_{ct.}$ (2.41) = 62.752 (*p*-value = 0.000), the Durbin-Watson (DW) criterion is 1.032.

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Table 3. Model coefficients and their statistical evaluation

Variable	Coefficient	Standard. coefficient	t-stat (p-value)	VIF
GDPdif	-0.824	-0.328	-2.109 (0.041) *	4.032
Wdif	-46.831	-0.568	-3,651 (0.001) **	4.032
Constant	54,673.8		11.50 (0.000) **	

Note: ** is a statistical significance if the level is 0.01; * is a statistical significance if the level is 0.05.

Thus, having modelled an influence of 'attracting' migration factors, we identified that a decreasing difference between minimum wages has the greatest influence on activation of flows of migrants. That is, numbers of migrants increase with a decreasing difference between minimum incomes and this leads to higher wages in the EEU.

Let us consider specifications of the correlation-regression model described earlier, and their statistical evaluations (Table 4). According to the test score in the F-stat, specifications are valid. R^2 determination coefficient for all the models is 0.54-0.68, which is rather high for statistical significance in the correlation-regression analysis of data.

Table 4. Statistical evaluation of model's specifications

Index	Model's specification		
	The first	The second	The third
R^2	0.683	0.539	0.685
$F_{ctat.}$ (p-value = 0.000)	28.74 (3.40)	10.927 (3,28)	44.657 (2.41)
Durbin-Watson criterion (DW)	1.209	1.010	0.999

Despite the fact that specifications of the presented model bring meaningful results, note that the model only contains those migration factors that 'push out' and the model does not provide information on those factors that 'attract.' Estimates based on all the specifications for the regression model confirmed general conclusions of available connections between numbers of migrants and GRP per capita. At the same time, we explain 74% variability of migrant numbers with changed GRP per capita based on the obtained results. According to the calculated coefficient of elasticity, it is possible to conclude that a 10 per cent decrease in GRP per capita results in a 9% growth in numbers of migrants.

A follow-up for this research might include identification of the most significant social factors at a regional level that affect numbers of migrants. Let us build the following model for a linear regression (6):

$$Emigr_{it} = \alpha + \beta_1 Av\_wagedif_{it} + \beta_2 Wage\_debt_{it} + \beta_3 Wage\_\cos_{it} + \nu_{it} \quad (6)$$

where Emigr is a number of migrants, Av_wagedif is a difference between average wage in the region and EEU, Wage_debt is wage arrears in the region, Wage_cos is a difference between wage in the region and minimum living wage.

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Let us analyse findings of pooled regression evaluated with the OLS technique. There are statistical estimates of the model in the following table (Table 5), $R^2 = 0.648368$:

Table 5. Results of model evaluated with OLS technique by formula (7)

Variable	Coefficient β	Standard error	t-stat	P-value	VIF	95% confidence interval	
						min	max
const	1304.5	88.185	14.793	0.00001		1130.83	1478.2
Av_wagedif	-1.016	0.2139	-4.,749	0.00001	1.225	-1.4371	-0.595
Wage_debt	10.722	0.6775	15.826	0.00001	1.172	9.3873	12.056
Wage_cos	-0.8035	0.0739	-10.873	0.00001	1.054	-0.9490	-0.658

Based on calculations for the pooled regression model, we can conclude that the increasing difference between the average wage in the EEU and region and minimum living wage leads to smaller numbers of migrants from a particular region. At the same time, growing wage arrears lead to higher numbers of migrants. Note that an inverse relationship between numbers of migrants and a wage gap is not consistent with theoretical assumptions. Based on the analysis completed, it is possible to conclude that wage arrears are the most influential factor for higher numbers of migrants with regional differentiation taken into account: a 1% increase in this indicator produces almost 5% increase in numbers of migrants.

To identify an impact of private transfers, employment level, bank loans and deposit rates in the EEU, we have completed a regression analysis and built the following models inside. The first model distinguishes an impact of private remittances, remittances as percentage of GDP (x1), exported goods and services as % of GDP (x2) upon the employment rate of the employable population (y) (7):

$$Y=50,318+0,15x_1+0,00118x_2 . \quad (7)$$

Consequently, with a 1% increase in private remittances the employment level among the employable population grows by 0.15%, if other factors remain unchanged. With a 1% increase in exported goods and services, the employment level of the employable increases by 0.001%, if other factors remain unchanged. It is possible to consider the relationship revealed with the help of this model significant as the determination coefficient is within 50%.

The second model distinguishes an impact of private remittances, remittances as percentage of GDP (x1), GDP per capita (x2) and registered unemployment rate (y) (8):

$$Y = 5,380-0,75x_1 -0,000004x^2. \quad (8)$$

Hence, with a 1% increase in private remittances, registered unemployment decreases by 0.75% if factors remain unchanged. It is possible to consider the relationship (revealed with the help of this model) significant as the determination coefficient is 0.61%. Completed calculations showed that private remittances had a positive impact on the unemployment rate and encouraged a growth of national GDP.

Based on the evaluated conformity of model specifications and significance of particular regressands, the following conclusions are possible regarding an impact of socio-economic and demographic factors on population migration rates in the EEU. First, we identified a direct relationship between a natural growth (decline) of the population, numbers of vacant jobs, and population migration indicator. Second, we identified an inverse relationship between GDP per capita, consumer price index, minimum wage, unemployment rate, and population

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migration indicator. Third, the research demonstrated that a direction of migrant flows depends on such factors, as GDP per capita, numbers of vacant jobs, and minimum wages.

Conclusions

Modern global development trends have a significant impact on a development and functioning of labour markets. Based on migration statistics, it is possible to refer to strengthening migration processes in EEU countries. Modelling results made it possible to identify that a decline in the difference between minimum wages has the greatest influence on activation of migratory flows. In the EEA countries, the following reasons are main for leaving for work abroad: unemployment in rural areas, lower wages compared to neighbouring states. Irregular income is a significant argument too for labour migration in the EEU.

A study of an impact of other factors for labour migration made it possible to establish that an increasing difference between average wages in a region and the EEU and a minimum living wage leads to smaller numbers of migrants from a particular region. At the same time, a growth in wage arrears leads to higher numbers of migrants.

The structural analysis says of a higher number of labour migrants among employable men, which in turn results in a worse situation in national labour markets of donor countries. There is a decline in a number of the employed by occupational group. At the same time, host countries are most interested in highly skilled workers (especially in new and promising sectors) that have experience in the field. This in turn will allow achieving substantial savings related to costs of training for professionals. Enhanced labour flows among the population of young and middle ages naturally lead to nation aging making the demographic situation worse.

A search for effective migration policy procedures is undoubtedly becoming an important task for government bodies of the EEU. Based on research findings, it is possible to improve management decisions in such fields, as quota setting for labour migrant flows, introduction of minimum wages, income taxation for migrants, etc. All these measures will help to achieve a control over labour migration and harmonization of processes. At the same time, higher flexibility in the labour market is getting especially important in the context of intercountry competition and EEA countries' joining the global division of labour. In this regard, we consider migration as a global economic phenomenon that needs its further research and evaluation of its impact on socio-economic aspects of development.

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Annex

Table. Data panel from research across the EEU countries for 2006-2017

Indicators	Research timeframe											
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Armenia												
Migration inflow (+), outflow (-), persons	-	-	-	-	-	-37,300	-28,500	-9,400	-24,400	-21,800	-25,900	-24,792
Number of gainfully employed population, thousands of people	-	-	1,184	1,415	1,419	1,463	1,441	1,418	1,388	1,376	1,316	1,226
Average monthly nominal wage, $	149.7	217.0	285.7	264.3	274.7	290.2	350.3	357.7	381.3	359.1	363.1	404.1
Minimum wage, $	41.2	65.8	81.2	78.8	83.2	84.8	80.1	111.0	107.9	113.9	113.9	113.8
Belarus												
Migration inflow (+), outflow (-), persons	1,949	5,626	4,676	8 145	12,249	10,303	9,900	9,328	11,643	15,722	18,494	7,940
Number of gainfully employed population, thousands of people	-	-	4,567	4 654	4,686	4,742	4,723	4,641	4,602	4,573	4,537	5,164
Average monthly nominal wage, $	271.2	323.0	403.9	350.2	406.6	338.9	439.2	564.2	589.9	413.1	361.4	421.7
Minimum wage, $	77.1	87.4	100.1	85.5	132.2	109.8	136.5	162.0	167.4	121.0	121.9	131.8
Kazakhstan												
Migration inflow (+), outflow (-), persons	22,668	33,041	10,962	1,300	7,526	15,516	5,096	-1,426	-328	-12,162	-13,466	-21,145
Number of gainfully employed population, thousands of people			8,228	8,415	8,458	8,611	8,775	8,982	9,041	8,962	9,075	8,999
Average monthly nominal wage, $	323.5	428.2	505.4	456.5	526.7	614.0	679.1	717.4	675.4	568.4	417.6	459.1
Minimum wage, $	71.9	80.7	99.7	92.3	101.4	108.2	115.9	121.1	109.8	66.2	68.5	73.3
Kyrgyzstan												
Migration inflow (+), outflow (-), persons	-	-	-	-	-	-50,628	-39,403	-7,487	-7,203	-7,757	-4,229	-3,965
Number of gainfully employed population, thousands of people	-	-	2,344	2,380	2,420	2,456	2,490	2,497	2,469	2,504	2,544	2,547
Average monthly nominal wage, $	81.4	106.4	147.1	143.6	156.4	201.6	228.2	234.1	229.0	209.2	212.4	223.5
Minimum wage, $	2.6	9.7	8.6	7.7	10.6	14.8	16.0	17.1	15.5	12.8	15.3	17.2
Russia												
Migration inflow (+), outflow (-), persons	107,432	132,319	239,943	242,106	247,449	158,078	319,761	294,930	295,858	270,036	245,384	261,948
Number of gainfully employed population, thousands of people	-	-	75,289	75,700	75,694	75,478	75,779	75,676	75,529	75,428	76,588	76,636
Average monthly nominal wage, $	391.2	531.6	696.9	588.3	690.1	796.2	857.1	936.3	855.8	561.0	548.8	671.0
Minimum wage, $	41.8	93.6	81.8	144.6	140.4	146.6	150.0	158.3	100.2	85.6	120.6	133.1

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INTRA GROUP COMPLIANCE AGREEMENT AS A TOOL TO MANAGE THE RISKS IN THE DAUGHTER COMPANIES *

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Abstract. The contribution deals with the topic of relation ship between the mother company and the daughter company, specifically how to control and verify the compliance rules in the daughters company. The contribution shows the possibility to implement the compliance rules in the daughter company through the so-called intragroup agreement as a frame to set up a correct control, reporting, consequence management in the daughter company as required by the standards of its mother. The research is useful for companies, which operate through various related structures, alliances.

Keywords: compliance, effectiveness, criminal responsibility, post-acquisition, SPV, sanctions, vulnerability, mother-company, daughter-company, intra group relations

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JEL Classifications: M14, M16

Additional disciplines: law, risk management, compliance

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1. Introduction

In 2014 there were 26.307.386 active business corporations in the EU.[1] Approx. 2.500.000 new corporations have been settled within the EU annually.[2] EUROPOL and EMCDDA estimate the annual size of the EU drug market on 24 -31 billion EURO. [3]Acc. the EC, the MTIC/VAT tax fraud annual gap is estimated to 5 billion EURO.[4]
The good governance and due care are the tools to avoid the misuse of a corporation for criminal or illegal conducts as mentioned upper through responsible and ethical approach in everyday business. The primary objective of the good governance represents a tool for the constant assess of the compliance maturity of the legal person in order to avoid or to mitigate the risk of criminal liability of the corporation for the past, current and future criminal offences and ensure the constant sustainability of the entrepreneurship in changing environment. Usually dependent on the frame, approach set by the regulatory bodies.

Entering the markets or shall be done directly or indirectly through establishing the SPV or daughter company or buy a control share in the existing one. The newly established daughter company operates suffers from all the problems just like the terms of poor legislation, complicated official procedures to obtain licenses and approvals, and the bureaucratic administration.[5]

Very often the relationship between the public sector and the private sector is still blurred and unclear. There has been no change in the nature of operations between the public and private sectors to enable them to better serve the local community, and accordingly create stability in the investments due to political, geographic, and climatic factors the government is not responsible for. Notwithstanding the existence of a legal framework for the operations of the private sector about business-related procedures, whether related to establishing businesses and other procedures, prolonged litigations and claims.[6]

All these factors raise the risk of corruption, unfair competition, misuse of funds, and breach of trust etc in the newly acquired daughter company. To ensure the same level of compliance and due care driven within its own corporation needs to be applied in a same level also it is daughter corporations, SPV etc. The ration is to mitigate or avoid the responsibility of Mother Company for the illegal conduct subscribed to its daughter. This is done through comprehensive due –diligence in the pre-acquisition phase but as well during post-acquisition phase through implementing mother own standards of due care and compliance.

Business has their own responsibility to act with integrity. Following the notion of corporate social responsibility, companies not only need to comply with laws and regulations; it is increasingly expected that they should also adhere to globally-recognized ethical standards and expectations from society (which might even go beyond the law) as part of their business activities. Assessing whether companies implement anti-corruption ethics and compliance programs within their own operations, promote integrity in their supply chains, publically report on their anti-corruption endeavours, or engage in collective action initiatives with their peers or other stakeholders is therefore also relevant to understanding where a country stands on business integrity. We can summarize the main risks of business criminal practices as following
- criminal offences and financial penalties for the company, imprisonment for directors and managers;[7]
- financial loss to the organization which is caused by paying out in bribes; [8]
- loss of licenses, business reputation and blacklisting, etc.[9]

Adoption of the compliance strategy within an enterprise has a potential to bring benefits to a company. On the one hand, preparation of such a policy would need an extra staff to deal with ethical issues and further costs for program implementation. However, if such a policy would actually function, the costs for its preparation could be regarded as the investment into future savings which would be otherwise paid on damages or leaked out due to irresponsibility of employees and, furthermore, initial costs would be also brought back when a

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company will get more financial opportunities thanks to its reputation improvement due to the fact that it operates with high ethical standards. Even results of a 1999 DePaul University study of 300 large companies indicated that those companies "which made an explicit commitment to follow ethical standards provided more than twice the values to shareholders that com panies that did not".[10]
To sum up, we can talk about the following potentials (Transparency International, 2008)
-enhancement of a company reputation as a business that trades ethically increases its access to national and international markets;[11]
- better prospects to acquire government business;[12]
- better protection of business against legal penalties, blacklisting or loss of licences;[13]
- encouragement of good working relationships and morale;[14]
- not some bribe payer or receiver but the owners will be in real control of their business;[15]
- better management and saving of money which would be otherwise used for bribery or not earned because of inconvenient business.[16]

2. The need of compliance coming from the European legal framework

Common market and free movement of men, goods and assets led the new markets to be entered and the new business models to be established. The business relations started to be more structured and complicated. The corporations face tremendous and dynamic press on the compliance of their every-day business with the required standards. Requirements of *the due care* are set not only by the ISO norms but also by the ability of a mother company establish high level of ethical conduct in its daughters and SPV and, once established, control it.

Recently introduced concept of the criminal responsibility of legal persons starts to be the second part (even more important in many cases). Due to the fact that criminal liability of legal entities[17] has been introduced in all EU states apart from the Bulgaria, Germany, Greece, Latvia and Sweden[18], the risk of criminal liability for the corporation materialized if a crime is committed and there is a causal link between the legal entity and a natural person in the exercise of the power to represent that legal person or to exercise the power to take decisions on behalf of that legal person or to exercise the power to exercise control within that legal person or to neglect the supervision or due diligence of that legal person. This concept does not exclude the liability of the mother company to fail to establish effective compliance environment in the daughter company (established or acquired).[19]

In general a legal person is considered to have committed a criminal offence if the criminal offence was committed for its benefit, on its behalf, as part of or through its activities by
(a) its statutory body or a member of its statutory body,
(b) a person performing control or supervision within the legal person, or
(c) another person authorized to represent the legal person or make decisions on its behalf.
(A legal person is considered to have committed a criminal offence also if a person referred to under the letter a) to c) fails, even if by negligence, to properly perform its control and supervision duties, thus allowing a criminal offence being committed by a person acting within the scope of authority conferred by the legal person.

It varies wheatear a legal person shall not be held criminally liable for a criminal offence committed by a person referred above (the employer) if the failure to properly fulfil control and supervision duties by the legal person's body or persons referred to in (a) to (c) is of negligible significance with regard to the object of activity of the legal person and to the manner, consequences and circumstances of the commission of the offence. Criminal liability of a legal person is not usually conditional on whether the natural person referred to a) to c) has been found criminally liable or on whether it has been established which natural person acted in a manner referred.

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As a good example of this practice may be illustrated on the *DIRECTIVE 2008/99/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on the protection of the environment through criminal law* that establishes the obligation of all member States the following conduct constitutes a criminal offence, when unlawful and committed intentionally or with at least serious negligence:[20]

- the discharge, emission or introduction of a quantity of materials or ionizing radiation into air, soil or water, which causes or is likely to cause death or serious injury to any person or substantial damage to the quality of air, the quality of soil or the quality of water, or to animals or plants;
- the collection, transport, recovery or disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including action taken as a dealer or a broker (waste management), which causes or is likely to cause death or serious injury to any person or substantial damage to the quality of air, the quality of soil or the quality of water, or to animals or plants;
- the shipment of waste, where this activity falls within the scope of Article 2(35) of Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste and is undertaken in a non-negligible quantity, whether executed in a single shipment or in several shipments which appear to be linked;
- the operation of a plant in which a dangerous activity is carried out or in which dangerous substances or preparations are stored or used and which, outside the plant, causes or is likely to cause death or serious injury to any person or substantial damage to the quality of air, the quality of soil or the quality of water, or to animals or plants;
- the production, processing, handling, use, holding, storage, transport, import, export or disposal of nuclear materials or other hazardous radioactive substances which causes or is likely to cause death or serious injury to any person or substantial damage to the quality of air, the quality of soil or the quality of water, or to animals or plants;
- the killing, destruction, possession or taking of specimens of protected wild fauna or flora species, except for cases where the conduct concerns a negligible quantity of such specimens and has a negligible impact on the conservation status of the species;
- trading in specimens of protected wild fauna or flora species or parts or derivatives thereof, except for cases where the conduct concerns a negligible quantity of such specimens and has a negligible impact on the conservation status of the species;
- any conduct which causes the significant deterioration of a habitat within a protected site;
- the production, importation, exportation, placing on the market or use of ozone-depleting substances.

Member States shall ensure that legal persons can be held liable for the above mentioned offences where such offences have been committed for their benefit by any person who has a leading position within the legal person, acting either individually or as part of an organ of the legal person, based on:

- a power of representation of the legal person;
- an authority to take decisions on behalf of the legal person; or
- an authority to exercise control within the legal person.[21]
-

Member States shall also ensure that legal persons can be held liable where the lack of supervision or control, by a person referred to in paragraph 1, has made possible the commission of an offence referred above for the benefit of the legal person by a person under its authority.[22]

Member States shall take the necessary measures to ensure that legal persons held liable are punishable by effective, proportionate and dissuasive penalties.[23]

The request to establish liability of legal person for the committed offense is presented in numerous legal texts and tools. It is important to establish whether all legal texts and norms require to establish criminal liability of

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legal persons *stricto sensu* or it is sufficient to implement the norm in a way of any (mainly administrative) liability for the committed offense.

The conducted analysis has confirmed that not all Framework Decisions and Directives[24] require the implementation of the direct criminal liability of legal entities as we know them in relation to natural persons. At the same time, however, the analysis confirmed that all European norms that have been analyzed so far require the legal person to be held accountable for the crimes committed. The notion of responsibility in this context is undoubtedly wider and can be interpreted as a criminal offense by a legal person for committing offenses in the form of administrative punishment or indirect criminal liability of legal persons, as critics of direct criminal liability of legal persons put it.

The analyzed international conventions[25] allow to address the liability of the legal person for offenses and the indirect criminal liability of legal persons or administrative punishment. In their text, they are working on the concept of liability and the imposition of a sanction, not specifying that it is only a penalty. The requirement for conventions is to impose effective and effective sanctions. The requirement of the criminal penalties in the conventions is missing. It implies that the above mentioned Conventions do not require the introduction of direct criminal liability of legal entities, since it is wider in scope and the implementation requirement can be met in the form of administrative punishment.

3. Oversea (USDOJ) approach

When a company has voluntarily self-disclosed[26] misconduct in an FCPA matter, fully cooperated[27], and timely[28] and appropriately remediated, all in accordance with the standards set forth below, there will be a presumption that the company will receive a declination absent aggravating circumstances involving the seriousness of the offense or the nature of the offender. Aggravating circumstances that may warrant a criminal resolution include, but are not limited to, involvement by executive management of the company in the misconduct; a significant profit to the company from the misconduct; pervasiveness of the misconduct within the company; and criminal recidivism. [29]

Cooperation comes in many forms. Once the threshold requirements set out at USAM § 9-28.700 have been met, the Department will assess the scope, quantity, quality, and timing of cooperation based on the circumstances of each case when assessing how to evaluate a company's cooperation under the FCPA Corporate Enforcement Policy.[30]

Disclosure on a timely basis of all facts relevant to the wrongdoing at issue, includes all relevant facts gathered during a company's independent investigation; attribution of facts to specific sources where such attribution does not violate the attorney-client privilege, rather than a general narrative of the facts; timely updates on a company's internal investigation, including but not limited to rolling disclosures of information; all facts related to involvement in the criminal activity by the company's officers, employees, or agents; and all facts known or that become known to the company regarding potential criminal conduct by all third-party companies (including their officers, employees, or agents).[31] Timely preservation, collection, and disclosure of relevant documents and information relating to their provenance, including[32]

- disclosure of overseas documents, the locations in which such documents were found, and who found the documents,
- facilitation of third-party production of documents, and
- where requested and appropriate, provision of translations of relevant documents in foreign languages;

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Where a company claims that disclosure of overseas documents is prohibited due to data privacy, blocking statutes, or other reasons related to foreign law, the company bears the burden of establishing the prohibition. Moreover, a company should work diligently to identify all available legal bases to provide such documents.[33]
Proactive cooperation, rather than reactive means the company must timely disclose facts that are relevant to the investigation, even when not specifically asked to do so, and, where the company is or should be aware of opportunities for the Department to obtain relevant evidence not in the company's possession and not otherwise known to the Department, it must identify those opportunities to the Department;[34] Where requested, de-confliction of witness interviews and other investigative steps that a company intends to take as part of its internal investigation with steps that the Department intends to take as part of its investigation; and where requested, making available for interviews by the Department those company officers and employees who possess relevant information; this includes, where appropriate and possible, officers, employees, and agents located overseas as well as former officers and employees (subject to the individuals' Fifth Amendment rights), and, where possible, the facilitation of third-party production of witnesses.[35]

If a criminal resolution is warranted for a company that has voluntarily self-disclosed, fully cooperated, and timely and appropriately remediated, the Fraud Section:
• will accord, or recommend to a sentencing court, a 50% reduction off of the low end of the U.S. Sentencing Guidelines (U.S.S.G.) fine range, except in the case of a criminal recidivist; and
• generally will not require appointment of a monitor if a company has, at the time of resolution, implemented an effective compliance program.

To qualify for the FCPA Corporate Enforcement Policy, the company is required to pay all disgorgement, forfeiture, and/or restitution resulting from the misconduct at issue. To have an effective compliance and ethics program, an organization shall:

- exercise due diligence to prevent and detect criminal conduct; and
- otherwise promote an organizational culture that encourages ethical conduct and a commitment to compliance with the law.
- such compliance and ethics program shall be reasonably designed, implemented, and enforced so that the program is generally effective in preventing and detecting criminal conduct. The failure to prevent or detect the instant offense does not necessarily mean that the program is not generally effective in preventing and detecting criminal conduct.

Due diligence and the promotion of an organizational culture that encourages ethical conduct and a commitment to compliance minimally require the following:

- The organization shall establish standards and procedures to prevent and detect criminal conduct.
- The organization's governing authority shall be knowledgeable about the content and operation of the compliance and ethics program and shall exercise reasonable oversight with respect to the implementation and effectiveness of the compliance and ethics program.[36]
- High-level personnel of the organization shall ensure that the organization has an effective compliance and ethics program Specific individual(s) within high-level personnel shall be assigned overall responsibility for the compliance and ethics program.[37]
- Specific individual(s) within the organization shall be delegated day-to-day operational responsibility for the compliance and ethics program. Individual(s) with operational responsibility shall report periodically to high-level personnel and appropriate, to the governing authority, or an appropriate subgroup of the governing authority, on the effectiveness of the compliance and ethics program. To carry out such operational responsibility, such individual(s) shall be given adequate resources, appropriate authority, and direct access to the governing authority or an appropriate subgroup of the governing authority[38]

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The organization shall use reasonable efforts not to include within the substantial authority personnel of the organization any individual whom the organization knew, or should have known through the exercise of due diligence, has engaged in illegal activities or other conduct inconsistent with an effective compliance and ethics program.

The organization shall take reasonable steps to communicate periodically and in a practical manner its standards and procedures, and other aspects of the compliance and ethics program, to the individuals[39] by conducting effective training programs and otherwise disseminating information appropriate to such individuals' respective roles and responsibilities.[40]

The organization shall take reasonable steps:

- to ensure that the organization's compliance and ethics program is followed, including monitoring and auditing to detect criminal conduct;
- to evaluate periodically the effectiveness of the organization's compliance and ethics program; and
- to have and publicize a system, which may include mechanisms that allow for anonymity or confidentiality, whereby the organization's employees and agents may report or seek guidance regarding potential or actual criminal conduct without fear of retaliation.[41]

The organization's compliance and ethics program shall be promoted and enforced consistently throughout the organization through [42]

- appropriate incentives to perform in accordance with the compliance and ethics program; and
- appropriate disciplinary measures for engaging in criminal conduct and for failing to take reasonable steps to prevent or detect criminal conduct.[43]

After criminal conduct has been detected, the organization shall take reasonable steps to respond appropriately to the criminal conduct and to prevent further similar criminal conduct, including making any necessary modifications to the organization's compliance and ethics program. Tthe organization shall periodically assess the risk of criminal conduct and shall take appropriate steps to design, implement, or modify each requirement to reduce the risk of criminal conduct identified through this process.[44]

Conclusions- Intra-Group Compliance Agreement as a solution

Intra-Group Compliance Agreement (further as an "IGCA") is an internal agreement/contract/ memorandum of understanding. The parties of the IGCA should be (obligatory) Mother company (further referred as "M-COMPANY") mainly a limited liability corporation or the stock corporation founded usually under the same or different law as the daughter company (further referred as a "D-COMPANY") in that it holds decisive share to umbrella the organization in its domestic or international activities.

D-COMPANY is usually a limited liability company or a stock corporation under the country law and part of the Group with its direct and indirect shareholdings. M-COMPANY holds the decisive share of D-COMPANY directly. In relation to its shareholdings, as affiliates, D-COMPANY assumes the role of a so-called parent company.

The basic prerequisite to set up the intragroup compliance relationship, is that M-COMPANY has defined the legality of its corporate action (further referred as "Compliance") as one of its central company objectives and established a separate Compliance Management System (further referred as "CMS") usually under the direction of M-COMPANY's Chief Compliance Officer (further referred as "CCO M-COMPANY").

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It should be agreed in the IGCA that the CCO should be assisted by the Group Compliance Management (further referred as "GCM") department to support his or her duties, – together they will form the Compliance Office M-COMPANY (further referred as "CO M-COMPANY").
The Group Compliance Officer D-COMPANY (further as "GCO COMPANY") should support D-COMPANY's management in meeting its compliance responsibilities. Under his leadership, D-COMPANY establishes to operate a Compliance Management System (further as "CMS") uniformed to M-COMPANY CMS, which needs to be tailored to the national needs, where necessary. D-COMPANY shall operate a Compliance Program **(**further as "CP") in this framework.

The IGCA should state that the Group Compliance Officer in his function (further as the GCO D-COMPANY) is also responsible for the cooperation with D-COMPANY's affiliates in compliance matters. For example, the affiliates´ Compliance Officers have a duty to report directly to the D-COMPANY and also to the Supervisory Board.

The IGCA should also mention that M-COMPANY and D-COMPANY will cooperate closely on compliance matters in line with the International DRC cooperation/governance model acknowledged by D-COMPANY´s Management.

With the goal of implementing the further development of the D-COMPANY Group's compliance organization, which was decided by the D-COMPANY Board of Management, the Parties intend to strengthen and intensify the cooperation.

Notwithstanding that, it should be anticipated that the CO M-COMPANY will support the D-COMPANY in designing and operating its compliance organization by providing central expertise in all matters relating to the provisions of the IGCA.

The cooperation governed by the IGCA should be based on the fact that D-COMPANY's management or the shareholders responsible for its supervision are and shall remain responsible for ensuring compliance.

The cooperation governed by the IGCA should be based on the mutual trust between the M-COMPANY and D-COMPANY. The common high standard of behavior and responsibility of the M-COMPANY and the D-COMPANY precludes, that each submitted request for cooperation meets the legal criteria of the requesting state and M-COMPANY Code of Conduct principles. As well each executed request will meet the legal criteria of the executing state and M-COMPANY Code of conduct principles.

The Parties will furthermore agree that the conclusion of the IGCA shall not alter this responsibility and, in particular, it is not intended to transfer D-COMPANY's responsibility for ensuring compliance to the CCO, CO M-COMPANY or the M-COMPANY Board of Management

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SOCIO-SPATIAL DYNAMICS, NETWORKS AND MODELLING OF REGIONAL MILIEU*

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Abstract. Spatial networking is the 'new normality' of local innovation systems, featuring a heterogeneous set of inter-organizational ties and a constant circulation of information, knowledge, practices, and other intangible assets of actors engaged in the regional innovation milieu. Understanding the particularities of territorial communities formed clarify the socio-spatial dynamics and the development trajectory of the region, its competitiveness and innovative potential. The study explores the variety of factors that affect the patterns of these socio-economic interactions, such as the networking objectives, the stakeholders involved, the benefits projected, their spatial embeddedness, as to reduce the equivocality inherent to methodologies of delimitation and subsequent demarcation of spatial-network interactions. The study rests upon analysis of different types of relations formed between heterogeneous actors of regional socio-economic system, both at inter-firm and inter-organizational level. Providing a classification of major factors that determine the features and patterns of spatial networking, the paper proceeds with discussing the differences in their dynamic configurations using three scholarly concepts – industrial district, business cluster, and global innovation network. The study revealed 20 individual typological characteristics in a group of four determining features of spatial-network interactions – the stakeholders, the linkages, the network, and the context. The typology elaborated is irrelative to the types of spatial networking analyzed, thus, being equally applicable to the modeling of different configurations of entrepreneurial interactions within the regional milieu. Territorial capital assessment requires a holistic approach in determining the socio-spatial dynamics of the regional milieu. This necessitates defragmentation of local ties into value constellations of the single regional socio-economic and innovation system. The study contributes to the understanding of internal mechanisms of various forms of entrepreneurial networking, providing a set of criteria for integrated evaluation of spatial-network interactions.

Keywords: spatial dynamics, regional milieu, local networks, territorial capital

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JEL Classifications: L14, L16, O17, R12

1. Introduction

Regional ecosystem is a mosaic of a unique set of resources and infrastructures (industrial, social, transport, engineering, information, innovation, etc.) characterized by the individual institutional architecture of the territorial socio-economic system that acts as a medium for the formation and functioning of various forms of entrepreneurial networking. Spatially rooted milieu of inter-organizational interrelations and bonds between the subjects of the regional innovation system implies a dynamic 'value constellations' (Normann & Ramirez, 1993) complex of horizontally and vertically integrated actors who represent various institutional helices (business, scientific and educational institutions, governmental bodies and authorities, public associations, other types of non-profit organizations) and are united by their attributive similarities and the commonality of individual aspirations. The combination of complementary competences of stakeholders (including their intangible assets; Teece, 1998; 2007), their quasi-integration (vertical, horizontal, oblique; Leborgne & Lipietz, 1988; 1992) achieved in the course of sustainable formal and informal network links has a fundamental influence on the transformation of the geo-economic context and the trajectory its further development.

Recognizing this interdependence, the contemporary policies on regional socio-economic and innovative development are increasingly associated with the territorial capital assessment (Camagni, 2017; Capello et al., 2011; Perucca, 2014; Toth, 2014). First introduced in the report of the Organization for Economic Cooperation and Development (OECD) in 2001, the territorial capital perspective emphasizes the need of taking into account the specific features of the territories when formulating the regional development policies. In analytical terms this implied disaggregation of the regional milieu into numerous 'inclusions' – spatial networks (e.g. clusters, industrial spaces, technological districts, etc.; see Mikhaylov & Bolychev, 2015) that are rooted in a geographically outlined territorial system (industrial zone, part of the urban agglomeration, city, rural settlement, municipal district, administrative and territorial formation, etc.). These local communities based on common practice (Brown & Duguid, 1991), shared knowledge (Breschi & Lissoni, 2001; Capello, 1999; Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Tallman et al., 2004), or other proximities (Boschma, 2005; Knoben & Oerlemans, 2006; Mattes, 2011; Torre & Gilly, 2000; Torre & Wallet, 2014) form synergies and emergent effects in determining the identity and unique properties of the geospace. The identification of such organizational, institutional, socio-cultural, technological and other intangible coherence of actors plays a key role in the assessment of territorial capital, the competitiveness of the region, its innovative potential. Awareness of the regularities and patterns in the formation of territorial communities enriches the in-depth understanding of regional divergence phenomenon and enables targeted reproduction of the growth node practices within customized regional policies.

2. Literature review

According to the provisions of the actor-network theory (Murdoch, 1998), the interactions of economic entities within the boundaries of the regional ecosystem are characterized by processes of direct and indirect influence on one another and the network environment as a whole, with each of the interacting parties being the cause and effect of the simultaneous reverse influence of the counterpart. Mutual conditionality of actors, generated by their involvement in a network of interactions, contributes to the distribution of roles in-between the network and ensures the filling of its 'structural holes' (Ahuja, 2000l; Hite & Hesterly, 2001; Zaheer & Bell, 2005) – gaps in the network structure. Interactions are an integrating factor for network nodes relative to their competencies,

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providing functional defragmentation of individual elements in a certain type of integrity – the form of spatial-network interactions (industrial district, cluster, technology pole, etc.; Mikhaylov, 2016).

The integration of network interactions into the space of the territorial socio-economic system presupposes going beyond the limits of transactional relations, strengthening the significance of non-commercial ('untraded'; Storper, 1995) interdependencies and interpersonal relationships ('weak ties'; Granovetter, 1973). Involvement of representatives of various institutional helices in the processes of spatial-network interactions determines the breadth and variability of the combinations of relations that are formed between the network stakeholders. Their diversity are being formulated in the models of triple (Etzkowitz & Leydesdorff, 2000), quadruple (Carayannis & Campbell, 2009), quintuple (Carayannis & Campbell, 2010; Carayannis & Rakhmatullin, 2014) helices. The types of interactions being formed are characterized by:

- involvement in the processes of design, development and production (for example, collaboration, provision, complicity);
- information exchange, communication of knowledge (e.g., learning, examining, exploring);
- coherence and coordination of actions regarding intranet processes and the external environment (e.g., strategic partnership, fellowship, association);
- focus on mutual support, which does not involve direct commercial benefits (e.g., assistance, support, facilitation, reciprocity);
- rivalry within the boundaries of individual stages of the innovation process and the struggle for resources (e.g., competition, co-opetition);
- correlation of operational activities and strategic planning with respect to both individual and network-wide development trajectory (e.g., conjugation, coordination).

The presence of institutional, social, cultural, organizational, technological, cognitive intersection points (i.e. common grounds) at the inter-organizational level is correlated with the similarities (or 'closeness'; Gertler, 1995) of certain properties and functions of elements of the network of interactions. From the privision of classical economic theory the similarities considered are expressed in the dyadic inter-firm production relations of the model of inter-industry input–output tables (Leontief, 1973) – i.e. the value chain. With the broadening of the understanding of the nonlinearity and openness of the innovation process of the knowledge economy (Mikhaylova & Mikhaylov, 2016), inter-organizational interactions are increasingly being interpreted through non-hierarchical connections of heterogeneous entities. The interactions of dissimilar actors that possess a different knowledge base, set of competencies, employment but complementary in the context of individual elements of the innovation process are found to be the most significant source of radical innovations, forming the inalienable competitive advantages of the network and the territorial capital of the region, thus, being the focal point of competitiveness of the regional innovation system.

A society acts as a catalyst for spatial-network interactions between both business entities (B2B) and between legal entities and the end user (B2C). The unmet market needs generate demand for a set of value propositions embodied in goods and services that satisfy the current and future needs of a certain category of people. Development and, most importantly, commercialization and distribution of innovative products and solutions is the key task of business, which is the central element of spatial-network interactions – the core of the concentric waves of the network that initiates and bonds the totality of stakeholders. In the process of spatial networking, there is a continuous transfer of products – goods, material resources, products and other tangible objects; services, including non-profit and public services; and information, both in its explicit (e.g. documents, procedures, standards) and implicit (e.g. ideas, skills, competencies, experience, best practices, organizational culture) forms.

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The nature and structure of spatial networking is uneven due to differences between interacting actors and the objectives pursued. Inter-firm interactions tend to build linear hierarchical links in the form of a value chain, in which duplication of company's functions represented in a particular market segment is excluded. Thus, the intra-network competition is minimized. Unification of direct competitors generally takes place for a certain period of time (including the phenomenon of 'temporal clustering'; Torre, 2008) around large-scale resource- and knowledge-intensive projects or in response to external threats (e.g. in the pursuit to combat external competitors in the domestic market, respond to crisis phenomena or drastic changes in business conditions, etc.). Creation of strategic partnerships, coalitions, alliances and other associations except for the above is realized in cases of penetrating foreign markets in order to reduce risks and costs (e.g. via economies of scale); lobbying the interests of the industry in communication with government authorities; creation of common norms, rules, business culture as to facilitate further work within the network and with third-party organizations (e.g., implementation of international financial and quality standards, personnel policy criteria, etc.), and a number of other reasons.

Interaction of business entities with academia relates, above all, with the objectives to meet the needs for qualified personnel of the appropriate training profile. In this regard, companies conduct a dialogue on the content of the curriculum; provide scholarships for targeted training; participate in student training through the establishment of internship platforms, resource centers and the provision of on-site training for students. Other activities include realization of the scientific and technological (S&T) potential of universities and academic institutions. Companies finance research of fundamental and applied nature, production of prototypes, laboratory testing, and the creation of their own laboratories based on HEIs grounds with the involvement of researchers to implement long-term projects. With the introduction of centers for collective use in the science and technology parks of universities, companies are involved in the joint use of the technical and laboratory facilities. Companies provide commercialization and transfer of technologies through the use of intellectual property; purchase of license agreements; the redemption of patents; creation of joint projects with the university start-ups and small innovative enterprises, supporting the implementation of entrepreneurial university concept.

The interaction of economic entities with state authorities is aimed at developing consolidated decisions on the necessary measures to support entrepreneurial, investment, innovation, export and internationalization activities, foster modernization of fixed assets and production facilities. State infrastructural projects for the creation of industrial zones, science and technology parks (incl. the highly focused ones, e.g. information technology, bio-technology, etc.), business incubators, technology transfer centers, exhibition and conference centers, etc. are of great importance. Public-private partnership is a common form of solving socially significant tasks. The position of the state as a mediator in the relationship between business and society is expressed in the legal regulation of labor relations; development and implementation of technological, environmental and other standards; monitor of the compliance with established rules and norms; support of non-state organizations and the promotion of their economic activity, etc.

3. Research design and methodology

Network interactions that form between actors in the geospace are distinguished by a significant variety of relations, which is caused by a large number of factors and conditions. The uniqueness of the properties of actors and the contextual environment in which they function contribute to the fact that the same types of interactions (competition, cooperation, collaboration, etc.) are realized in different ways. In this regard, regional interactive milieu will be analyzed against a number of spatial-network interaction types. The main factors are classified into four groups (figure 1):

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- the stakeholders: defining the characteristics of the network participants (sectoral and organizational affiliation) and the focus of their interests (goals, priorities, specialization);
- the linkages: determining the nature of relationships between the interacting parties (strength, consistency, objectives, formalization, hierarchy, numbers of connected elements);
- the network: reflecting the participation of the entity in the system of interactions (openness, systemic);
- the context: defining the features of spatial ties (rootedness, linearity, interactivity).

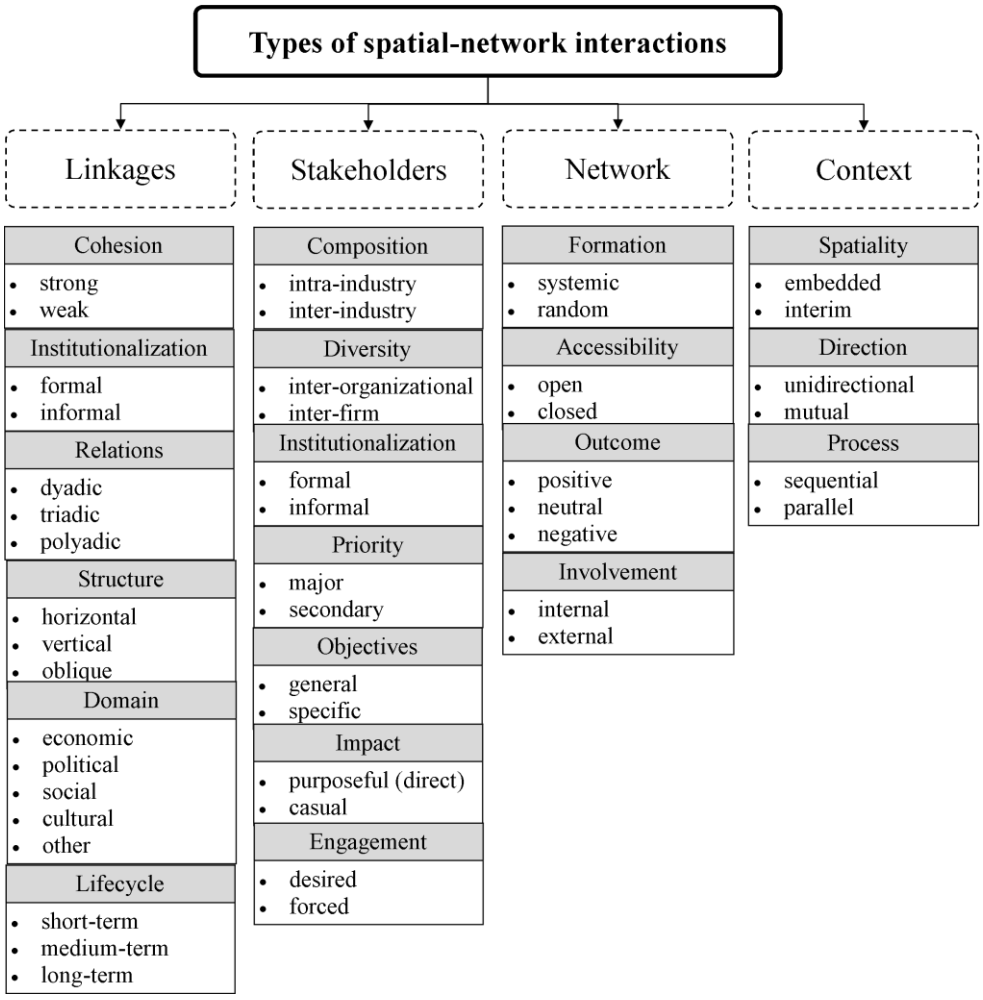


Fig.1. The types of spatial networking

The conceptual basis of the complex structure of spatial-network interactions applied is reflected in the 'uneasy triangle of three C' – competition, collaboration and cooperation (Polenske. 2004). The study is designed inline with D'Aspremont and Jacquemin (1988), who cinsider competition as the primary type of interaction, which subsequently acts as a catalyst for the formation of creative ties – cooperation, and a more comprehensive type – collaboration. The different types of inter-firm and inter-organizational relations between heterogeneous actors of regional socio-economic system identified are to be applied for analyzing socio-spatial interactions of different forms – industrial district, business cluster, and global innovation network. The three different forms of

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networking applied in the study enable to determine particularities in dynamic configurations of interactions in the regional milieu.

3. Findings and Discussions

3.1. Spatial entrepreneurial networking as an integrating factor of regional interactive milieu

Competition is a type of interaction that arises from the similarity of entities (usually in terms of outputs – goods, services, but also in attributive characteristics – employment, location, etc.) in case of the collision of their interests in the short, medium or long term. It facilitates intra-firm resource mobilization, modernization, innovation, and creates dynamism in the development of the economy. The absence or substantial restriction of competition with the formation of oligopolistic and monopolistic systems leads to stagnant phenomena and, subsequently, a decrease in the comparative efficiency of the use of production factors. Competitive relations are the most important mechanism for self-regulation of the economy, stimulating the growth of competitiveness, increasing the efficiency of economic processes (including cost reduction against the background of quality improvement), accelerating scientific, technological and innovative development. High competition is the most progressive type, when business entities are forced to implement strategic innovative projects, develop and implement innovative solutions, produce innovative products in order to remain successful (i.e. profitable) over a long-term period.

Interactions on the basis of cooperation in their essence are the answer to competition and pursue the goal of increasing the competitiveness of participants due to their complementarity. Cooperation can be realized both in the form of dyadic ties and network links, including a wide range of actors from different institutional spheres. Cooperative ties generally presuppose the joint realization of one or several interrelated processes by small and medium-sized business entities. It can be cooperation on secondary tasks, outsourcing, non-exclusive supply, information exchange, voluntary mutual assistance with regard to managerial decisions and training, technological cooperation for the implementation of a joint project, etc. In the short term, the basis of cooperative relations is often the social community, which has no formal consolidation. Long-term cooperation is more mature and involves the formation of stable, often formalized relationships (e.g. association, union). The implementation of cooperation on a systematic basis leads to the embeddedness of ties in the territorial system. According to Fombrun (1982) and Burt (2000), the spatially rooted links are more durable and stable, often bringing small firms together. Vertical and horizontal cooperative relations are distinguished. Vertical cooperation unites economic agents with a different but coherent set of functional roles; horizontal, on the contrary, is the cooperation of similar entities with identical functions. The result of cooperation is generally connected with the extraction of benefits by all interacting participants. A high level of cooperation and communication has a positive effect on innovation activity (Arndt & Sternberg, 2000; Freel, 2003). In a number of cases, the emergence of cooperative relations is forced. A striking example is the links that form in the regional cluster, when competing companies work together to improve competitiveness and solve common problems. Such interactions are called ‘co-opetition’ (Gnyawali & Park, 2009; Gnyawali & Park, 2011; Lechner & Dowling, 2003).

Collaboration is a more complex form of partnership than cooperation, presupposing a sustainable purposeful interaction of two or more actors in the design, production, and promotion of the product or process. Forming collaborations requires a long time and a certain level of trust, representing a complex process of internal restructuring of companies in order to maximize synchronization of actions and ensure consistency that goes beyond the scope of formal agreements. Collaboration results in strong systemic links both sectoral and intersectoral (i.e. inter-industry), being established with a high degree of formalization. An example of collaborative relationships is the outsourcing of elements of a key production or innovation process. Collaboration of economic entities implies their quasi-integration with the establishment of close inter-firm links of three types

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(Leborgne & Lipietz, 1988): vertical, when the buyer has access to the know-how of the supplier; horizontal, expressed in a partnership for the division of labor within a certain technology; oblique, involving the outsourcing of part of the production process while maintaining the overall responsibility before the customer (e.g. in terms of final product quality).

3.2. The configuration of interactions in various forms of spatial networking

One of the most known forms of spatial networking is the classical industrial district, otherwise referred to as the 'Marshallian cluster' (Rugman & Verbeke, 2003), being the historically conditioned agglomeration of small industrial companies clustered in small towns and rural settlements, engaged in utilizing their activities in traditional or craft industries and inter-connected on the basis of product specialization. The company's involvement in the district is expressed through the actual localization of production and the integration of employees into the local community, which has a historically formed identity in the light of a certain economic specialization. The absence of formal barriers for new companies is accompanied by a social confrontation, aimed at driving out the 'newcomer' through unfair competition and 'social blocking'.

Intra-regional cooperation between firms involved in mutually complementary production processes represents a 'system of interacting parts' (Amin, 1989). The consolidation and retention of companies occurs, mainly, at the expense of interpersonal contacts – friendship, kinship, in which the commonality of social culture (Bianchi, 1998) and professional practices (Lave & Wenger, 1991) play a predominant role. Inter-firm interactions of industrial district are largely defined by the high geographical concentration of companies (e.g., street merchants, brewery districts, textile neighborhood) and the population (a significant number of companies represent family businesses). Most of the entrepreneurial interactions are negative (in economic terms) due to the continuous process of copying the best practices of the 'neighbor', including technologies and product range, management and marketing solutions. Cooperation is minimal and takes the form of semi-conscious, semi-voluntary coordination at the horizontal level (e.g. within respect to the local pricing system). The lack of a clear hierarchical structure makes it difficult for the collaboration to occur (e.g. to introduce technological innovations).

Business cluster interactions of regional actors implies not only the presence of large companies, but also the involvement of representatives of the scientific, educational and non-profit sector, which fundamentally changes the structure of interactions. Inter-sectoral inter-organizational interconnections of cluster actors presumes going beyond a narrow branch specialization, being characterized by a combination of formal (i.e. transaction) and informal (i.e. social) relations with the tendency towards the former. Regional clusters do not display same strong connection between society and business as the industrial districts do; the interactions are of an intra-system nature, being formed on the basis of the desire of its participants for mutually beneficial partnership and coherence. Targeted and sustainable internal communications are based on long-term strategic cooperation and collaboration, the advantages of which outweigh the benefits of competition. External interactions are casual. Opportunities of cooperation for external actors with the representatives of the cluster are fully open, but there are certain entry barriers: the accepted technological standards, the delivery system, the quality system, and other indicators of proximity dimensions.

Global innovation networks are also built on the principle of inter-organizational interactions without an explicit link to a particular industry. This form of spatial-network interactions is a conditionally open system. The integration of new participants is difficult, since it requires not only compliance with the network's common goals and objectives (i.e. mutual benefit), but also a certain high level of competence development among actors. Each of the interacting members has a clear leadership in a certain sphere of activity (i.e. global level of quality) and is interesting to others due to its inalienable competitive advantages. The reason for integrating small and medium-sized enterprises into global innovation networks is the availability of advanced technologies, the know-how,

commercialization of which requires large capital investments, incl. in the creation of industrial designs, testing, licensing, etc. Interactions within global innovation networks are of a mutually beneficial nature and are implemented on a sustainable long-term basis.

Conclusion

Regional socio-economic and innovation ecosystem is characterized by a variety of forms of spatial-network interactions that are formed taking into account the specifics of contextual conditions, including the factor of location, and the aggregate of actors that have the potential of gaining mutual benefits using complementarities and intra-network 'related variety' (Frenken et al., 2007). The presented classification of the types of spatial-network interactions arising between actors in geospace reflects the dynamic variety of connections that transform under the influence of a wide range of factors and conditions. Inter-firm interactions tend to build a linear-hierarchical system of interacting elements involved in mutually complementary production processes. The interorganizational coherence of heterogeneous actors representing different institutional spheres (university-business-government-society) can cover the widest range of relationships, including collaboration and quasi-integration of actors. Understanding the relationship between the types and forms of spatial-network interactions makes it possible to reduce the likelihood of discrepancies present in the implementation of existing methodological approaches to delimitation and subsequent demarcation of spatial-network interactions, increasing the efficiency of regional economic, industrial and innovation policies.

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SUSTAINABILITY OF ORGANIZATION PERFORMACE VIA MANAGEMENT TECHNIQUES TITLE OF THE ARTICLE

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Abstract. The article deals with some aspects of relationships with furniture market customers. The research results are presented to identify customer value attributes that are important for customer´s choice, satisfaction and value reporting tools. It has been found out that the most important value attributes are high quality of the furniture design, willingness and kindness of the staff, the professional level of the staff and the variety of designs. The least important value attributes are the loyalty programme, the first purchase discount and the architect´s advice. Personal information resources are more important for the customer than the impersonal ones. The Internet is primarily used as a source of information about furniture in general and it is used to get an overview before buying in a brick and mortar shop. These findings form a basis of a properly designed effective strategy for maintaining current customers and acquiring new ones.

Keywords: sustainability of performance; management; customer relationship management; furniture market

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JEL Classifications: M31

Additional disciplines: sociology; psychology

1. Introduction

The current marketing concept is to bring our customers and consumers a bigger value focused mainly on the importance of building relationships with customers and other business stakeholders to be able to stay competitive and remain on the market via management techniques. Payne, Frow (2005) state, that relationship marketing requires more focus on building the relationships in the value network, than in the transactions themselves, more focus on creating value for the customer and moving from acquiring new customers to maintaining the current ones and strengthening their loyalty. The basis for acquiring and maintaining customers is to create and offer

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value that addresses the customers and fullfills their wishes with a focus on marketing techniques. Creating the value for customers is considered the basis of the marketing concept (Woodruf, 1997) and the basis for all marketing activities. Woodall (2003) considers it a precursor of customer´s satisfaction and loyalty.

2. The current state

2.1 Sustainability of organization performance

There are many customer value definitions, of course. According to Zeithaml (1988), for example, the value for the customer is the relative ratio of what they get and what they have to spend on it. Khalifa (2004) defined customer value as the difference between the customer perception of the benefits received and the sacrifices made. Customer benefits include the material and non-material components of the purchased product/service. The components of the sacrifice include cash and non-cash services. Buttle (2009) provides a simple definition that the value of the customer´s perception of the result is a comparison of the benefits and the sacrifices they had to make. At the same time he offers a simple calculation of value as a share of benefits and sacrifices. He states more specificaly what must the customer sacrifice to get the product, i. e. not only the product price, but also the mental aspects of the purchase. The purchase might be demanding or stressful if the customer percieves higher risk associated with the operational, physical, financial, social and psychological characteristics of the purchased product (Filip, Šimák, Kováč, 2011). The diversity of the concept of value for the customer has been generalized by Lošťáková (2009), who states that the value for the customer is always associated with a particular product or service and is more the customer´s perception than an objectively determined fact by the seller or somebody else. Customer perception is a comparison and evaluation of what the customer gets (quality, benefits) and with what they need to do (such as paying a certain price, making efforts associated with additional costs, so called opportunity cost or maintanance cost). It applies to everything the companies do and for which the customer is willing to pay.

The current trend is creating a value for customers based on a complex solution of their needs. Evanschitzky, Wangenheim and Woisetschlager (2011) defines a complex customer need solution as „an individualized offer for solving customer problems that is interactively designed and when the components bring the customer added value through a combination of products and services in a way, when the value is higher than just a set of components.“ Creating a value for customers is associcated with all stages of the purchasing process, from the identification of the need, through providing the information for selection of the purchased product, the purchase itself, to the purchase evaluation and behavior.(Filipová, 2016), (Vaysilova,2016).

Kothandarman and Wilson (2001) emphasize, that creating value depends on the company´s ability to deliver a higher level of performance in benefits, that are important for the customer, and this ability stems from the company powers in technology and business.

Baines, Fill and Page (2008) state, that the value is relative in relation to the needs, expectations and experiences of the competitive offers within the product cathegory. They add, that the value can also arise from sources different than the product itself and the price, such as branded associations, training programmes for users or legal services. According to Simpson, Sigauw and Baker (2001) it is also the relationship itself between the buyer and the seller, which can create real value, if it is a long-term relationship and if it is difficult for competitors to disrupt it. In addition to excellent products and support services, Lošťáková at al. (2017) emphasizes the importance of building customer relationships by taking care of them permanently and creating more brand value for the customers.

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At present the value is a well known and widely discussed concept for customers. Particular attention is paid to definic the attribute value for the customer. It is not possible to measure the value the customer percieves. What is possible, however, is to reveal certain value attributes for the customer and, based on them, to create and design the value that a company will offer to customers (Smith, Colgate, 2007).

2.2 Value attributes

The primary dimension of value attributes for a customer is their importance, usefulness, beneficial effect for the customer. Lošťáková (2009) emphasizes that it is necessary to know the customer´s demands, ie. to identify attribute values for the customer, but also to find out how important and beneficial they are for them. Kotler and Keller (2006) recommend the implementation of a more stages process of analyzing the value by identifying the customer´s characteristics, and benefits the customer values. The above quoted authors suggest the following step to be a segmentation and finding out how customers value the individual attributes of the value of competing companies. Customer´s ideas and preferences can be very different from the perception of the importance of the producer´s offer parametres. Smith and Colgate (2007) divided customers' value into four cathegories.

Functional-instrumental value cathegory includes whether a product or service has precise features, functions, quality, aesthetics, etc., the correct function, performance, reliability, service level, servce support, and whether their use is effective. Another important attribute is the impact on the environment and how much it costs. The experience-hedonic value cathegory expresses how a product or service supports customer´s emotions, experiences, feelings like joy, confidence, or encouragement of curiosity or surprise. The cathegory of symbolic-expressive attributes expresses the degree of psychological significance of a product or service as a feeling of social prestige or expression of life style. A set of attributes related to "sacrifices" is associated with the cost of the purchase, owning and using the product and efforts to minimize the costs, the price, the product use expenses and to offer comfort, minimalizme psychological stress and the customer´s personal input associated with time consuming purchases, to reduce the effort and the energy to buy and use the product or to offer warranties and the possibility of returning the product.

2.3. The strategy of customer relationships on the market of long-term consumer goods

Long-term consumer goods are goods that are not frequently purchased. It is intended for longer and repeated use in the household, it´s usually stated to last at least three years. While fast-moving goods are purchased when they are consumed, long-term goods have a considerably longer service life and a buying frequency. Customer relationship management strategy in the consumer market has been a focus of interest in recent years. According to Palmer, Lindgreen and Vanhamme (1995) the strategy can be expected to be applied to goods where there is a risk of uncertainity connected with the purchase and the use. Franwick, Porter and Crosby (2001) argue that the application of the strategy can be expected more in the case of commodities, where the purchase involves a complex decision-making process.

According to O´Malley and Tynan (2000), customer relationship building is possible where goods are purchased with high interest, there is a non-elastic demand for the goods and there is a series of interactions between the producer (seller) and the customer. Sorce and Edwards (2004) implemented a research to illustrate how customers percieve "relationships" with the producer. Significant attributes included empathy as an expression of individual attention by the company, personal knowledge of the customers and their needs, a certain length of mutual contacts, and the ability to adapt in terms of service of the willing employees and product delivery, which the authors of the study generalized in the term "unique services for customers". Other attributes of relationship included respondents getting the product they are satisified with according to their requirements and expectations.

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They considered an easy, open communication focused on solving possible problems and highlighting news in the goods and services an important attribute, too.

The importance of selected attributes of wooden furniture for customers has been dealt with in several studies. Rammetsteiner, Oberwimmer and Gschwand (2007) presented the results of 13 representative national studies, mostly with with regional focus. Based on the research implemented in five European countreis, the purchasing criteria for buying wooden furniture are similar, although the order of their importance varies from country to country. The attributes of quality, durability, appealing shape and material, and a good price are considered the most important buying criteria, regardless of the type of furniture purchased. The environmental aspects were assessed as less important. Even less significant were the attributes of fashionability, exclusivity or domestic origin. However, the availability of information on the type of wood and its origin has a positive effect on buying behaviour. Further research in European countries has shown that consumers demand good quality especially for the furniture used in the kitchen, bedroom and living room, and they consider the quality of design, comfort, durability and functionality the main components of the offer. The good quality of wooden furniture is usually associated with the kind and the type of wood. The importance of quality increases with the expected product life of the furniture. The ranking is a result of the average rating and according to the authors of the study does not reflect the attitudes and the views of specific customer segments. Regional researches that have been carried out in individual countries include sets of similar purchasing attributes, although with different order of importance.

While in Bulgaria the four most important attributes included price, durability, design and functionality, consumers in Slovakia and Croatia considered the attributes of material and price more important than price. Consumers in Sweden consider the environmental characteristics and environmental impacts of furniture production to be very important attributes. The authors of the study (Rammetsteiner, 2004) comment on the findings as being more generally valid than as reliable and accurate specifications of attitudes and consumer behaviour. It is clear that in the studies carried out so far, attention has not been paid to customer value components that are now centered on customer value-oriented market. Ozzane and Smith (1995) identified the design, type of the wood an price as the main shopping attributes. According to Kotler (2007), companies can use the marketing research methods to find out what features the consumer percieves as the most important and the most ideal within a particular cathegory of products and services, and according to the findings, they can direct the marketing strategy for each specific segment of customers to fullfill their special wishes, needs and interests.

3. Experimental part

It is clear that the basic prerequiste for forming and maintaining relationships with customers is the knowledge of what benefits the customers want and prefere. It is therefore about bringing the customers a valuable way of addressing their needs and requirements, accompanied with a set of services and different type sof support. This kind of information should be obtained with regards to the relations and context of the particular field and business, and it can be information about design, packaging, advisory services, range of guarantees, reliability, supplies, etc. To identify the importance of individual supply components for customers and other determinants of their purchasing behaviour, a survey was carried out in May 2017 by Kubeš (2017). The method of electronic questionning was used to address 2,400 customers of the company, who realized a purchase of furniture at the selected company form January 2016 to May 2017. A total of 195 completed questionnaires were obtained back. A set of 15 bidding attributes and 9 supply information sources was compiled through individual interviews with marketing and sales staff, who are in daily contact with the end customers, and using the knowledge that is presented in the theoretical part of this article. The questions identified the importance of each bidding factor for purchasing decisions using a 5 point scale of importance. The Table 1 shows the codes for the individual positions of the scales used.

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Table 1. The scale of the factor importance

Very important 11	Rather important 12	Neither important nor unimportant 13	Rather unimportant 14	Completely unimportant 15

Source: author

The questionnaire included not only questions about age, sex, the size of the residence and education, but also open questions directed to the topic of purchasing and using purchased furniture. The evaluation of questions focused on other determinants of buying behaviour is not part of this article.

Due to the nature of the research, the individual questions are described using frequencies (relative rates, modus, median, and quantum rates were used). The chi-quadrate and median test were used to identify dependencies between respondents´ views and selected descriptive characteristics. If chi-quadratic differencies were identified by differencies in opinions, or actions of the individual cathegories of respondents, these differencies are statistically significant at the chosen level 0.05. The structure of the assessment of the individual components of the offer is different from the customer´s point of view, see Tab. 2a, 2b.

Table 2a. The Importance of Each of the Components of the Offer for Satisfaction with the Purchase of Furniture

The attributes of the offer	Relative frequencies of levels of importance for customers (%)				
Importance	Very important (11)	Rather important (12)	Neither nor (13)	Rather unimportant (14)	Completely unimportant (15)
wide range of furniture	17,4	36,9	16,4	22,1	7,2
different designs	25,1	50,3	3,1	10,3	11,3
high quality	45,1	34,9	1,5	7,2	11,3
architect´s advice	8,7	25,1	35,9	22,1	8,2
professional level of staff	37,9	39,5	4,1	6,7	11,8
willingnes, kindness of staff	54,9	25,1	1,5	3,1	15,4
quality printed catalogue	12,3	32,8	27,2	20,0	7,7
detailed information online	22,1	43,1	15,9	12,8	6,2
recommendation of furniture care	13,3	40,0	23,6	16,9	6,2
individual tailoring	30,3	43,1	7,7	10,3	8,7
home installation	24,1	36,9	14,9	12,3	11,8
availability of the store	19,0	41,5	21,5	9,2	8,7
loyalty programme	3,6	19,0	35,9	22,1	19,5
first purchase discount	5,1	25,6	31,3	22,6	15,4
design using computer visualisation	12,8	31,3	28,2	16,9	10,8

Source: author

Table 2b. The Importance of Each of the Components of the Offer for Satisfaction with the Purchase of Furniture

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The attributes of the offer /importance	Modus	Kvartils		
		25	50	75
Importance				
wide range of furniture	12	12	12	14
different designs	12	11	12	12
high quality	11	11	12	12
architect´s advice	13	12	13	14
professional level of staff	12	11	12	12
willingnes, kindness of staff	11	11	11	12
quality printed catalogue	12	12	13	14
detailed information online	12	12	12	13
recommendation of furniture care	12	12	12	13
individual tailoring	12	11	12	13
home installation	12	12	12	13
availability of the store	12	12	12	13
loyalty programme	13	13	13	14
first purchase discount	13	12	13	14
design using computer visualization	12	12	13	14

Source: author

It is clear from the results presented in the above tables that the attributes of the high quality of the furniture design and the willingness and kindness of the staff were the most often regarded as the very important for the customers´ choice and satisfaction. The willingness and kindness of the staff were regarded as very important even more often than the professional level of the staff. Individual furniture tailoring, which was mentioned as very important by 30 percent of the respondents, is related to the trend of customer service individualization and offering exactly what the customers want and expect. This fact is also supported by the frequency of importance of the attribute different designs, where the customers are offered a variety of wood types, surface treatments and even upholstered furniture finishes. It is ineteresting that offering a wide range of furniture is not very important for customers. On the contrary, the least frequent components of the offer were the loyalty programme, the first purchase discount or the architect´s advice.

After summing up the frequencies of the very important and important responses, the following order of the offer components importance was found out: high quality of furniture design, willingness and kindness of staff, professional level of staff, different designs, individual tailoring, detailed information online, more than 60 percent of customers suggested home installation very important. On the other hand, the loyalty programme and the first purchase discount were shown as the least important for customers´ choice and satisfaction. The design using computer visualisation (44% in total) proved to be more important than architect´s advice (rather important or very important for 33% of customers). The most neutral responses (neither important nor unimportant) is connected to architect´s advice (35%), loyalty programme (35%), first purchase discount (31%) and quality printed catalogue (27%).

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Table 3. Relationship between the Importance of Characteristics and Selected Descriptive Characteristics of Respondents (Consensus of the Distribution)

Question about importance	Characteristic	Test type	Asymp. Sig.	Monte Carlo Sig.	Descriptiton
High quality	Age	Chi-square	0,018	0,024	The higher the age the more important the quality
Architect´s advice	Age	Chi-square	0,000	0,000	The higher the age the more important architect´s advice
Professional level of staff	Age	Chi-square	0,003	0,004	Proffesional level of staff is the most important for the age group 55 and higher
Quality printed catalogue	Education	Chi-square	0,001	0,001	The higher the age the more important quality printed catalogue. It is the least important for the age group 35 and less
	Education	Chi-square	0,036	0,035	. For the respondents with secondary education quality printed catalogue is very important
Loyalty programme	Education	Chi-square	0,042	0,041	Loyalty programme is more important for respondents with secondary education
Design using computer visualisation	Size of the residence	Chi-square	0,031	0,030	It is the least important for inhabitants of villages up to 999 inhabitants, the most important for inhabitants of towns populated 1000 to 100 000 inhabitants

Source: author

The opinions of the importance of the bidding attributes for the selection and satisfaction differed only for five out of the total 15 attributes, see Table 3. Based on the used characteristics, it can be said that the main source is the respondent´s age, the education, and somewhat surprisingly size of the residence. To communicate with customers, it is important to know which source they consider the more or less important.

Customers can search for information from different sources. Deeper search can result not only in gaining a higher level of benefits and risk reduction, but also more confidence in the purchase. External sources include advertising, the Internet, social media, sales brochures and interpersonal resources such as family friends. Literature sources quoted in the theoretical part suggest that the importance of personal and non-personal sources will vary. A summary of the views of the sources of information before purchasing furniture is given in the Table 4.

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Table 4. Sources of information before and during the purchase of furniture

Information before purchase	Modus	Quartiles		
		25	50	75
-TV commercials	5	4	4	5
-TV programmes	5	3	3	5
-web pages	2	2	2	3
-adds	4	3	4	5
-social network	5	3	4	5
-catalogues, brochures	2	2	2	3
-friends and their experience with furniture at home	2	2	2	3
-recommendation of family and friends	3	2	3	4
-sellers´advice	2	2	2	3

Source: author

Generally, personal sources can be considered the most used information sources before purchasing furniture, especially sellers´ advice right in the shops, friends and their experience with furniture at home. Non-personal sources include producers´ web pages, catalogues and brochures. On the contrary, the least used are TV commercials, magazine adds and social networks. Looking at the structure of responses, it has been found that using TV as a source of information differs depending on the gender and education of the respondents, see Tab. 5.

Table 5. The Relationship between the Use of Information Sources and Gender and Education

Question	Describing Characteristics	Test Type	Asymp. Sig.	Descrption of differences
TV programmes as a source of information	Gender	Chi-square	0,001	Women use TV programmes about living as a source of information more often than men
	Education	Chi-square	0,003	Respondents with secondary education watch TV programmes about living more than respondents with university education

Source: author

A significant trend today is the use of modern technologies while communicating with the customers. In order to find out the respondents´ views on the use of the Internet for collecting information, realization of the purchase and finding out the content requirements for furniture on the Internet, four questions were formed. Based on their evaluation in Tab. 6 it appears that the Internet is primarily used as a source of infromation about furniture in general and to get a general overview before the purchase in a brick and mortar shop.

Table 6. Opinions about Finding Information and Purchasing Furniture on the Internet

	Median	Quartiles		
		25	50	75
Internet as a source of information about furniture	2,00	1,00	2,00	2,00
Using the Internet before purchase in the brick and mortar shop	2,00	1,00	2,00	2,00
Demand of easier and wider offer on the Internet	3,00	2,00	3,00	3,00
Presenting interiors on the Internet	2,00	2,00	2,00	3,00
Buying furniture on the Internet (YES, NO)	2,00	1,00	2,00	2,00

Source: author

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The respondents would also welcome presentations of interiors on the producer´s websites, the current view on an easier and wider realization of purchase through an e-shop is generally neutral. This may be due to respondents´ lack of experience in this field. To verify this assumption, the relationship between opinions of respondents who have already realized the purchase on the Internet and those who have not done so yet has been examined. Almost 60% of those who have already experienced buying furniture on the Internet agree with the demand of easier and wider offer and an easier realization of the purchase compared to 39% of the group of respondents who do not have such an experience yet. The results are shown in Tab. 7.

Table 7. The Relationship between Demand of Wider Offer on the Internet and Easier Purchase on the Internet and Online Shopping Experience

Question	Describing Characteristics	Test Type	Assymp. Sig.	Description
Demand of Wider Offer and Easier Purchase on the Internet	The Experience of Shopping Online (YES/NO)	Chi- square	0,006 df 4	The experienced online shoppers demand wide offer and easier purchase on the Internet

Source: author

Due to the growth in the proportion of online purchases, we can expect an increase in interest in purchasing furniture through e-shops in the near future. Furniture vendors must therefore pay much more attention to ways of presenting furniture on the Internet, visualizing home furniture solutions, developing distribution systems, and, last but not least, linking the information system to social networks as Facebook. According to the study (Wang, 2017) the usage of the social media into customer relationship management system can improve the company performance. For our business, it means not only to expand the offer for internet sales, enhance the ability to deliver goods including application services, to offer other products in the moment of the delivery. The interconnection of management information system with social media can build competitive advantage

4. The Limitation of the Research

The acquired knowledge is valid within a set of data obtained from customers of the selected company. Furthemore, the research was based on the size of the group of respondents who agreed to cooperate. From the magnitude of the achieved statistical characteristics it can be concluded that larger files could be uncovered and further connections between them could be found.

Conclusion

The starting point was the study of the current state of the customer relationship management strategy concept, which emphasizes not only acquiring new customers, but mainly maintaining the current ones. In the industrial and commodity markets, this trend is provable. The question is wheter this trend fully applies also with the long-term consumption goods, in particular in the wooden furniture market, where the average life-expectancy is about 15 years and with upholstered furniture it is 11 years.

Due to this it is not possible to fully accept the current goal of a customer-oriented strategy, to keep the current customers. For companies operating in a limited market, such as in the Czech Republic and Slovakia, it is necessary to combine the strategy of maintaining with the strategy of acquiring new customers. Keeping the customer for more than 10 years and 5 years for upholstered furniture customers requires tools different from short-term consumers' goods. One way to achieve this is combining long-term consumer products with short-term

consumer products, specifically housing accessories with short purchasing cycles. Emphasis should be placed on those components of the importance value, which has been identified through this research. Permanent contact with a customer is also important for acquiring new customers in this area. Given that the customer relationship management strategy on the long-term commodity market has not yet been the subject of more attention, an ongoing research can enhance knowledge in this area.

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APPROACH TOWARDS FEMALE AFRICAN MIGRANT ENTREPRENEURSHIP RESEARCH

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Abstract. This paper sets out my rationale and objective, the motivating factors, methodology, types of data collection and analysis. The purpose of the research is to investigate and analyse the entrepreneurial experiences of Migrant African Women Entrepreneurs (MAWEs) in Regional Queensland whose businesses depend on tourism. This study is inspired by my personal experience as a migrant African woman and informed by my doctoral study in progress. Having migrated from Africa to Australia seven years ago, I noted numerous aspiring entrepreneurs among migrant African women and developed an interest in learning more about the experiences of this group, and a concern regarding the extent of their needs. The objectives are to explore MAWEs' motivation, identify the factors that enable them, the barriers they encounter and the challenges they face. This will involve excavating the role of formal and informal learning practices. Tenets of feminist theory are used to examine opportunities for formal adult education, peer-to-peer learning, and work experience that facilitates the establishment and sustainability of small business. As an insider, I can provide insights and give the participants a voice by articulating their observation and encouraging the growth of small business which contributes to the economy of regional Australia.

Keywords: women; entrepreneurship; standpoint theory

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1. Introduction

The current Australian Government's policy has been promoting small business entrepreneurship and innovation (Australia Government, 2015).The Global Entrepreneurship Monitor (GEM) survey reports that Australia is an innovation-driven economy (Kelly et al., 2011). My research concentrates on migrant women who are included in the government's commitment to providing ongoing support for mentoring, education and training. The involvement in my family's business, in both Africa and Australia, has enabled me to experience the complexities

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of starting and operating a small business. I observed the demands and differences from two contrasting cultural positions. The topic suggests that the most appropriate form of feminist analysis for this research is Standpoint theory and the study focuses on an area of migrant experience that is not adequately researched.

Research question. What is the most appropriate form of feminist analysis for research into African migrant women entrepreneurship?

2. Review of literature

Migrant women entrepreneurship

According to the Organization for Economic Cooperation and Development (OECD, 2013), research in entrepreneurship is a growing area in educational and social research. There is increasing recognition of the relevance and importance of entrepreneurship for migrant women from developing countries who have settled in developed economies and aspire to become successful business owners (Poggesi et al., 2015). Nevertheless, there is limited literature on the subject. Most migrant entrepreneurs are male, yet their business dynamics often depend on the unpaid and unacknowledged support of their wives and family members (Collins & Low, 2010). Bird and Brush, (2002) argue that feminine skills are often ignored or excluded in the entrepreneurship literature. Although this varies from country to country (Collins, 2003), it is a significant issue in Australia because, increasingly, women are becoming entrepreneurs in their own right. A body of literature on women entrepreneurs retains the notion that the entrepreneur or entrepreneurship exists independently of the person doing it (Galloway, Kapasi, & Sang, 2015). Ogbor (2000) argues that the general concept of entrepreneurship emerges as fundamentally more masculine than feminine, and more heroic than cowardly. In this context, males are seen as the archetype of entrepreneurs whereas females, at best, are confined to what Bowen and Hisrich (1986) term as 'entrepreneurial ghettos' (p. 394). Ogbor asserts that traditionally, female participation is the antithesis of entrepreneurial norms because of the following gender inequalities: male dominance versus female submissiveness, male independence versus female dependence, and male achievement versus female subjugation.

Barriers and challenges

According to Collins and Low (2010), to survive economically, migrant women often start their own small businesses because they are unable to access the mainstream labour market. In the authors, personal experience, typical examples of retail businesses include the selling and braiding of hair, dressmaking, artefacts, and supply of African foods and clothes.

Reluctance or inability to branch out to more diverse enterprises may be due to a different regulatory environment, restrictive government regulations, institutional orientations, and lack of proper networks. Other factors include lack of familiarity with the Australian business environment, taxation and legal requirements, lack of capital, exposure to different social networks, and lack of local knowledge, culture and language (Collins, 2008).

Self-employment promotes self-sufficiency and is a means to rise above poverty and marginalisation. The contribution of migrant entrepreneurs to the Australian economy is an area where comparative international knowledge is evolving but underdeveloped (OECD, 2010) while, Collins and Low (2010) study contend that migrant women from developing countries who settle and start their ventures in developed economies are not well studied.

Informal adult education

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Adult learning (peer-to-peer) is a personal process shaped by the context of adult life and the society in which one lives (Merriam et al., 2012). Entrepreneurial learning focuses on the knowledge, skills, abilities, and attitudes of actual or potential entrepreneurs (Erikson, 2003). Knowledge acquired through adult learning is centred on the cognitive processes related to acquiring, storing, and making meaning of new information (Merriam et al., 2012). Schugurensky (2000) proposes three forms of learning: self-directed which is intentional and conscious, incidental, and social, or tacit. Types of informal learning differ among themselves in terms of intentionality and awareness at the time of learning (Merriam et al., (2012). This study will specifically research informal learning that embraces activities such as learning from other businesswomen, family, friends and co-workers, on-the-job learning, engaging in business mentoring, and learning through trial and error (Dawe & Nguyen, 2007). Informal learning provides migrants with foundation skills to integrate into their new communities, upon which further learning can be built. Small business owners learn through doing, and much of their learning is focused on current or real issues contextually embedded in their environment (Dawe &Nguyen, 2007).

Research methodology

Case study methodology and feminist theory sit well together because both focus on illuminating participants' lived experiences. Qualitative research is best suited to obtaining a rich description of a phenomenon from the viewpoint of the people who experience it (Oakley, 1998 & Creswell, 2014). Yin (2014) describes a case study as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context" (p. 16). According to Creswell (2014), case studies "are a qualitative design in which the researcher explores in depth a program, event, activity, and process, or one or more individuals" (p. 241). Qualitative methods are appropriate for feminist research to reveal and understand subjective experiences of women in contemporary society (Depner, 1981). Respect for the experience and perspective of the other is upheld, with feminist researchers expressing commitment to "realising as fully as possible women's voices in data gathering and preparing an account that transmits those voices" (Olesen, 1994 p. 167).

According to Creswell (2014), the researcher will be the primary data collection instrument, and this necessitates identifying personal values, assumptions, and biases at the outset of the study. The researcher's worldview is a collection of beliefs, a definition of self, and relationships that occur within the world. These beliefs influence and inform the design and conduct of a research project (Creswell, 2014). Clear justification of methodology and methods, together with the explanation of the underlying theoretical perspectives and epistemology, ensures a strong research design and ultimate convincing outcomes of research (Crotty, 1998). A case study methodology will be employed to gain a deep understanding of participating women. Based on my reading of Yin (2014) and Creswell (2014), this is best achieved using MAWEs as informants in an interview situation (Patton, 2002).

This research draws upon a qualitative study in progress, which aims to understand small business entrepreneurship among migrant African women in North Queensland, a feminist study of lived experience, motivation and learning. In this study, there is a need for migrant women to have entrepreneurial skills and abilities to enable them to deal with life's challenges and an uncertain future. Henry et al. (2005) argue for the need for education because entrepreneurs will benefit from learning an innovative approach to problem-solving, adapting to change, becoming more self-reliant and developing their creativity.

Feminist approach

Data collection methods will include transcripts interviews, surveys and documents. All the data collected from the documents, surveys and transcripts will form the text for analysis.

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Given (2016) argues that a feminist lens may be used where thematic analysis and coding process contribute to feminist theory. Viewing entrepreneurship through a feminist lens opens up avenues for innovative methodological approaches beyond the conventional methods employed in the majority of research (Galloway et al., 2015). The ultimate aim of the feminist research is to 'capture women's lived experiences in a respectful manner that legitimises women's voices as a source of knowledge' (Campbell & Wasco, 2000, p.787). Feminist research has from its early stages been engrossed with the politics of knowing and being known according to Lather (1992). The researcher is motivated by, and concerned with, promoting social justice for women and brings feminist knowledge to the research process (Morris, 2016). Feminist research focus is sharply on gender domination and discrimination within patriarchal societies (Polit & Beck, 2014).

Ahl and Marlow (2012) have advocated a feminist approach to interpret entrepreneurship. Ahl (2006) argues there is a need to use a feminist perspective to examine the gendering of entrepreneurship and entrepreneurs, rather than merely regarding gender as a variable in quantitative investigations. Feminist social research has often been equated with a woman-to-woman, sensitive style of qualitative interview, observation or life history, or one that involves research participants in the production of knowledge (Ramazanoglu & Holland, 2002). Ramazanoglu and Holland, (2002) argue that feminist knowledge of gender should include practical social investigation of gendered lives, experiences, relationships and inequalities.

Harding's (1987) position demands that we should learn to look more closely at what makes the most influential feminist research so powerful. She suggests studying women from the perspective of their own experiences so that they/we can better understand our situations in the world. Research should be designed for women instead of simply about women. The feminist perspective enables the researcher to probe issues of the power relations between researcher and researched, objectivity versus subjectivity, and found versus constructed worlds (Lather, 1992). Feminist research values and prioritises the voices and experiences of women (Beckman, 2014).

In fostering understanding of women's experiences, feminist perspectives also 'carry messages of empowerment that challenge the encircling of knowledge claims by those who occupy privileged positions' (Hesse-Biber, 2012, p 3). As a feminist researcher, I assert that migrant women's voices have been traditionally silenced or distorted. As stated by Gray (2014), my aim, as the researcher is to understand the experiences of MAWEs, my own experience, and my influence on the research. Feminist research is actively engaged in challenging inequalities or injustices and improving women's lives (Gray, 2014).

As Holland & Ramazanoglu, (2002) note, feminist knowledge of women's lives cannot be assumed or generalised without qualification and empirical investigation. Haraway (1991) explains that to move towards feminist objectivity, knowledge has to be situated.

According to Hjorth et al. (2004) study, feminist perspective is thus necessary for studies on entrepreneurship to avoid taking a prevalent masculine norm for granted and to be able to make women entrepreneurs visible. Feminist research is not just on women, but for women and, with women (Fonow & Cook, 1991). Harding (1991) also states that by using feminist theories as a conceptual lens, a more inclusive social research practice can be created.

The data gathered will be analysed using a conceptual/theoretical framework of thematic analysis (Braun & Clarke, 2013) and Feminist standpoint theory (FST) — Dorothy Smith and Sandra Harding (2004) are the pioneers. Feminist epistemologies include feminist empiricism, feminist standpoint, and feminist postmodernism (Harding 1991). Feminist standpoint theory claims that the only way of knowing a socially constructed world is to know it from within (Smith, 1997). The very notion of standpoint would be the act of interpretation; one that puts

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the positioning of "outsider-within" to work (Collins, 2004). I will be drawing on Haraway's suggestion of a gift of vision; of the situation as a visual tool.

Feminist Standpoint analysis

This study draws on standpoint theory (Harding, 1991) and situated feminist knowledge (Haraway, 1988). Bhavnani (1993) proposed set criteria against which any social scientific inquiry can be evaluated for its claim to be feminist (as cited in Handforth & Taylor, 2016). Ahl et al.,'s study (2006), was based on feminist analysis of women's entrepreneurship, and Brettell (2007) researched immigrant women in small business following their biographies of becoming entrepreneurs. Feminist scholars working within some disciplines such as Dorothy Smith, Nancy Hartsock, Sandra Harding, Patricia Hill Collins, and Donna Haraway have advocated researching women's lived experiences.

Feminist standpoint theory is useful in understanding some of the facets of marginalisation that migrant African Australian women entrepreneurs face. In accordance with the views of Harding (2004), I will seek to do the work of excavating, shifting the focus from the theoretical concerns in the debates on the tensions between feminism, and marginalised African migrant entrepreneurs to the voices of the women rendered vulnerable by these debates. Standpoint theory is based on the assumption that those experiencing intersecting inequalities have adequate knowledge about it and thus should be the subjects of inquiry (Carastathis, 2014). Growth in women migrant entrepreneurship in Australia suggests a need for policies to be sensitive to matters related to the intersection of ethnicity and gender (Collins, 2008). Davis (2008) defines intersectionality as the "interaction between gender, race, and other categories of difference in individual lives, social practices, institutional arrangements, and cultural ideologies and the outcomes of these interactions in terms of power" (p.68). The author's choice to include intersectionality in this study is an appropriate framework for analysing the experiences of women, because the complexity of their experiences will be examined from gender, class, and race perspective.

A feminist standpoint, achieved through struggle both against male oppression and toward seeing the world through women's eyes, provides the possibility of more complete and less distorted understandings (Lather, 1992). I will adapt Hennessy (1992) idea that, the application of feminist standpoint will help shape structures of power, work and wealth when it is conceptualised into reality from the vantage point of MAWE's lives. Feminist thinking and practice require taking steps from the 'margins to the centre' while eliminating boundaries that privilege dominant forms of knowledge building, boundaries that mark who can be a knower and what can be known' (Hesse-Biber, 2012, p 3).

Hartsock (1992) defines standpoint feminism as the attempt to develop the methodological base provided by Marxian theory; an important epistemological tool for understanding and opposing all forms of domination. Standpoint theorist Sandra Harding (1993) argues that science is socially constructed. Hennessey (1992) affirms that feminist standpoint theory empowers women's ways of knowing. According to Hesse-Biber (2012), standpoint theories, feminist empiricism, postmodernism, and transnational perspectives all recognise the importance of women's lived experiences in the quest of excavating subjugated knowledge. Dorothy Smith (1987) stresses the necessity of starting research from a woman's perspective. Smith also claims that women's accounts of "daily/nightly" experience, as its ground for knowledge (Dorothy Smith, 1997, p. 394).

Structuralism and poststructuralism

Poststructuralist feminists have questioned the authority of the data documented by feminist standpoint theory. By looking at the difference between standpoint and poststructuralist perspectives, the researcher gains a more complex and theoretically richer set of explanations of the lives of the oppressors and the oppressed (Hesse-Biber,

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2012). Gough and Whitehouse, (2003) argue that the "feminist poststructuralist approach can be very informative and revealing of certain dimensionalities that may otherwise be ignored or silenced within the field" (p.9). Poststructuralist theorists critique Standpoint theory as, "the knowledge project which assumes that correctly produced knowledge will lead to the adoption of the best political strategies"(Andermahr et al., 1997).

In my reading of feminist standpoint theorists and poststructuralist feminists, a consistent difference is that the former are studying knowledge that is not legitimated by masculine domination whereas poststructuralist feminists are explicitly studying the discursive formations that shape social relations and knowledge. However, I would argue that both groups of theorists are studying structures of power in general, and both have a political goal, precisely the liberation of women in an egalitarian society. Generally, both groups have a similar object of study—power and knowledge, but the approach of poststructuralist researchers concentrates on the language and meanings that underlie the "ontological and epistemological understandings" (as Cited in Gough & Whitehouse, 2003).

Study Locations

Knight (1921), and Basu and Altinay, (2002) claim that the motives that drive people towards business entry and self-employment are profit, desire to take a risk, and a spirit of adventure but the assumption that all the businesses established by MAWEs are driven by growth and profit maximisation objectives is questionable (Lee-Ross & Ashley, 2009). These aspects will be investigated in the research. Tourism, and leisure industries are primarily located in attractive regions, where there is a much higher concentration of lifestyle entrepreneurs, and this is often the primary motivation for entrepreneurial activity (Peters et al., 2009). The project study areas, Cairns and Townsville, are hubs for tourism and are popular travel destinations for foreign and local tourists because of their tropical climate.

Multiple sources of data collection

Oakey (1998) argues that methodology has been gendered but it is possible to conduct feminist qualitative research using a range of research methods. The study employs the Gray (2014) methodology that is grounded in the interpretivist–constructivist paradigm, which offers a flexible research design that requires placing the person experiencing the phenomenon central to the study. Reinharz and Davidman 1992 argue that feminist researchers should be careful to differentiate their own experience from the experience of other women while valuing their personal experience. Olesen (1994) states that respect for the experience and viewpoint of the other women is maintained, with feminist researchers totally committed to realising women's voices in data gathering entirely, and conveying those voices. Reinharz (1983) too argues for positioning feminist research within qualitative traditions of social inquiry. The feminist methodology is shaped by feminist theory, politics, and ethics, and grounded in women's experience (Ramazanoglu & Holland, 2002).

Oakley (1998) states that qualitative methods are considered non-scientific, and associated with interpretivism, subjectivity and femininity but the use of multiple sources of data collection is a significant strength of the case study approach (Burns, 2000). Multiple sources allow for triangulation through converging lines of inquiry. Corroboration makes a case study report more convincing (Burns, 2000). Different data collection methods will be utilised in this study and will use document study, site visits, group and individual interviews, which will include a survey questionnaire in order to strengthen the validity and reliability of the findings. Document study will include official and public documents, organisational documents, newspaper articles, and government reports. These will be sourced to give the researcher a broad understanding of the migrant entrepreneurial context. The site visits will be conducted to observe the nature of the business, the environment, customer interactions,

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employees, and working dynamics of the business. This will allow the researcher to contextualise the participant in her place of business. Combining site visits with in-depth individual interviews would be sensible and practical.

Five focus groups in each city will be conducted, with the aim of bringing the participants together for productive conversation. A semi-structured interview guide will be used for the group interviews to ask the participants questions about their experiences of entrepreneurship in Australia. Small groups of a minimum of four participants will be organised, lasting approximately one hour. Interviews will be recorded and transcribed and may take place at any location that suits the participants. These groups encourage participants to talk to one another. The data generated is valuable, but the informal exchanges that arise during general interactions are equally essential. Wilkinson and Morton (2007) argue that the focus groups are relevant to feminist research because they are a contextual method. They avoid focusing on the individual, devoid of social context, or separate from interactions with others. Secondly, focus groups are a relatively non-hierarchical approach because they shift the balance of power away from the researcher towards the research participants.

In-depth, semi-structured individual interviews will be undertaken with five participants in each city, and these will include professional women in their own private practice or who are seeking to be such. Interviews will be conducted face-to-face and, like the focus groups will be scheduled at the convenience of the participant, at any location that suits them and will last approximately one hour. Interviews will be recorded and transcribed then returned to each interviewee for personal checking. This method will also be applied to interviews with five industry partners. In-depth conversations and group discussions serve as a medium to gain rich detail in the women's stories we seek to explore (Gray, 2014). Face-to-face interviews, mainly from a feminist perspective, allow for a degree of rapport, and can thus elicit meaningful information. Feminist researchers also contend that as women tend to be highly skilled in human interaction and conversation, interviews are well suited to feminist researchers (Reinharz & Davidman 1992, p. 20). A structured questionnaire will be developed to address demographic details at the same time as the interviews with open and closed questions set.

Conclusions

This research involves a topical study involving migrant African women entrepreneurs. The study illustrates guiding principles of a feminist theory, in which women's issues are central. The study objective reflects on how Feminist Standpoint Theory contributes to our understanding of migrant women entrepreneurs in North Queensland and their lived experience. The research focus is directed towards learning from the participants' experiences in all aspects of their lives, understanding their stories and the meaning they attribute to them. This study will generate empirical data on entrepreneurship and contribute to an expanding body of knowledge. It is hoped that the findings will illuminate the experiences and needs of MAWEs and potentially influence future policy.

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BARRIERS AND CHALLENGES EXPERIENCED BY MIGRANT AFRICAN WOMEN ENTREPRENEURS IN NORTH QUEENSLAND, AUSTRALIA

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Abstract. The purpose of this study is to explore and identify possible barriers and challenges experienced by migrant African women entrepreneurs in the establishment and operation of their businesses in North Queensland. The study adopts a qualitative approach and employs in-depth, semi-structured interviews and site visits to participants businesses. Findings revealed that cultural factors, family, human capital, social capital and networks, and institutional factors potentially acted as barriers to the establishment and operation and of their businesses. This is a small-scale pilot study. The data was gathered from eleven migrant African women only, in a specific region, so the results are limited in applicability and cannot be assumed to apply to other cultures. The context of the research might not be considered a representative of Australia. This study provides empirical data regarding the barriers and challenges encountered by migrant women entrepreneurs and contributes to a new body of knowledge, providing a foundation for further research in this area. The study also serves to inform policymakers.

Keywords: Migration, entrepreneurship, barriers, challenges

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JEL Classifications: O10, O15

1. Introduction

The issue of migrant entrepreneurship is important to consumers as well as entrepreneurs in general. Australia has a long history of migrant entrepreneurship, with many ethnic groups involved in small business sectors of the Australian economy (Collins, 2003). Entrepreneurship is fundamental to social integration, especially for migrants displaced from their home countries due to political, economic, and environmental factors. Women tend to bear

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much of the burden for re-establishing their families in a new country. The survival strategy of MAWEs aims to avoid poverty and the discrimination that can be encountered in the mainstream labour market (OECD, 2004). Migrants need regular and profitable employment and entrepreneurship benefits the individual and contributes to economic stability by building sustainable communities that are accepting of migrants. MAWEs represent a growing proportion of the self-employed, and many are now opting for autonomy and the return on investment that business ownership promises (Halkias, 2011). My research interest derives from personal experience and concern for fellow migrant African women in Australia. As a MAW, I am motivated to understand this situation as an insider better. The study investigates the barriers and challenges experienced by MAWEs in North Queensland in the operation of their businesses. The structured interviews focus on the experiences of migrant women who have been able to establish a business.

1.1 The research question

What are the possible barriers and challenges experienced by migrant African women entrepreneurs in the establishment and operation of their businesses in North Queensland?

2. Literature review

2.1 International migration: the female experience

International migration is a crucial feature of industrialised countries because migrants from less developed countries move to advanced economies (Kloosterman, 2003). Global migration across countries and continents is fuelled by global tragedies, globalisation trends, and the search for refuge and opportunities (United Nations [UN, 2005]) with women migrants being the majority (Evans, 1988). Simon and Brettell (1986) have indicated that women have been treated more as the wives of migrants than independent individuals, and their role in the migration process has been deemed less important. However, women now make up a significant proportion of the total migrating population and contribute significantly to the labour force of the settlement country (Evans, 1988). The significant increase in the female labour force throughout the world is, to a large extent, the result of female migration (OECD, 2005). There is an increasing number of people in Australia of African descent, bringing with them potentially valuable cultural, social and economic ties to the region (Negin & Denning, 2008) and the participants in this study are among them.

2.2 Migrant women entrepreneurs

Collins and Low (2010) note that migrants bring new skills to the Australian economy, provide flexibility in the labour markets and help address labour shortages. They contribute to the economy as employees and as entrepreneurs, creating new firms and businesses. Entrepreneurship is viewed as an alternative to unemployment. Migrants often start businesses as an economic survival strategy, because of their inability to access the mainstream labour market (Collins & Low, 2010). Importantly, economic necessity, social exclusion, lack of education and skills, high levels of unemployment, and language barriers push an increasing number of migrants towards entrepreneurship (OECD, 2004**).**

In my experience as a migrant African woman in Australia, many MAWEs start small businesses in their quest to become economically self-sufficient. They start the businesses to serve the consumer needs of fellow Africans and integrate into Australia culture and society. Examples of the types of small businesses that women establish are: hair braiding, dressmaking, and retail shops that sell imported African foods, clothes, hair and artefacts. Planning and creating a new business is complicated for those who prefer self-employment path.

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Generally, women in developing countries are commonly marginalised in societies that are already overwhelmed by poverty, underdevelopment, and face political instability (UN, 2006). Such women are likely to meet additional challenges compared to people with well-established businesses in developed countries. Collins (2008) suggests that this may be due to a different regulatory system, exposure to different social and institutional customs, lack of proper networks or familiarity with the Australian business environment. As Collins and Low, (2010) state, self-employment offers a means to rise above poverty and avoid marginalisation. He further concludes that the experience of migrant entrepreneurs is largely shaped by their histories, family background, and their human and financial capital.

According to the UN (2010), half of all migrants living outside their country of origin are women, most of whom are in their reproductive phase of life. Entrepreneurship gives them an opportunity to be participants and agents in the labour market, not only filling existing vacancies but also creating and strengthening their own jobs and social recognition (Kloosterman & Rath, 2003). The contribution of migrant entrepreneurs to the host-country economy is an area where comparative international knowledge is underdeveloped (OECD, 2010). Most migrant entrepreneurs are male, yet their business dynamics are often dependent on the unpaid and unacknowledged support of their wives and family members (Collins & Low, 2010). Increasingly, women are becoming entrepreneurs in their own right though this varies from country to country (Collins, 2003). There is limited literature on entrepreneurship among migrant African women in Australia, highlighting the need for an exploratory study. The study serves to inform aspiring migrant African women entrepreneurs in North Queensland, Australia and may inform policymakers.

2.4 Explanations of barriers and challenges experienced in the establishment of businesses

MAWEs as minorities face barriers concerning language, racism and prejudice that do not confront non-migrant entrepreneurs as also suggested by Collins (2008) study. Moreover, as Collins (2008) points out, fluency in the English language is advantageous in the labour market and provides entrepreneurial opportunities. The challenges experienced by migrant women entrepreneurs include cultural, family, human capital, social capital and networks, and institutional factors.

2.4.1 Entrepreneurial cultural factors

Nayab (2011) describes culture as customary practices and beliefs that have a significant impact on the fundamental values, perceptions, preferences, and behaviours of people. Culture can act as a barrier, depending on how it is perceived and utilised by entrepreneurs (Azmat, 2013). According to Kloosterman and Rath (2001), vibrant entrepreneurial culture in an adopting country reduces the number of openings available for potential migrant entrepreneurs, and for the newcomers, there are not many underserved niches to start a business. Home country cultural factors, which include values, attitudes, informal rules, religious beliefs and rules of conduct, are likely to have a strong influence on shaping the perceptions of ethics and social responsibility of individuals as well as of the society in the home country (Azmat, 2013). When the migrant entrepreneurs start their ventures in their host country, they face contrasting values, beliefs, attitudes and business practices due to different socio-cultural factors (Collins, 2003). Cultural traits like thrift, hard work and reliance on family labour, in some cases act as obstacles (Liversage, 2009).

2.4.2 Family factors

Changes in the concept of the role of women from homemaker to bread-winner are not always readily accepted by the family or even by the community (Azmat, 2013). Migrant women are almost always responsible for child-care and home management, these responsibilities often lead to work and family conflict (Das, 2012). Azmat (2013) in

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his study, argues that the expectation of women's family responsibilities underpinned by cultural norms acted as a significant barrier for migrant women entrepreneurs to venture into their own business. Constraints associated with commitment to traditional family roles and responsibilities are especially pronounced among migrant women.

2.4.3 Social capital and networks

A network is defined as the set of social relations or social ties among a set of actors who are linked (Sequira & Rasheed, 2006). Social capital refers to the benefits entrepreneurs derive from their social networks (Baron, 2015). Social capital can act as a barrier as Azmat (2013) points out. The reliance on informal networks can prevent women from having meaningful exchanges within business networks, thus limiting their opportunities to gain access to finance and other resources for the development and growth of businesses (Roomi, 2012).

2.4.4 Human capital

Human capital relates to the skills and knowledge which an entrepreneur acquires during her life through, for example, schooling, work experience, and training (Collins & Low, 2010). As far back as 1988, Coleman suggested that higher levels of human capital could reduce self-employment. Inadequate or inappropriate education and training are viewed as a barrier to hamper the move into entrepreneurship, particularly for women, and an obstacle to the growth and survival of existing entrepreneurs (Kermond et al., 1991). The lack of marketable skills or qualifications disadvantages migrant women when starting ventures in developed countries (Alcorso, 1989).
The lack of prior employment and managerial experience, faced by many women from developing countries, can disadvantage their attempts to enter markets of the host country (Lerner et al., 1997). Kloosterman (2003) suggests that migrants from non-industrialised nations, who start businesses in advanced economies, may lack both substantial funds (financial) capital and human capital (educational qualification), but can set up shop in specific segments of the urban economies that allow for small-scale labour-intensive, mainly low-skill production. Where there are low barriers to entry to the market, there is fierce competition, survival is difficult, and profits can be very low or non-existent in saturated markets.

2.4.5 Institutional factors

Farashah (2015) defines institutional factors as governmental policies, or the access entrepreneurs have to financial support. By learning through social interaction and by following codified and enforced laws and regulations, individuals in a society are affected by institutions (Farashah, 2015). There are three characteristics identified by the World Bank as essential indicators of doing business in a region: registering property, enforcing contracts and dealing with licences (OECD, 2014. The majority of migrants depend upon their personal savings as well as loans from relatives and friends (Sequira & Rasheed, 2006).

According to Kloosterman (2003), migrant women entrepreneurs from less-developed economies are hampered by a lack of financial capital or have difficulty accessing financial institutions. Collins (2008) outlines the institutional challenges as different regulatory environments, exposure to different institutional orientations, lack of familiarity with the Australian business environment, taxation and legal requirements, inadequate access to capital, and, restrictive government regulations. For female migrants, financial illiteracy is a barrier to their effective use of financial services, accessing income-generating opportunities, and enhancing personal wellbeing and social inclusion (Australia and New Zealand Bank [ANZ, 2003]). According to Hugo (2009), lack of understanding of Australian business regulations and difficulty in acquiring loans from financial institutions has a negative impact on migrant's women business opportunities.

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3. Research context and methodology

This research was undertaken within the North Queensland in Australia with eleven purposefully selected migrant African women entrepreneurs. To better understand barriers and challenges of the women, this study adopted a qualitative research methodology. "Qualitative research provides rich and detailed descriptions (Rather than 'counts' or statistical relationships) of people in action" (Lankshear & Knobel, 2004, p. 69). Purposeful sampling (Patton, 2015) was used to identify small businesswomen to participate in the study. The women identified satisfied the following criteria: Born in an African country, and migrated to Australia, aged 18 years and above, hold an Australian permanent residency or Australian citizenship, live in the Cairns region, and has a small business. The purpose of site visits is to observe the nature of the business, the environment, customer interactions, employees, and working dynamics. This will allow the researcher to contextualise the entrepreneur in her place of business. Combining site visits with in-depth individual interviews is sensible and practical. Data was collected through semi-structured and in-depth interviews, open and closed-ended interviews, and site visits. Participants were asked to talk about their personal experiences, opinions, and attitudes towards the barriers and challenges they face in the operation of their businesses. I intended to ensure that data gathered was information-rich to address the study aim. The conversation was audio recorded.

3. 1. Data analysis and interpretation

This study drew from Creswell's 2014 framework for qualitative data collection and analysis. I performed qualitative analysis with the aid of field notes and transcriptions of digital recordings of interviews. The interviews were transcribed verbatim (Braun & Clarke, 2013) and my recorded notes added to the data (also the suggestion made by Braun and Clarke). The research interviews drew on the participants' views. I listened to the women and coded the transcripts to reveal insights and build a picture based on data gathered. I sought to understand the reality of the women's experiences. To safeguard anonymity, every interviewed woman was allocated a pseudonym. The transcribed data in the form of text was imported into QSR NVivo 11. Using NVivo involved organising the transcripts into segments by taking text data and segmenting sentences into categories or themes (Creswell, 2014).

The analysis of interview transcripts was based on an inductive approach geared to identifying patterns in the data using thematic codes. Inductive analysis means that the patterns, themes, and categories of analysis come from data rather than being imposed on them before data collection and analysis (Patton, 2002 p. 453). The final step involved interpreting the information gathered. After structuring and presenting the interview data, I analysed the meanings of the coded data against the backdrop of my own culture, history and experiences and compared these findings "with information gleaned from the literature or theories" (Creswell, 2009, p. 189). The validation of the accuracy of the information occurred throughout the different steps of the research process. The analysis of this case study includes frequent and direct quotations from MAWEs in the Cairns region, providing them with a voice. MAWEs in the Cairns region.

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Chapter 4: Findings, analysis and discussion

4.1 Demographic details

Table 1. Participant's profile: Demographic data of the study participants

Participants	Region of origin	Age	Marital status	No of years in Australia
Abrielle	West Africa	39	Single	6
Callisto	Southern Africa	45	Married to an Australian	41
Emy	East Africa	41	Married to an Australian	14
Lana	Central Africa	31	Married to an African	5
Madilyn	Southern Africa	52	Married to an Australian	21
Mandube	Southern Africa	45	Married to an African	8
Patina	Southern Africa	43	Single	11
Purity	East Africa	48	Married to an African	8
Ramonita	East Africa	53	Married to an African	26
Reina	East Africa	49	Married to an African	6
Velvet	East Africa	69	Married to a Scotsman	41

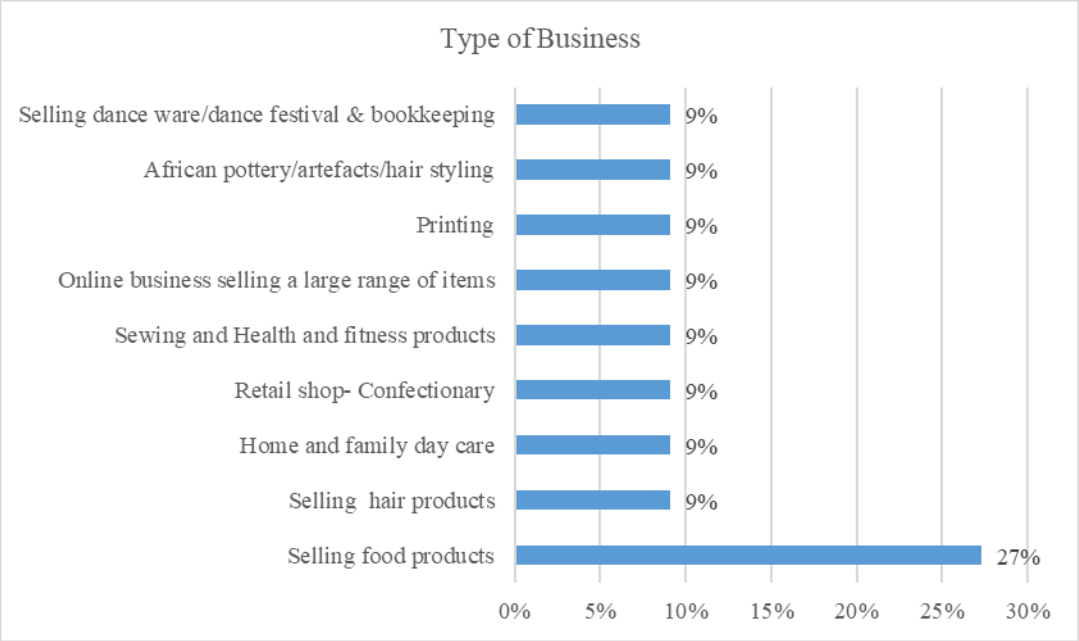
(**Pseudonyms have been used**)

The research study participants represent four regions in Africa. Only two women below the age of 40 years were engaged in business. Self-employment rates among the women migrants increased with the duration they lived in the settlement country. Six of the respondents had lived in Australia for over ten years, while five had lived in Australia for less than ten years.

Table 2. Participant's occupation in Australia

Respondent	Occupation in Australia	Location
Abrielle	Selling African palm oil, Tola sauce and hair products	Home
Callisto	Bookkeeping/selling dancewear/sewing	Commercial premises
Emy	Selling hair products plus office administration	Home
Lana	Home and family day care	Home
Madilyn	Retail confectionary (Selling sweets, chocolates, treats from around the globe.	Commercial premises
Mandube	Sewing, health & fitness business & teacher	Home
Patina	Selling household items online/teacher	Home
Purity	Haircare & hair products plus accounts officer	Commercial premises
Ramonita	Printing business	Commercial premises
Reina	Selling fresh fruits & vegetables & snacks	Home
Velvet	Manufacturing & selling African pottery/artefacts/hair styling & hair products	Commercial premises

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Graph 1. Types of businesses MAWES are engaged in.

Table 2 and diagram1 shows that the respondents were found to be active across a range of business areas, including retail (confectionery, dancewear, fresh fruits, vegetables and snacks, palm oil, artefacts), crafts (sewing, making and selling African pottery), bookkeeping, and health and fitness. All the respondents started up their own businesses. At the time of the interview, six of the eleven women had their businesses located at home while five were found in commercial premises.

Chapter 5: Findings, analysis and discussion

5.1 Barriers and challenges experienced by MAWEs in the establishment and operation of businesses in the Cairns region.

Table 3. Impact of marital status on the establishment and operations of their businesses

Pseudonym of the participant	Married to Australian non- Indigenous man -Level 1, Other marital status - Level 2	1 to 5 barriers -Level 1, 6 to 10 barriers - Level 2
Callisto	1	1
Emy	1	1
Madilyn	1	1
Purity	2	2
Ramonita	2	2
Reina	2	2
Velvet	2	2
Abrielle	2	1
Lana	2	1
Mandube	2	1
Patina	2	1

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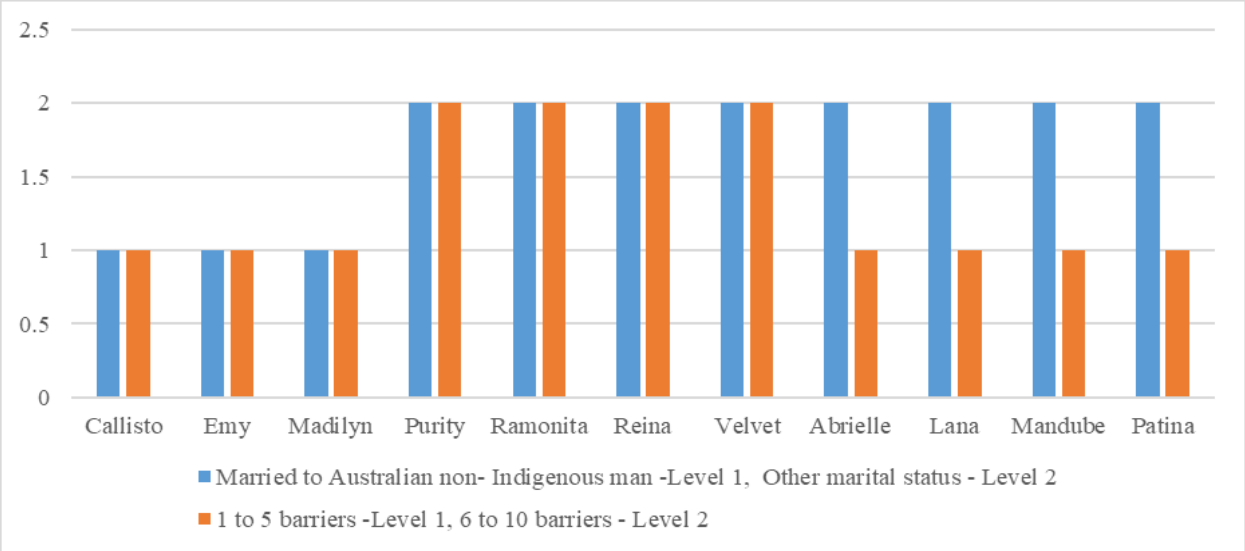


Diagram 2. Comparison between marital status and number of barriers to establishment and operations of businesses

Table 3 and diagram 2 above shows that all the three MAWEs married to non-indigenous Australians experienced 1-5 barriers. Four were single or married to migrants and experienced six to ten barriers.

My study suggests that MAWEs who are married to non-indigenous Australians experienced a lower number of barriers and challenges in establishing and operating their businesses compared to single and those married to migrants. Research by Collins and Low (2010) suggests that migrant women who start businesses in Australia structure their business life around their relationship with their husband, children, family and community, as well as their household responsibilities. Three women married to spouses born in Australia experienced one to five barriers in establishing and operating their businesses. Four women, single or married to migrants, experienced six to ten barriers. Four other women who were single or married to migrants experienced one to five barriers. Two of these women migrated to Australia with a working visa and integrated into the local community easily, and this could explain the lower number of barriers experienced.
This small study indicates that women who are married to spouses born in Australia experienced a lower number of barriers and challenges compared to single migrant women and women married to migrants. Collins and Low (2010) found that the majority of the Asian female migrants, whether married and living with spouses or unmarried, were also responsible for looking after the family regarding the household chores such as cooking and house cleaning, while at the same time attending to their businesses. This multitasking was Reina's experience. She said: *I work long hours and work on the weekends, I miss to connect with my children and husband, and sometimes when I need to be there for them.*

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The barriers and challenges experienced in the establishment and operation of businesses are grouped into the following categories (Table 4): cultural, family, human capital, social capital and institutional factors (see literature for explanations of categories).

Table 4. Key barriers/challenges and entrepreneurial categories

Key barriers and challenges experienced	Category	Frequency
Financial difficulties starting a business in Australia	Institutional factors	10
Inadequate support from Australian governments	Institutional factors	8
High rent/Difficult landlords	Institutional factors	6
Racial bias (affects marketing)	Cultural	5
Lack of understanding of legal requirements	Institutional factors	5
No information on Australian culture/ business /environment	Cultural	4
Inadequate support from Africans	Cultural	3
High transport costs	Institutional factors	3
Language/communication barrier	Cultural	3
Difficulty obtaining licences	Institutional factors	3
Balancing between work/children and business	Family	3
Lack of technical training	Human capital	2
Limited knowledge of financial management	Human capital	2
Different accent taken as inability to communicate	Cultural	2
Inadequate advertising	Institutional factors	2
High costs, e.g. wages	Institutional factors	2
A less favourable opportunity to become an entrepreneur compared to people born in Australia	Social capital & networks	1
Lack of good networks	Social capital & networks	1

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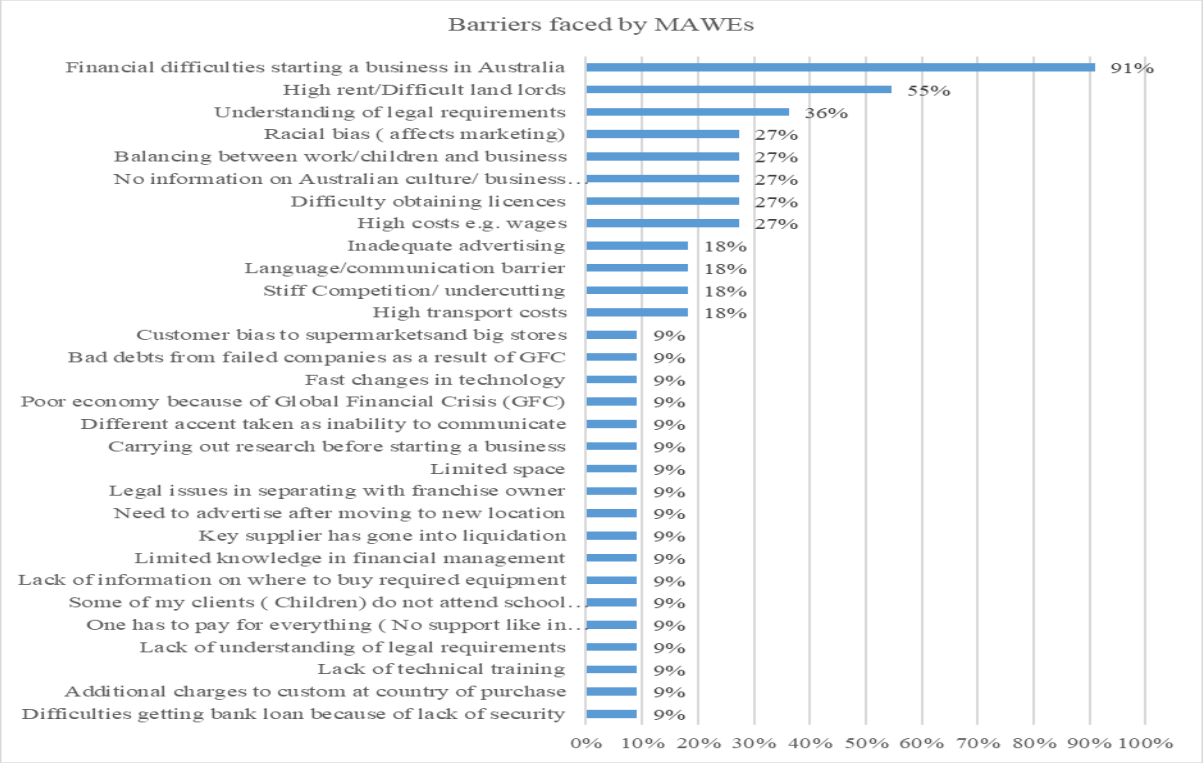


Diagram 3. Barriers and challenges experienced by women

Entrepreneurial cultural factors mentioned included the fact that some respondents experienced rejection or some form of racial discrimination and bias, as the following samples from interview transcripts show. Other factors were lack of information on Australian culture and business environment, inadequate support from fellow Africans, and different accents taken as the inability to communicate. Purity explained: *I realised that the culture here does not encourage entrepreneurship, especially on a small scale. Everything has been left to the big companies, big corporations, big shopping malls and the entrepreneurial spirit is just killed. People are happy to shop at big stores. The government is encouraging small businesses, and that is why it is giving tax breaks but if the customers are not buying from you the tax break is of no use, and there is no way you are going to survive. In my assessment, the entrepreneurial spirit is not nurtured by the locals.*
Ramonita said**:** *I have some customers in my business because of my colour, and they know that I am not an Australian, and they do not want to buy from me but they want my products…they will get someone else to come and buy it for them.* Reina said: *I have experienced racism…I tried to sell my dried fruits and snacks in Cairns, and I could not sell. The shop owners would taste and say okay, we will try next time, but I engaged a white person to help in the marketing, 80% of the shops in Cairns started stocking and selling my products, and from then on, they are making orders continuously*.

Collins and Low (2010) argue that the diversity of the paths to migrants' entrepreneurship is because some arrive in Australia as successful business migrants with sufficient start-up capital. Others migrants come with high professional and educational qualifications to enable them to fill labour shortages in the corporate sector. Others start from low-wage jobs. Finally, some migrants see entrepreneurship as an alternative to unemployment and

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others move to entrepreneurship in response to perceptions of racial discrimination (Collins & Low, 2010).Racial discrimination in the labour market blocks migrants mobility in the workforce, encouraging many of them to start up a small business (Collins et al., 1995).

Family entrepreneurial barriers and challenges mentioned included difficulties balancing between children and business. Ramonita said**:** *no family back up when children are ill or something. I remember when my child was sick I took a pillow and a blanket and I hid the child under a desk.* Callisto explains: *I experience many conflicts all the time. I try and plan, but when you have got children, you cannot prepare for everything. You cannot plan for sickness, tantrum day and all. My day at the shop seems to be busy after three o'clock, and at the same time my children needed to be taken home and cared for.*

Female entrepreneurs run an enterprise and a household at the same time. This may limit the time female entrepreneurs can devote to their businesses (OECD, 2013). Women usually engage with smaller networks consisting primarily of women. Household activities of women and other social obligations may lead to more isolation. The risk of isolation is particularly severe for women running home-based businesses (OECD, 2013).

Human capital barriers and challenges experienced included a lack of technical training and limited knowledge in financial management. Purity said: *To succeed in business, I…need education. Inadequate or inappropriate education and training is often a barrier*. Patina said**:** *Marketing the business with confidence is a barrier in Australia, So not being able to market the business to the public by yourself is in itself a handicap.*

Migrant entrepreneurs in Australia have been identified as having low levels of English language and literacy skills (Collins, 2008). This has acted as a barrier causing a variety of problems, such as a lack of awareness of training opportunities; a reluctance to participate in mainstream classroom-style training; difficulty in establishing networks; and difficulty in approaching financial institutions for loans (Collins, 2008). The learning of English has always been regarded as central to settlement in Australia and government policy has always closely associated language with settlement issues (Burnett, 1998).Some migrant entrepreneurs identified their low level of English language and literacy skills as barriers that caused a variety of problems (Collins, 2008).

Migrant entrepreneurs in Australia can have low levels of English language and literacy skills (Collins, 2008). Some women in this study identified their low level of English language and literacy skills as barriers that caused a variety of problems such as a lack of awareness of training opportunities and a reluctance to participate in mainstream classroom-style training. Other barriers are difficulty in establishing networks, in approaching financial institutions for loans, and the barriers of age, as Velvet explains: *my business has no technology use. During my old days, there were no computers. I want to use my own brain. I do not want this technology to tire my head. I am too old to learn it now. Too old to study technology now*

Social capital and network factors mentioned were that African women have a less favourable opportunity to become an entrepreneur compared to people born in Australia, and lack of functional networks. Purity exemplifies this; *I lack, and have not yet built social and professional networks, and need to succeed in the business world.* Reina said: *There are communication barriers, and maybe by nature a person might not be as outgoing. So somebody who has a lesser quality of a product, and can talk fast, have the marketing skills can quickly get into the market, while, somebody who is not as such will take a longer time to achieve the same objective to reach the same target*. An individual may have the ability to recognise that a given entrepreneurial opportunity exists, but might lack the social connections to transform the opportunity into a business start-up (Shane & Eckhardt, 2003).

Institutional factors that acted as barriers and challenges included: financial difficulties, inadequate support from Australian governments, high rent/difficult landlords, and lack of understanding of legal requirements. Other

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factors included difficulty in obtaining licences, high transport costs, inadequate advertising, and high costs of wages and weekend and public holiday's penalty rates**.** Reina said**:** *the inability to access business financial assistance from the government and the banks is a financial constraint. Banks will require you to provide collateral security, do the business feasibility study and write a business proposal*. Ramonita said: *I had a shop and the rent was very high. The sales were not meeting the budget to be able to pay the rent, and so I had to close the shop.*
Other studies show that the majority of migrants depend upon their personal savings as well as loans from relatives and friends (Sequira & Rasheed, 2006). Similarly, this study found that the women relied more heavily on internal than on external sources of start-up capital, raising smaller amounts of capital for financing their businesses. The women such as Emy, Velvet, Patina and Mandube started a business with their own savings. This reliance can deprive their enterprises of the capital needed to innovate, develop new products and services, hire critical employees, and grow (OECD, 2013).

Women are discriminated against in financial markets, being more likely to be denied loans, or to be asked for additional guarantees (OECD, 2013). However, lending discrimination is very hard to prove, and there is only scattered evidence that it is a common practice in OECD countries (OECD, 2013). Purity suspected that she had experienced discrimination, but it is not clear-cut. As she said: *when I opened my business I would have liked to get a loan, but I had things like school fees and mortgages to pay. The banks look at all that, and it is not easy to give a loan.*

One of the problems, of course, is that migrant women entrepreneurs from developing countries lack financial histories of borrowing and repaying loans (Mahmood, 2011). This was true for Reina who reported: *It is not easy for the banks to give you loans for the business, to get a loan from the bank you have to demonstrate that you can repay the loan…. For a migrant woman with no income at all and no past records or proof to show, it is very difficult to get a loan.*

Conclusions

This study has found that barriers and challenges experienced by the participating women in the establishment and operation of their businesses include cultural, family, human capital, social capital and networks, and institutional factors. The following are the five most important barriers to starting and operating a business by MAWEs in the Cairns region: financial difficulties, high rent/difficult landlords, lack of understanding of legal requirements, racial bias and difficulty in balancing time between business and family.

The experiences of women in this study agree with the findings of Azmat (2013), whose theoretical study found that the challenges of entrepreneurship involve cultural, family, social and human capital, and institutional factors. This study has the potential to become a foundation for further research in this area, serve to inform the aspiring migrant African women entrepreneurs and policymakers. This research offers an addition to literature regarding women entrepreneurs, focussing on personal migrant experience that is not adequately researched. Future research can explore practical business, social and actual strategies for overcoming barriers and challenges identified in this study.

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QUANTITATIVE ANALYSIS OF THE COMPETITIVENESS OF BENELUX COUNTRIES

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Abstract. Economic competitiveness is not only a microeconomic problem for business management. It is also an important indicator of comparison among the economic development, advancement and sustainability of respective countries. The investigation of macroeconomic competitiveness of individual states is at the forefront of the discourse of both macroeconomic experts and politicians. In this study we focus on the economic competitiveness of the BENELUX countries, that is Belgium, the Netherlands and Luxemburg. The objective of the article is to identify the position of the BENELUX countries as an economic union with respect to global economy and the potential for the growth and sustainability of BENELUX economic competitiveness. The first part of the article addresses the theoretical principles of the given problematic, delineates competitiveness within its economic determinants and positions a discussion with specific focus on the BENELUX countries. The article also addresses the cooperation within the union of these states in terms of sustainability of competitiveness. The empirical part of the article analyses the competitiveness of the chosen states using standard macroeconomic methods. Three indices were utilised in the analysis, the Global Competitiveness Index (GCI), the 'Doing Business' index created by the World Bank, and the Economic Freedom Index (EFI). We have also subjected the selected indicators to a correlational analysis, the aim of which was to identify possible correlations between the chosen competitiveness index and a chosen parameter. The results of the analysis reveal the current economic position of the BENELUX countries, and outline the economic opportunities and threats to further development.

Keywords: economic competitiveness; national economy; economic union; BENELUX countries; economic competitiveness index

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1. Introduction

There are several factors impacting the current economic status of individual countries, as well as the future development of the world economy as a whole: increasing globalisation of the world economy, international economic interdependence, the rapid advancement of communication technologies, trade liberalisation and shared economies. The economic competition of today aims to obtain a competitive advantage over other members of the world economy in order to maximise the gains for domestic economies. In today's world influenced by significant worldly phenomena the position of smaller states is markedly different to that of large, economically stronger states. Many states therefore choose to integrate themselves into unions and other forms of cooperation to lobby more effectively for their economic interests, products and services against bigger players on the global economic platform, thus achieving a positive economic balance.

The significance of investigating economic competitiveness of national economies is increasingly relevant in the era of integrated economies. Larger economic entities consist of smaller actors, which at any given time have a duty to evaluate the need and the purpose for remaining in the given integrated economy union. It is equally important for the economic union to assess the effectivity, productivity and competitiveness of its respective members so that the union benefits all parties involved. The comparison of the competitiveness of national economies with respect to other global economies has its individual meaning because such an analysis can reveal all kinds of positive and negative influences, opportunities and threats to the building of a competitively sustainable economic union. It is therefore clear that the quantitative analysis of economic phenomena is an important base line for macroeconomists as well as the representatives of central banks or high-ranking politicians, as the outcomes of these analyses are needed for the strategic direction of national economies.

It is important to note that economic competitiveness is one of the most frequented terms in expert circles and one of the most frequently discussed problems. It is therefore interesting that there is no one complex and specific definition that could cover all the determinants of the problematic. The term economic competitiveness is sometimes used to label the economic advantage of one economy over another (from a macroeconomic perspective) or a business subject (from a microeconomic perspective) in the global economic competitive environment. Competitiveness needs to be approached from a micro and a macroeconomic perspective. Several experts have expressed opinions on this problematic; it is generally not a simple task to define competitiveness as a phenomenon. This is because the central premise of the phenomenon is the ability of an individual economy to retain its unique position in the global market when faced with the unique capabilities of all other economies to do the same. Several scholars have tried to define the term (Casier, 2011; Matoskova & Galik, 2012; Tijanic & Obadic, 2015; Zámečník, & Rajnoha 2015; Simo et al., 2016; Brecka & Koraus, 2016; Rajnoha & Lesnikova, 2016; Melas, et al., 2017; Terzic, 2017; Tvaronavičienė, 2017; Domezet et al., 2018, Tvaronavičienė, 2018) taking into account the potential for competitiveness. The European Commission for example approaches the definition of competitiveness as the ability of a respective economy to establish itself on a platform of international economies and its components (economic, scientific, technical, social, demographic, political, legal and ecological) which present themselves as advantageous to the given entrepreneurial subjects in the given territory of its activity. Three levels of economic competitiveness are distinguished: macroeconomic, microeconomic and regional (known as NUTS III level). The Organisation for Economic Cooperation and Development (2017) also speaks about two levels of competitiveness in its definition, albeit not micro and macroeconomic, but academic and business levels. According to the academic level, economic competitiveness can be understood as a field of knowledge that analyses reality and forms policy that determines the capabilities of the state to create and sustain an environment conducive to upholding business values and public prosperity.

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The business level understands economic competitiveness as a way of creating, developing and sustaining an environment of competitiveness from the perspective of the state.

In this paper we focus on the macroeconomic level in terms of both the real-time problematic of competitiveness, as well as the regional understanding of competitiveness as an expert economic term.

2. Literature review

Ensuring economic competitiveness of countries, regions and private economic subjects lies at the centre of interest for economists and politicians alike. Every economic entity, the European Union included, aims to set such conditions that would support an all-round development and growth of competitiveness. From a long-term perspective, Funta (2012) considers setting up a proper legal framework for this indispensable, in order for the prosperity of all concerned. Svec and Madlenak (2017) add that the continued breaking down of market barriers enables implementing reforms and innovative business concepts, which strengthens competitiveness of individual subjects, as well as economy as a whole. Spirkova et al. (2017) see the role of individual EU countries in the implementation of such policies that would allow for free competition of business subjects to offer quality goods and services on the market. Cihelkova (2012) believes that the new European Union Member States are faced with the tough task of supporting economic growth and competitiveness of the entire union by its active participation, increase in GDP, added value, advanced technologies etc. The author outlines the increasingly higher demands put on the new member states not only from the perpective of fulfilling macroeconomic targets but also the sustainability of such positive development for the future. This presents potential risks of integrating new regions into the economic union. In order to reduce this risk it will become necessary to monitor with much more rigour the fulfilment of the convergence criteria in the transitional period of these potential new members of the union, in order to support the economic capacity and competitiveness of the union as a whole. The weaker regions will therefore have to show greater effort to level their regional disparity levels within the global competitiveness market.

Parausic et al. (2014) remind that the aspects outlined by Cihelkova and others will be instrumental in determining the future development of both national and global competitiveness. That is why Cekmeova (2016) recommends for competitiveness to belong amongamong a holistic approach to economic policy and for a separate branch of focus to be created to outline proactive and negative determinants that influence competitiveness. Gavurova et al (2017) concurs with this view, stating that the maintaining of competitiveness of individual countries will prove effective in building long-term economic development of all European regions.

Kiselakova et al. (2018) investigated the individual competitiveness capability of EU regions and looked into these regional disparities, stemming from individual macroeconomic efficiencies. Their calculations utilise the GCI index, applied to sub-regions. Kolosta and Kral (2015) emphasise the importance of such research by correlating competitiveness, macroeconomic balance and well-applied regional policy. According to them, the European Union has all the prerequisites (legislative, material, technological etc.) necessary to reach its set competitiveness and development sustainability targets. Tvaronaviciene and Razminiene (2017) concur and see the future of increasing regional competitiveness in the creation of new cluster initiatives, capable of absorbing the needs of the region, of accumulating resources, capital and technologies for the region, which in turn results in synergy and increased competitiveness of the given region. Fojtikova and Stanickova (2017) have broadened this analysis by the investigation of international trade operations that impact and significantly support the future competitiveness of respective countries. Grancay et al (2015) claim that competitiveness of individual countries

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depends on trade determinants and their alteration; in view of this they tested the applicability of the gravitational mode. Territorial investigation on the Visegrad four was carried out by Boda (2015) et al, later addressed by Cibik (2018) from a financial perspective.

Koraus et al (2017) bring another solution to the competitiveness conundrum, primarily to be addressed by stimulating economic growth through macroeconomic regulation of financial operations. Influencing the flow of national economies is first and foremost the role of central banks, more specifically in the case of the European Union we are speaking of the European Central Bank. In another article Dobovic et al (2016) expand this argument by another dimension, looking at specific strategies with a direct positive impact on long-term sustainability in economy and competitiveness. Fomina et al (2018) share the view that the only path towards a sustainable competitiveness capacity is through the mutual cooperation of small subjects and the state. Their research suggests that this is especially important in the field of industry as the greatest driver of national economies.

Balaz and Hamara (2012) carried out a research study focusing on the evaluation of competitiveness by reporting on its status during the financial crisis. It is precisely at this point of the economic cycle that emphasis has to be on such regulation of the economy that is capable of not only being sustainable but also regular increase of competitiveness. Similarly to them, Dobes et al (2017) investigated competitiveness from another point of view- the perception of other market participants. Their results show a clear correlation between the systematic and effective regulation of competitiveness-supporting processes by the state and other market participants. Without governmental support, measures supporting the increase of competitiveness cannot be taken.

Dulova Spisakova et al (2017) believe that competitiveness of individual countries is directly dependent on the investments into science and research as these are reflected in the resulting technologies enabling the production and services with higher added value. Their marketing and sales produce higher profit for both smaller subjects of the economy as much as the country as a whole. Hitka et al (2018) claim that the most important capital from a competitiveness perspective is social capital generated by the populace. Hafeez et al (2002) introduce the term sustainable competitiveness in their work and they see this phenomenon particularly in the key competencies of individual subjects, present in generating all competitive capabilities. Gavurova et al (2017) expands on this theory by claiming that there exists a relationship between trust and competitiveness building processes, as well as sustainable economic development and its growth.

In the following part of the article we focus on the selected countries, interesting for our purposes of evaluating competitiveness. These countries are Belgium, the Netherlands and Luxemburg, grouped in the union BENELUX. Kishluin (2012) claims that the policy making processes of this group are different to those of the rest of the EU. Their policies are markedly

pro-export in nature and their economies are primarily focused on producing export commodities, in which these countries manage to achieve either absolute or relative competitive advantage and are therefore continuously capable of positioning their production in the global market. Drynochkin and Sergeev (2016) point out similar differences. The authors have discovered that the Visegrad countries aim their cooperation primarily at mutual support, solidarity and help, whereas the BENELUX countries are more focused on their collective competitiveness targets in the global market. For a more in-depth analysis it is necessary to examine the development of the gross domestic product, as carried out by Cozanet (2014). In his research he compared the gross domestic product of the BENELUX union to that of Denmark; his results indicated that the BENELUX union is strongly pro-export with an open, liberal kind of economy with the main assets of the economy is the export of rapidly perishable products, albeit not food, such as flowers. Denmark, on the other hand, builds its

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economy and competitiveness primarily on food exports. Denmark is the smallest scandinavian economy and it is significantly dependent on international trade. Prasteyo (2016) among other has tried to answer the question of the true accelerator of competitiveness, but there is no simple soluion as competitiveness is impacted by several indicators. Due to the small body of research done to date on the economies of the BENELUX countries, this article aims to fill this literature gap by addressing a selected body of macroeconomic problems in need of immediate attention.

3. Methodology

Appropriate choice of methodology is an inseparable part of research. Macroecnomic analyses mostly utilise quantitative data analysis, complemented by select qualitative methods. That is also the case with our study. The selection of appropriate methodology begins with defining the objective of the study.

The primary objective of this study is identifying the current level of economic competitiveness of the BENELUX countries in a global market. Furthermore, we also identify a sub-objective of the research article- addressing the possibilities of strengthening the economic competitiveness of these countries. Another sub-objective is to examine closely the economic aspects of the countries which strengthen and also decrease their economic competitiveness.

Structurally, the article is divided into theoretical and empirical sections. In the first section we delineate the most significant determinants of the BENELUX economic competitiveness. We also examine the cooperative value of the respective states in terms of sustainable economic competitiveness. The empirical section of the article offers an analytical evaluation of the joint economic competititveness of the BENELUX union, based on standard macroeconomic methodology.

Having established the main objective and the sub-objectives of the article, we can address the selected methodology. From a broader perspective we have selected three indices of competitiveness- the Global Competitiveness Index (GCI) , the World Bank's Index Doing Business, and the Economic Freedom Index (EFI). These indices were selected for their ability to evaluate accurately the basis of the problematic they were designed for, as well as their upstanding reputation among macroeconomic experts.

The examined countries of the BENELUX consist of Belgium, the Netherlands and Luxemburg. Research to date in this sphere has only addressed the European Union as a whole, or smaller subunits such as the Visegrad Group. Research into macroeconomic efficiency or competitiveness is sparse on the whole. These reasons lead us to the examination of the given problematic in this particular region of the EU, especially interesting for its potential for sustainable competitiveness. The object of the research is the macroeconomic indicator of competitiveness, which represents the potential for economic competition. We look at the respective countries individually and also as a unit.

The results of the analysis reveal the current economic position of the BENELUX countries, and outline the economic opportunities and threats to further development.

When evaluating global competitiveness we use GCI index, defined as the following: the index contains over 100 variables and over 60% of these variables stems from soft data and under 40% stems from hard data. This index indicates to what level of complexity the national competitiveness of a given country can be evaluated

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holistically. The index contains a mathematically balanced average of the number of variables, whereby each variable is an individual reflection of competitiveness. The purpose of the index is to discover a realistically achievable economic growth in the long term.

Doing Business presents an index capable of illustrating the competitiveness of national economies, created by the World Bank. The World Bank belongs in the group of the most widely spread annual reports on competitiveness, as it publishes the list of 187 countries annually. The index is based on the empirical data examining the optimal status of macroeconomic regulatory measures, aimed at the development of entrepreneurship. The Doing Business Index integrates ten sub-indices, each representative of one sphere of business and entrepreneurship. The results of the index's mathematical calculations are values, whereby the greater the value the easier and more transparent the economic environment.

The Economic Freedom Index focuses on the evaluation of economic freedom. The index is applied worldwide in 178 countries. The purpose of the index is to uncover the determinants of economic freedom, financial freedom, the protection and the access to ownership rights. The results of the index's mathematical calculations are placed within an interval of 0 to 100. The greater the value, the greater the economic freedom in the respective economy.

Aside from the application of the above-mentioned indices, we expanded the quantitative analysis based on defining the main pillars of competitiveness. We have also subjected the selected indicators to a correlational analysis, the aim of which was to identify possible correlations between the chosen competitiveness index and a chosen parameter. We utilised Pearson's r correlational coefficient to ascertain the level of intensity of the linear correlation. With the adjusted r value we obtain the determining coefficient which determines the level of dispersion within the correlation, i.e. by what percentage the alteration of one variable alters the other. We therefore identify the strength of the relationship between the variables. Pearson's r is expressed as:

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

4. Results and discussion

In the empirical part of the article we focus on evaluating the position of the BENELUX countries through the lens of the main macroeconomic indicator, economic competitiveness. In our analysis we used the following indices: the GCI, the Doing Business index and the EFI. It is important to note that the BENELUX countries

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founded a customs union in 1948. In 1960 the customs union was replaced by a higher level of integration, an economic union, which enabled its members to freely move capital, goods, services and workforce.

At present Belgium, the Netherlands and Luxemburg enjoy a significant economic position not only within their region, but the European Union as a whole. They belong in a group of developed countries with advanced technology, impressive innovative capacity, quality education and other factors which together form a firm basis for building the competitiveness of the respective union members as well as the group as a whole.
Within our analysis we focused on evaluating the position of the respective three states in comparison with other European and North American states. The calculations were carried out using the GCI. As the full dataset for the year 2017 was unavailable at the time of publishing the article we carried out the analysis using the 2016 data. Figure 1 illustrates the situation described.

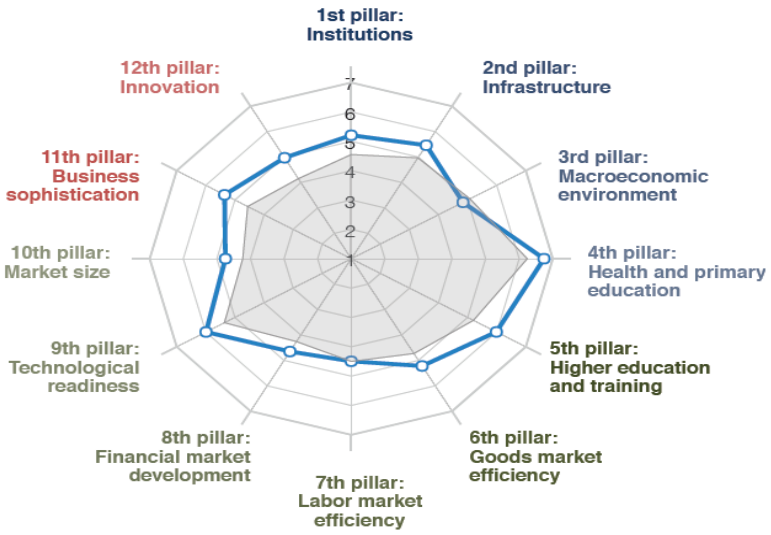


Fig.1. Competitiveness of Belgium in comparison with other European and North American states, according to the GCI in 2016.
Source: Schwab 2016 In: Mazák 2018

The graph clearly shows that in the case of Belgium the following competitiveness determinants are the most significant: primary schooling and healthcare, technological preparedness, business sophistication, infrastructure, and goods market efficiency. Good healthcare and an educated populace, a well-constructed infrastructure and technologies, as well as an agreeable business environment are the drivers behind the high competitiveness of the country (Figure 2).

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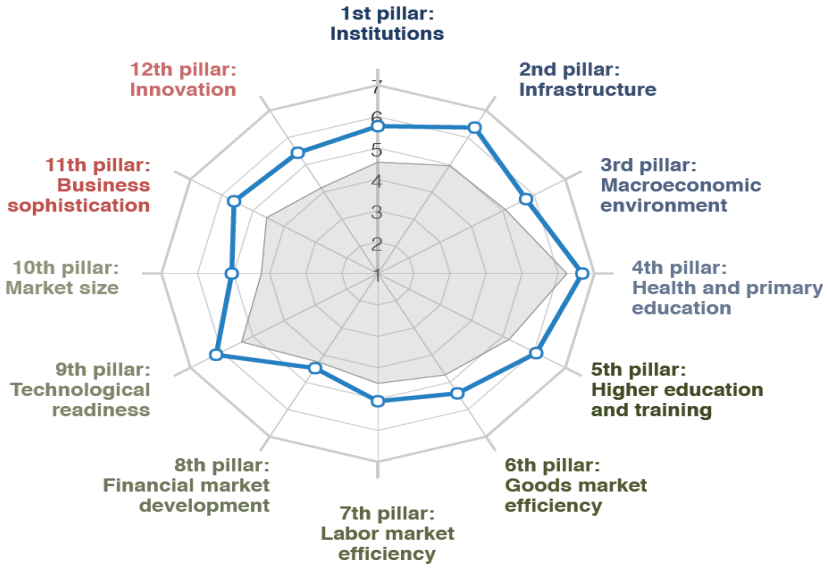


Fig.2. Competitiveness of the Netherlands in comparison with other European and North American states, according to the GCI in 2016.
Source: Schwab 2016 In: Mazák 2018

Figure 2 illustrates the results of the same analysis of competitiveness for the case of the Netherlands. There are no significant deviations from the results obtained by analysis of Belgium's competitiveness, as the main determinants of competitiveness are, similarly, education, infrastructure, technology and institutions. The interesting observation is that, similarly to Belgium, the financial market is not at the forefront of competitiveness factors. It would appear that other factors of the local economies are much more important in driving competitiveness.

Figure 3 follows the competitiveness analysis of the third state in the union, Luxemburg. The calculations were again carried out using the GCI. In this case there are definite differences in comparison with the other two states of the union. The most significant competitiveness determinants in the case of Luxemburg appear to be the following: technological readiness, macroeconomic environment, primary education and healthcare, institutions and goods market efficiency. The least significant determinant proved to be the size of the market. This factor is the least significant within the group as a whole (Figure 3).

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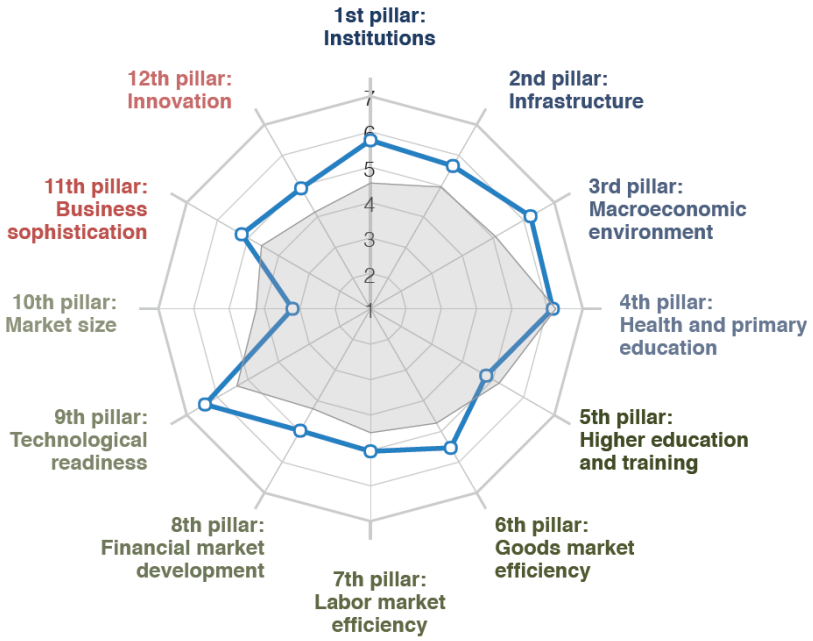


Fig.3. Competitiveness of Luxemburg in comparison with other European and North American states, according to the GCI in 2016
Source: Schwab 2016 In: Mazák 2018

The analysed states of Belgium, the Netherlands and Luxemburg are among the most competitive countries in the world, as confirmed by all three utilised indices. The complete ranking of the BENELUX states according to the individual indices is shown in tables 1 to 3. The examined time frame ranges from 2015 to 2017.

Table 1. Competitiveness of the BENELUX countries in 2015

State	Position of state in index		
	GCI	Doing Business	EFI
Belgium	18	38	35
The Netherlands	10	27	15
Luxemburg	7	57	16

Source: Author's own

Table 1 indicates the competitiveness rankings for the BENELUX countries for the year 2015. The rankings were calculated using all three indices as described in the methodology section of the paper (GCI, Doing Business index and EFI). The results show the highest ranking positions for the countries achieved with the GCI and the lowest positions in the rankings were attributed to the scores on the Doing Business index. The differences in calculations can be explained by the composition of the respective index, as each index has a different construct and takes into consideration different factors. The results of the GCI and EFI are the ones most resembling one another. The rankings show the position of the concrete state among other ranked states.

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Table 2. Competitiveness of the BENELUX countries in 2016

State	Position of state in index		
	GCI	**Doing Business**	**EFI**
Belgium	17	42	49
The Netherlands	4	28	15
Luxemburg	20	59	14

Source: Author's own, Mazák (2018)

Table 2 shows the positions of states in the ranking for the year 2016. It is important to consider the input of the respective index. For example the GCI ranking for Belgium (17th place) is three positions above Luxemburg's (20th place). The EFI however ranks Luxemburg (14th place) 35 places above Belgium (49th place). A similar phenomenon can be observed with the indices' results for the Netherlands and Luxemburg. The EFI is almost identical for both cases, however the GCI shows a 17 place difference in the ranking and the Doing Business index shows a 31 place difference. Differences also exist among respective states in the indices. The results can be explained both by the development tendencies of the given economy, as well as the varied composition of the different indices. We observe that the year 2016 as opposed to 2015 (except for Luxemburg in the first case) does not observe significant changes in ranking using the GCI and the Doing Business index. As for the EFI, there is a clear difference recorded in the case of Belgium, and for the remaining countries the results oscillate around similar values (Table 3).

Table 3. Competitiveness of the BENELUX countries in 2017

State	Position of state in index		
	GCI	**Doing Business**	**EFI**
Belgium	17	52	49
The Netherlands	4	32	15
Luxemburg	20	63	14

Source: Author's own

It is interesting that with regards to the EFI competitiveness ranking, the results were identical for all three countries in the year 2016 and 2017. This is the case for the GCI as well. The only reported differences were shown in the Doing Business index rankings. This would indicate that in the given timeframe the countries did not record any significant macroeconomic changes which would consequently reflect themselves in the country's competitiveness ranking scores.

For deeper analysis we also carried out an advanced analysis using correlational analysis, using Pearson's r value. Based on this structural analysis we created a correlational matrix that illustrates the relationship between respective index values. We did this in order to comparatively assess the results. The findings are presented in Table 4.

Table 4. The correlational matrix, quantified by Pearson's r value

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Pearson's r	Index		
	GCI	**Doing Business**	**EFI**
GCI	1.00	0.79	0.85
Doing Business	0.79	1.00	0.88
EFI	0.85	0.88	1.00

Source: Author's own

We investigated the presence of correlational dependence between the rankings constructed using renowned indices (GCI, Doing Business, EFI). The cross comparison was carried out using results from previous similar analyses. In a detailed examination of the results we observe that there are statistically significant correlations between respective indices; based on the high values recorded we conclude a statistically significant correlation. The 'p' value of Pearson's r places itself on the spectrum of 0.79 to 0.88, at which point we speak of a near perfect correlation. This shows that the competitiveness ranking using renowned indices is an empirically suitable way of analysis and using one of the most significant indices shows similar results when compared with another index used - this is particularly true when comparing the GCI and the EFI. In practice this indicates that competitiveness ranking can be carried out with an equal amount of quality, expertise and similar method of specificity in one index as much as the other two.

Conclusions

A purposeful building of competitiveness should definitely be at the heart of macro and microeconomic decisions, as well as the agenda of national economies. In terms of macroeconomic approaches to the problematic of competitiveness the state is the key actor in creating the conditions for healthy competitive environments. The state plays a key role in creating the legislative environment conducive to the free movement of capital, goods, services, human capital, financial capital and in removing the barriers and creating equal opportunities and conditions for the members of the market and the non-commercial sectors alike. Economic subjects therefore have an open space for economic competition where each participant must conduct themselves in order to do better than the rest. Such an environment is preconditioned by a unified concept and policy- making strategies on a long-term basis of taking appropriate measures in harmony with the opinions of experts.

The competitiveness of individual economies is directly derived from the level of competitiveness on a microeconomic, that is, business level. Aside from the competitiveness of businesses, the competitiveness of other subjects of the national economies is also a contributing factor to the general construction of the country's economic competitiveness. These are for example, economic guilds and organisations of commercial and non-commercial nature, or also governmental businesses, the banking sector or the financial sector. All of these either contribute to the driving or the obstruction of the country's economic competitiveness. It is incredibly important to pay special attention to the competitiveness factors as a collective, rather than in isolation, be it local, regional, national or global markets. Sustainable development can only be achieved by a well-thought-out economic strategy, by free movement of manufactured products and by effective use of governmental tools in favour of a rational regulatory economic policy.

In this paper we focused on the examination of competitiveness of national economies grouped into the BENELUX economic union. We focused on a quantitative evaluation of the competitiveness of Belgium, the

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Netherlands and Luxemburg with the goal of identifying their current position of competitiveness in the global market. The gathered fact-based material utilised for the analysis was complemented by secondary data and scholarly research into the subject. On a theoretical level it was clear to us that there is no comprehensive body of literature and research on the economic union of the three countries and the research into their competitiveness is sporadic at best. Filling this literature gap is, among other objectives, where the paper's true value can be found; furthering research into competitiveness evaluation of the EU. On a practical level we obtained the following conclusions:

* The BENELUX countries benefit from their competitiveness due to their combined economies, innovative capacity, industrial maturity, technological readiness and a quality educational system.

* The commodities structure of the analysed countries heavily relies on the production of non-food commodities.

* The quantitative results of the analysis, utilising competitiveness indices lead to the same results when applied individually with minimal deviation, considering specific composition criteria of the indices.

* The BENELUX countries regularly place among the top positions of competitiveness, which is indicative of their systematic efforts at bettering their own competitive capabilities based on a well-thought-out economic strategy, education and institutional background.

* The executive body for competitiveness and innovation VASHI has its headquarters in Belgium, directly in Brussels.

* From the perspective of effectivity, measured by the index of innovation effectivity, Luxemburg and the Netherlands occupy two of the top three places in the ranking.

Our results contain important information about the current position of the BENELUX countries and their competitiveness. They can be utilised as a basis for further research; as foundation for the assessment of macroeconomic theory of regional character within the EU; as foundation for political and economic policy-making processes in these or similar countries. The future economic growth and development sustainability for European regions will undoubtedly depend on the ability of policy makers to listen to the recommendations of experts in this field.

Michal Mazak is an expert in economy and a practicing lawyer, as well as a doctoral candidate of the Economics and Business Faculty of the Pan-European University in Bratislava. His background and research interests include the fields of economic competitiveness, economic efficiency, effectivity and legislative framework for economic growth of small businesses, regions and countries. He has authored several scholarly works, scientific research papers and has contributed to several international economic for a. His dotctoral thesis deals preciselz with the competitiveness capacitz of the BENELUX states.

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