ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

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CONTENTS

HOME OFFICE EFFECTS ON THE MOTIVATION OF ICT COMPANIES' EMPLOYEES*

Kiril Anguelov [1], Miglena Angelova [2]

[1] *Technical university of Sofia, French Faculty of Electrical Engineering, Kliment Ohridsky blv St 8, Sofia, Bulgaria*
[2] *University of National and World Economy, Faculty of Management and Administration, Studentski grad, Sofia, Bulgaria*

E-mails:[1] ang@tu-sofia.bg ; [2] m.angelova@unwe.bg

Abstract. Restricted measures for social isolation taken as precautions in the fight against pandemic due to the COVID-19 virus, have changed dramatically the normal business and professional life. Companies in all sectors have to be adaptive and flexible in order to survive in this complex and hardly unpredictable business environment. At first glance ICT sector is not so severely and visibly affected by the COVID-19 economic crisis. Due to numerous reasons companies from the sector have so far shown an enviable level of flexibility and adaptability to the rapid changes in business environment conditions. As a response to the anti-epidemiological requirements, most often used tool from ICT companies is to transform working processes from office to home, following the line of social isolation. In this regard the major objective of the current article is to reveal the specifics of home office work in ICT companies and its impact on the employees' motivation in terms of their perceptions and level of commitment to the achievement of companies` goals. For this purpose we used questionnaire survey among employees working in different job positions in ICT companies in Bulgaria (n=158). Our findings reveal that majority of employees (almost 80% of responders) have positive attitude to the home office as a working measure in social isolation conditions. On the other hand, home office does not significantly impact on the level of employees` motivation and their engagement to the achievement of the company's goals. Based on analysis of collected data, we propose divers measures for improving the employees satisfaction and motivation in specific context of home office work during stress crisis situation, such the pandemic is.

Keywords: IT companies; IT management Home office; employees' motivation

1. Introduction

Professional and personal life have been totally affected last few months by the different measures taken as precaution in order to reduce and slow the spread of infection of COVID-19 virus on a global scale. Companies in all economic sectors strive to survive in changing environment, where traditional economic logic and principles are dominated by the rules dedicated to protect human health. Social isolation directive imposes new agenda in working process of companies where only the most innovate, adaptive and flexible could be considered as some sort of successful in this difficult for all players situation.

At a first glance, companies in ICT sector are not so severe affected by the coronavirus crisis especially in comparison with other sectors such as tourism, transport, construction etc. Thanks to the technical progress from one side and the specifics of the business itself from the other, companies from ICT sector show good level of adaptability working in new and rapid change sever conditions. In this specific environment where the economic logic gives way to the fight for human health and life, the most used by ICT companies measure is to convert working process from traditional business office to home office. This transformation allows at the same time keeping the normal functioning of the working process (executed in real time but at distance) and on the other – to observe the anti-pandemic measures for social isolation.
I
n this regard the logical question that arises is how work in home could affect the level of satisfaction, motivation and overall commitment of employee to the achievement of the company's goal. Is there a connection between physical place of work and level of sharing common organizational values? Could home office influence on the level of creativity and quality of teamwork? Is it possible only with technological support to overcome the limitation of being isolated and on a totally different place from colleagues?

Following this same line of exploration, the main objective of the current survey is to reveal the specifics of home office work in ICT companies in Bulgaria and its impact on the employees' motivation in terms of their perceptions and level of commitment to the achievement of companies` goals. For this purpose we used questionnaire survey among employees working in different job positions in ICT companies operating in Bulgaria (n=158). Our findings reveal that that majority of employees (almost 80% of responders) have positive attitude to the home office as a working measure in social isolation conditions. On the other hand, home office does not significantly impact on the level of employees` motivation and their engagement to the achievement of the company's goals. Based on analysis of collected data, we propose divers measures for improving the employees satisfaction and motivation in specific context of home office work during stress crisis situation, such the pandemic is.
Here we have to point out that according to our own observation, the major part of ICT sector,
In order to be precise we have to consider also the complexity of today's situation – we do not have such precedent in a recent history – to be in a pandemic with all the ensuing consequences. Therefore all collected data of the current survey and obtained results on the attitudes and perception of employees in Bulgarian IT companies have to be analyzed in special attention with the specific context of pandemic. The major contribution of study is namely to explore and analyze the attitudes and perceptions of employees in IT companies in Bulgaria to home office in terms of their motivation and commitment to the company's goal in the specific context of pandemic.

2. Literature Review

Companies in ICT sector are object of many researches exploring different aspects of their business activities and methods for innovations and development during last few decades. This tendency is easily explicable due to the fact that ICT is among the fastest developing sectors of economy, based on the technical progress and achievements in innovations. Therefore the scientific interest covering divers dimensions of this development is logical and understandable.

For instance we have researches dedicated to pure managerial topics on the ICT companies. Good example in this line is a study for project strategy alignment. Author explores 144 enterprises operating in this specific sector on national level and after a comprehensive analysis claims the following: ICT companies should focus on gaining alignment of project strategies with business strategies over the course of projects. An early identification of misalignments between project strategy and business strategy will be crucial in putting in place essential strategies and fallback plans for successful implementation. If ICT companies have little or no control over the alignment process of projects, they cannot ensure the success of the projects (Soltani, 2020). Another study is focused on the future outsourcing projects in ICT, presenting specially developed mathematical model. Scholars claim: …a quantified model was designed to evaluate the security level of ICT outsourcing. Moreover, a method to evaluate the security level of ICT outsourcing was developed to allow companies to evaluate their own security levels. Using the model and evaluation method to evaluate the security level of ICT outsourcing, companies are expected to evaluate the security level of each inspection item and use them as a security countermeasure method (Moon et al., 2018). Hidalgo and Herrera focus on the innovation management and more precisely in knowledge-intensive business services (KIBs) in ICT sector. They consider: The results obtained indicate that the generation of added value in ICT services requires the implementation of co-creation processes in which different actors are involved. In this context, customers, partners, and suppliers play an important role, while this is not the case with universities (Hidalgo, Herrera, 2020).

There are also a number of recent researches focusing on the the motivational potential of the factors that will make the workers more engaged in the work tasks in the high-tech enterprises. The analysis of the results gives to the team of authors the opportunity to highlight the factors with the greatest motivational potential for the - highly qualified specialists with higher engineering education. The first five most significant motivational factors are „Opportunity for development and self-realization ”, „Interesting and challenging tasks ”, „Opportunity for initiative and expression ”, „Ability to upgrade the qualification ” and „Labor remuneration ” (Mihova, Chukalov, Ferdov, 2019).

Other researches focus on the impact that ICT sector has on the overall economy development and its power to act as a driver. Vu, Hanafizadeh and Bohlin present a study on the scientific literature analysis on the role and importance of ICT namely as a driver to economic growth. They admit: Changes driven by the ICT revolution are expected to increase in the decades to come. Further, the growth effects of ICT are becoming an increasingly popular topic for published research (Vu, Hanafizadeh, Bohlin, 2020). Interesting study is presented by a Spanish scientific team, exploring the role of ICT sector on the economic growth based in the context of European union countries, which are also and the members states of the Organisation for Economic Co-operation and Development (OECD). Scholars claim: The main conclusion of our work is that ICT drives economic growth within the framework of developed European economies. At a more specific level, issues such as broadband connectivity and the use of the Internet are of particular importance, the latter valued not only by the number of users but also by the type of use (Fernandez-Portillo, Almodovar-Gonzalez, Hernandez-Mogollon, 2020). Edquist and Henrekson explore the importance and contribution of ICT and R&D in the context of the Swedish national economy. They study a nearly 20-year period examining the information for almost 50 different industries in order to define the real impact of ICT sector on the development of national economy. They come to

the following interesting finding: When ICT capital is divided into hardware and software, only software is significantly associated with value added. To our knowledge this distinction has not been made in any previous study at the industry level. One possible explanation could be that all industries invest in hardware, but only the ones that successfully invest in and implement software enjoy positive effects from ICT (Edquist, Henrekson; 2017). Interesting dependence is revealed by a study, exploring through the international cross-country analysis the interaction between ICT diffusion, financial development and economic growth. Scholars claim: ICT diffusion can improve economic growth in high-income countries, but the effect is ambiguous in middle & low-income countries. In middle & low-income countries, only mobile growth can raise economic growth, whereas increasing Internet and secure Internet sever cannot (Cheng, Chien, Lee, 2020). Čorejová and Madudová present the trends in growing influence of ICT sector. They conclude: The absence of ability to respond to global environment has changed to responding to the global environment and there has been formatting new sector structures with strengthening the scale-up effect of ICT. This scale-up effect pressures on competitiveness and sustainability in all sectors (Čorejová and Madudová, 2019).

There are also a number of recent researches focusing on the different aspects of ICT impact in other specters of economy and society development – for instance Tranos and Ioannides (2020) – in connection to cities and aglomeration development, Kiisler, Solakivi, Hilmola (2020) – supply chain in Estonia etc.

There are relatively few researches concerning the special focus of our current study, which is home office and its influence on the motivation of employees. In this line we have to point out the work of Hill, Ferris and Martinson, who present a comprehensive comparative analysis on the three different work of venues: traditional, virtual and home office and their influence on the employees. Scholars claim: In summary, the results of this study indicate that telework offers the potential for enabling employees to better balance work and family life while at the same time enhancing business performance. The present study finds little evidence that telework has any negative business ramifications at all (Hill, Ferris, Martinson, 2003). The balance between work and family is a subject of another broad scientific discussion; here we could mention the following conclusion, made by scholars: …balance does play a significant role in of the mediated relationships between support and satisfaction. However, these relationships are not fully mediated as predicted; rather, coworker support has a direct relationship with job satisfaction and partner support has a direct relationship with both job incumbent marital satisfaction and partner family satisfaction (Ferguson et al., 2012). The most of activities of employees in the micro ICT companies have a strong entrepreneurial orientation. Many studies show that the motives "take advantage of my creative needs" and "realizing my dreams" have a leading role in carrying out entrepreneurial activity (Dimitrov at al, 2019a) and how they are distributed between genders (Dimitrov, Dimitrova, 2019c). In addition to environmental factors, entrepreneurial activities are also influenced by behavioral factors. Research in the Bulgarian context shows that close relatives, friends and family have a very strong influence on the motivation for entrepreneurial activity (Dimitrov at al, 2019b). The internal locus of control describes the tendency of individuals to believe that they control the events in their lives instead of attributing them to external circumstances (Dimitrov, Dimitrova, 2019d). It is interesting to know how home office work has influenced the change in motivation factors and the motivation of companies' employees according their behavioural locus of control. Strategic management in the human resources field is the focus of Stoyanova, which explores in depth this specific (Stoyanova, 2019). The same author, together with a team of researchers explores characteristics of personnel development in the industrial companies (Stoyanova et al., 2019).

Soft skills of employees in the specific context of micro ICT companies are focus of the special research. Authors conclude: the most important soft skills to be developed in the ICT micro-companies in partner regions are: communication, problem solving, teamwork, learning mindset, creativity, leadership, strategic thinking, customer service, innovation, and risk management (Szilárd, Benedek, Ionel-Cioca, 2018).

Almost at the same line, concerning level of usage ICT and its impact on the employees is explored by another scientific study. Authors use term such as technostress and admit: Our findings indicate that both technostress creators and inhibitors influence employee use of ICT (Fuglseth, Sørebø, 2014).

Researching the work in the digital environment, Temelkova introduces the concept of digital leadership and defines it as a leading to higher added value for the organizational system, as well as to integrated comprehensive use of information and communication technologies, a toolset and human resources in a digital environment in view of achieving the strategic orientation targets of a certain business system through team interaction between people working with connected in a network computers and/or mobile devices, achieved on the basis of applying a particular leadership style in a virtual environment (Temelkova, 2018). According to her, work in a digital environment is based on ten principles: principle of technological innovation, leadership principle, team spirit principle, principle of learning along the entire working process cycle, quality principle, principle of resource provision, speed principle, stability principle, adaptability principle and efficiency principle (Temelkova, 2019).

In a more recent context related to the pandemic situation, there are already a number of researches focusing on the different use of ICT technologies and their reflection to the employees. Special study is dedicated to the technological spatial intrusion that could be transformed on the employee accessibility and their visibility (Chandra et al., 2020). Brooks presents the specifics in dress code expectation in case of working from home. Scholar claims: the spread of the coronavirus has meant that the workplace will be forever redefined under a "new normal," where one of those new realties is that most teams will continue to work remotely (Brooks, 2020).

3. Methodology of the study

3.1. Study Area

Employees in ICT companies and their perceptions are in the focus of the study, attitudes and assessment on the effects of home office. The idea of the study is dictated as a result from one side by the pandemic situation of COVID-19 and measures taken as precautions in fight against the spread of disease. On the other hand, companies in ICT operate in high tech level sector and technological progress allows executing transition of business processes from office to home without any big inconveniences from all players – customers, employees, managers and ICT sector as a whole. Something more – our initial observation was that especially in Bulgaria in ICT companies there is no big change in the type of work during the period between the two big waves of COVID-19 (March-May 2020 and December 2020 with the starting of the Second wave and respective restrictive measures taken on the national level) in which the home office was the preferred method of work for the major part of the companies.

Based on all mentioned above our hypothesis are as follows:

Hypothesis 1: Majority of employees in ICT companies have positive attitude towards home office as a working measure in a pandemic situation.

Hypothesis 2: Home office does not significantly impact on the level of employees` motivation and their engagement to the achievement of the company's goals.

3.2. Data collection techniques

Data was collected trough a special questionnaire developed for the purposes of the current study. It includes 27 questions in total, based on the Google forms platform.

The questionnaire was divided into 3 general parts:

1. questions, collecting personal information of employees – gender; age; years of experience in ICT sector; years of specific experience in the current ICT company; job position/ role at the company.
2. questions, collecting information for organisation – type of the company; size of the company; property/ owners of the company
3. questions, collecting information on the self-assessment of employees on the different aspects of home office.

Specific questions for home office were two types – open (the responders were asked to create their own content) and closed (the responders were asked to choose among predefined alternative answers). In addition, we have two question based on the 7-points Likert scale for overall assessment of home office benefits – both on individual and organizational level. The questions are as follows:

- Do you have experience in home office type of work?
- What is your general opinion about the home office?
- In your opinion does home office increase your free time?
- Please explain how home office increases / decreases your free time
- In your opinion does home office increase your creativity?
- Please explain how home office increases / decreases your creativity
- In your opinion does home office increase your commitment to the company's goals?
- Please explain how home office increases / decreases the level of commitment of employees to the company's goals
- How does working in home office affect teamwork?
- What is (are) the reason(s) for the home office's influence on the teamwork?
- How does working in a home office affect the relationships between colleagues?
- Does your company encourage you to work at home?
- Do you feel motivated to work at home?
- How do you evaluate your personal benefits from home office (using 7-points scale)
- How do you evaluate the benefits from home office for the company (using 7-points scale)
- In your opinion what are the benefits for your company from home office?
- Which software platforms you use for coordination with colleagues working in home office?
- What would increase the efficiency of home office work (open type of question)?
- Your proposals in improving the home office work (open type of question)?

Questionnaire was sent to more than 110 companies ICT operating in Bulgaria and employees were asked to respond on a voluntary basis. As a result for the period of three months (September-November 2020) we received 158 responses. The presented below analysis is based namely to those responses.

4. Summarized survey results and comments

4.1. Personal status of responders.

According to data collected from survey, 63,8% of responders are males and 36,2% are females (fig. 1).
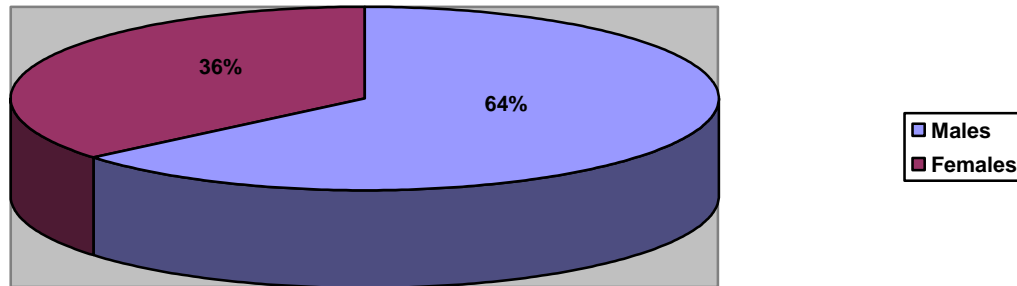
Fig. 1. Gender of responders

This profile of responders is logical having in mind the specifics of ICT business and the required technical education for different job positions in company in this sector.

In terms of age, the profile of responders is presented on fig. 2
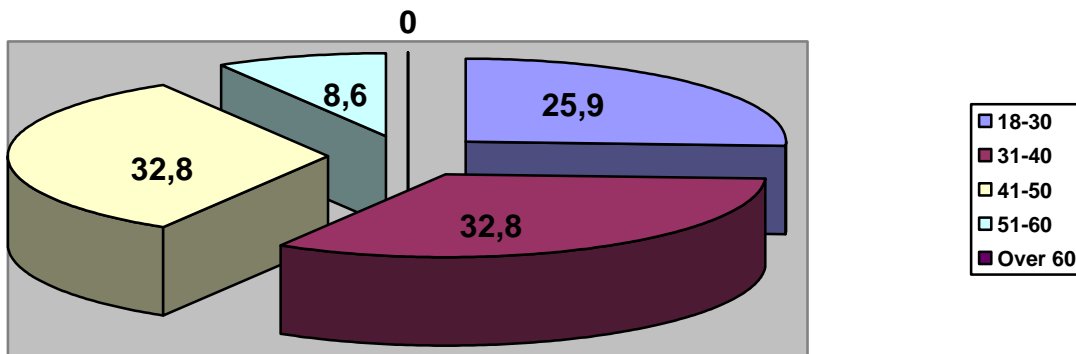
Fig. 2. Age of responders (in %)

As it can be seen from fig. 2, we have two groups of responders (aging 31-40 and 41-50) with the same share of representatives in our survey. On the other hand, the group of 18-30 years old has share of 25,9%, wile the group between 51-60 years old has 8,6%. We have not received answers from people over 60 years.

Experience of the responders in ICT sector is summarized and presented on fig. 3. The major group in terms of experience among our responders is the group from 1 to 5 years of experience in ICT sector with a share of 29,3%, followed by the group claiming over 15 years of experience – 27, 6%. Third place is for responders with 10-15 years of experience in ICT sector with 22,4% share.
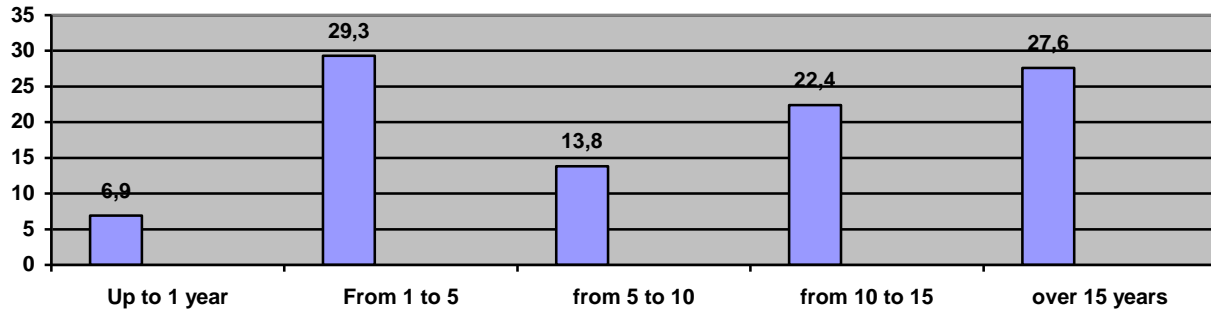
Fig. 3. Years of experience of responders in ICT sectors (in %)

On the other hand, it is also interesting to understand the specific experience of our responders in the current ICT company. The information will allow us to reveal in some degree the ability of company to attract and motivate the employees. Here the situation is totally different from the previous figure. The half of our responders (50%) declare from 1 to 5 years of experience in the current company. The second group is formed by employees with experience in the company up to one year (20,7%), followed by those with 5-10 years of experience. The share of the last two groups is almost equal – 5,1% of those with experience between 10-15 years and 5,2% - the employees over 15 years of experience at the same company (see fig. 4).
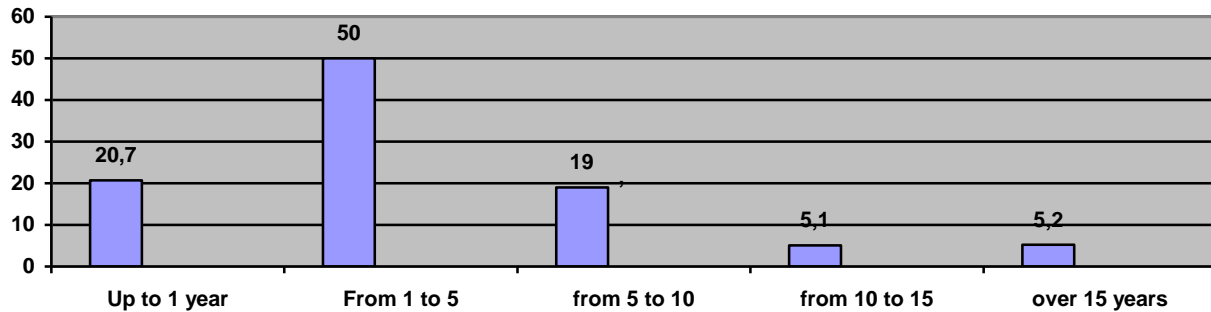
Fig. 4. Years of specific experience of responders in the current company (in %)

The next question is related to the major role (job position) of employee in the company. Results are presented on fig. 5.
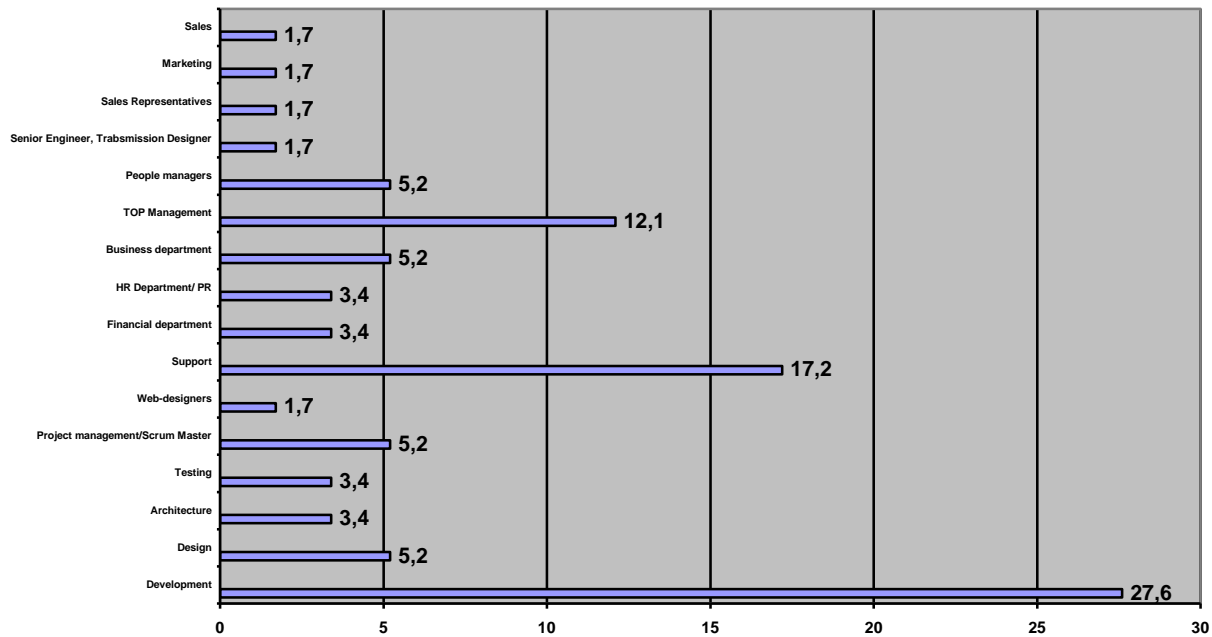
Fig. 5. Major role of responders in the ICT company (in %)

The major part of our responders forms the group of Development (27,6%), followed by Support (17,2%). On third place is the group formed by the Top managers (share of 12,1), followed by four groups with equal share of 5,2% - Design, Project Management/ Scrum Master; representatives of Business Department and People managers. Therefore the majority of our responders are people who are directly responsible for specific ICT activities in the companies and formed so called main core of the company in ICT business.

4.2. Company's profile

The type of the company in terms of offered services is presented on fig. 6. As it can be seen from the figure, the majority of our responders claim working of software companies (62,1%), followed by those in companies, offering more than one services to their clients (19%). Third group is for representatives of telecommunication companies (15,5%). The smallest group is of representatives of hardware companies.
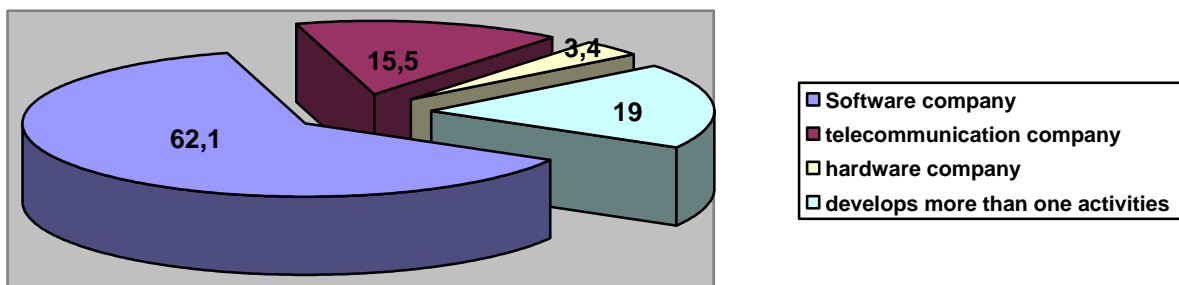
Fig. 6. Profile of ICT companies according to the offered services (in %)

In terms of size, the data is graphically presented on fig. 7. Major part of our responders claim working in big company (31%), which means more than 250 employees. Second group is formed by responders, working in middle-sized enterprises (29,3%) – with number of employees from 51 to 250, followed by the representatives of micro enterprises (with share of 25,9) – up to 10 employees of the company. The last group (13,8%) is from representatives of small enterprises (with number of employees from 11 to 50).
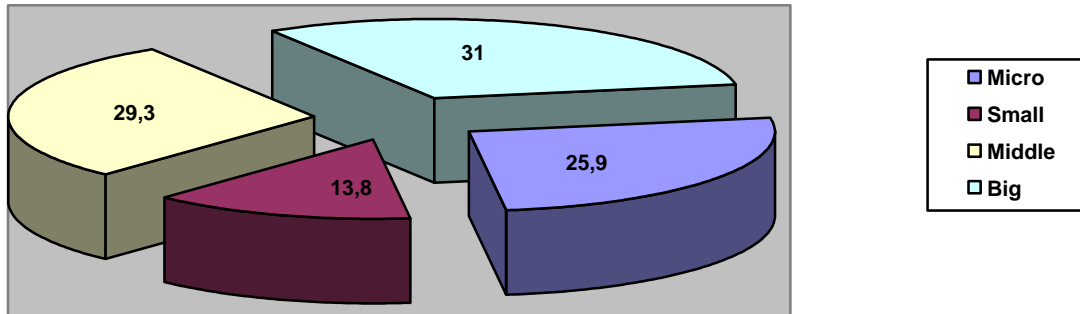
Fig. 7. Profile of ICT companies according to their size by the number of employees (in %)

The type of the companies in terms of properties is presented on the fig. 8. The majority of our responders (almost 40%) claims working in Bulgarian branch of a big international company (which have already enough experience in distance communication), followed by employees of Bulgarian companies (36,2%), third place is for the representatives of company with foreign owners (22,4%).
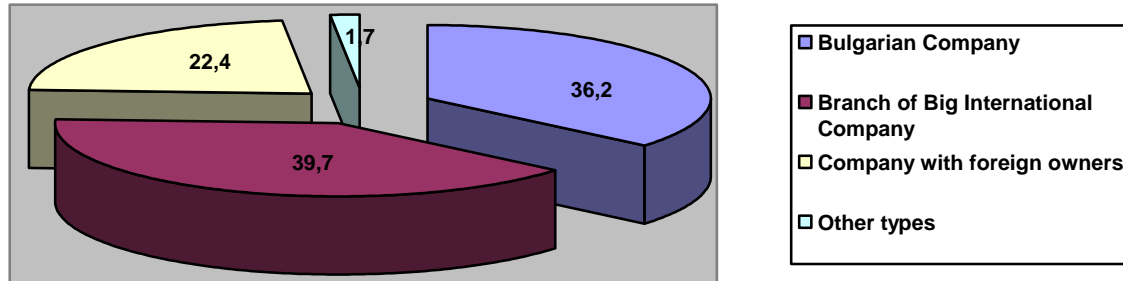
Fig. 8. Profile of ICT companies in terms of properties (in %)

4.3. Employees` self-assessment on the home office effects

We started collection of information on the specific personal experience in home office by the following question: Do you have experience in home office type of work? Responders were asked to choose between different predefined alternatives. The share of responses is presented on table 1. Almost 52% from our responders claim that fully work at home, followed by the employees (15,5%) who declare that approximately 80% of work implemented at home. On the totally opposite side are 13,8% of employees in ICT companies who admit that rarely work in a home office. Here the impressive result is 0% of people with no experience in home office. Therefore all responders are experienced and are capable to assess the effects of home office on their motivation and work.

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Table 1. Specific personal experience in home office

Alternative	Share of responses
Yes, I fully work at home office	51,7 %
Yes, I do approximately 80% of work at home. We meet at the office only to coordinate some super specific tasks and activities.	15,5 %
Yes, I do about half of the work at home	12,1 %
Sometimes I work at home, but most of the time I am at the office	6,9 %
I rarely work in a home office	13,8 %
No. I have no experience working in a home office	0 %

The next question collects information on the general opinion of responders to home office (fig. 9). The major part of responders (41,4%) claims that they have strongly positive opinion to home office, followed by the group of employees who declares also positive attitude in general to home office (37,9). Therefore we have a significant approval - almost 80% (79,3%) in total of employees who admit positive assessment versus 10,3% neutral or undecided yet employees and other 10,3% (in total) of responders who claim negative opinion.
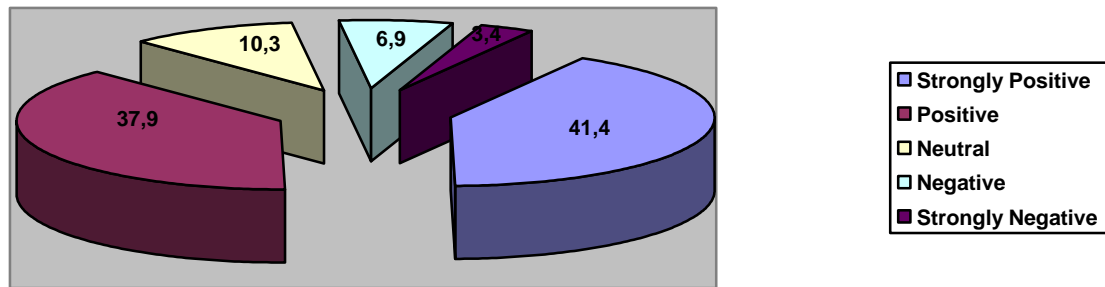
Fig. 9. General assessment of employees to home office (in %)

The relation between home office and free time of employees is the subject of the next question: In your opinion does home office increase your free time? Here the responders were asked to selected on of the following alternatives:

- yes, home office significantly increases my free time – chosen by 27,6% of responders;
- yes, my daily free time increased between 1-2 hours – chosen by 25,9% of responders;
- home office did not affect my free time – chosen by 31% of responders;
- no, my daily free time decreased between 1-2 hours – chosen by 5,2% of responders;
- no, my daily free time significantly decreased – I am constantly in some sort of working activities – chosen by 10,3% of responders.

In a summary to this question we have to point out that more than half of responders (53,5%) claim that home office increases their free time. Here we have also to consider the significant share of responders (31%) who admit that there is no change of their free time. On the other hand, there is 15,5% share of employees who admit that their free time decreases as a result of home office. This could be considered as an alarming result that has a potential to form in a future a negative trend to overall opinion of home office. On the table 2 there is a comprehensive information on the relation between home office and free time. Responders had a possibility of multiple choices.

Table 2. Interactions between home office and free time

N	Alternative responses to question Please explain how home office increases / decreases your free time	Share of responses
1.	Reduce travel time from home to office	87,9%
2.	Allows tasks to be completed in a more planed and organized manner, which gives me more free time	29,3%
3.	Being in home office I have to spent more time coordinating which leads to reducing my free time	17,2%
4.	Being in home office thanks to the software we use allows me improving my coordination	8,6%
5.	Being in home office I find myself more creative which allows me to save time	20,7%
6.	Being in home office I can organize my time when I am more creative to complete specific working tasks	44,8%
7.	Being in home office it happens to do several time specific tasks due to the poor coordination	10,3%
8.	Being in home office allows me to be more inspired and relaxed	19%
9.	Being in home office I feel difficulties to concentrate, which leads to wasting of time and to work more hours as compensation of my lower level of effectiveness	27,6%
10.	My job specification requests continuous communication with the team and being in home office takes me longer than in direct communication in traditional office	24,1%
11.	There is no direct contact between all team participants where some activities have to be done several times due to poor communication	37,9%
12.	I don't like permanent control, therefore in home office I am more efficient	20,7%
13.	None of the above	0%

Reducing travel time to work is recognized by the significant part of responders (almost 90%). Another preferred alternative is the possibility of more effective planning on an individual level (almost 45% from responders). As some of the weaknesses we could point out lack of direct contact and communication (almost 38%) and the lack of effective coordination (10,3%).

Next question is dedicated to the relation between home office and creativity and is the following: In your opinion does home office increase your creativity? Here the responders were asked to selected on of the following alternatives:

- Yes, definitely I am much more creative – chosen by 13,8% of responders
- Yes, I am more creative – chosen by 27,6% of responders
- I have no opinion – chosen by 3,4% of responders
- No, home office does not affect on my creativity – chosen by 48,3% of responders
- No, my creativity decreases – chosen by 5,2% f responders
- No, my creativity significantly decreases – chosen by 1,7% of responders

Here the majority of responders claim that home office does not affect their creativity (48,3%). On the other hand, employees who admit that home office impacts positively on the level of creativity form another 41%, which is significantly larger than the share of people with negative effects (almost 7% in total). The next question explains in details the relation in the line home office – creativity (table 3). Responders had a possibility of multiple choices.

Table 3. Interactions between home office and employee's creativity

N	Alternative responses to question Please explain how home office increases / decreases your creativity	Share of responses
1.	The atmosphere at home predisposes me to work more effectively	39,7%
2.	The atmosphere at home distracts me	22,4%
3.	I don't like formal permanent control, which doesn't exist in home office	27,6%
4.	I need permanent control to concentrate	6,9%
5.	I need direct meetings with colleagues who inspire me	39,7%
6.	I can work during the time when I am most creative at the day	37,9%
7.	I don't get tired / nervous from the traffic from home to work	46,6%
8.	None of the above	12,1%

The biggest share of people claim that their creativity is improved due to the lack of negative emotions on the traffic from home to work (almost 50%), followed by the employees who find the home atmosphere as precondition to be more creative (almost 40%). On the other hand, the same share is the group of people claiming that they need direct meetings with colleagues in order to be inspired.

The next question is the following: In your opinion does home office increase your commitment to the company's goals? The answers are presented graphically on the fig. 10.
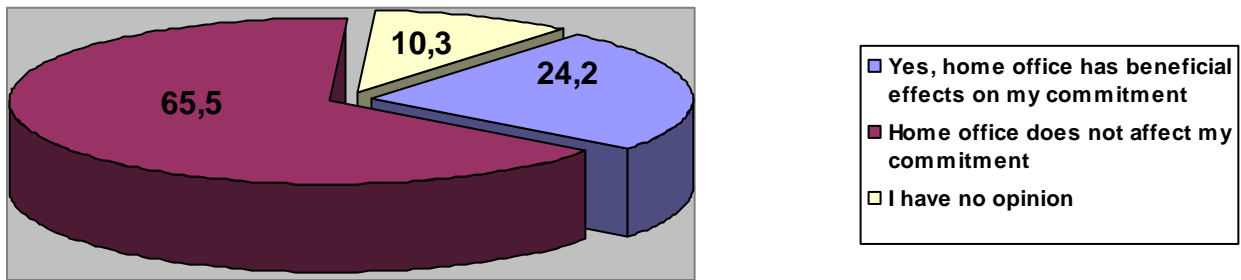
Fig. 10. Relation between home office and commitment of employees to the company's goals (in %)

The results are more than eloquent – the majority part of employees in ICT companies, responders to our survey claim that home office does not affect their commitment to the achievement the company's goals. Therefore employees are able to work in the same efforts, quality, motivation and inspiration at home as well as at traditional office. The next question reveals in details the relation between home office and engagement to the company's goals (table 4).

Table 4. Interactions between home office and employee's engagement to the company's goals

N	Alternative responses to question Please explain how home office increases / decreases the level of commitment of employees to the company's goals	Share of responses
1.	The company pays bonuses for home office working	3,4%
2.	The company shows concern and responsibility to employees in crisis situation such as pandemic	51,7%
3.	The company develops another, more complex level of working professional relationships	19%
4.	The company shows adaptability and flexibility to the complex business environment	69%
5.	The relationship between employee and company is reduced	13,8%
6.	The level of personal and group communication is reduced	34,5%
7.	Different types of teambuilding are reduced	50%
8.	Interactions between employees from different units of the company are reduced	36,2%

Here the strengths and weaknesses of the home office are visible – from one side employees admit that this is one of the reasonable and possible way to work in a complex situation, but on the other – social contacts between colleagues, direct personal communication and different types of teambuilding are strongly limited and reduced.

The next question is dedicated to relation between home office and teamwork: How does working in home office affect teamwork? Again responders were asked to choose between the following alternatives:

- Strongly positive, the team relationship are drastically improved – selected by 5,2% of responders
- Positive, the team relationship are improved – selected by 17,2% of responders
- Neutral, the team relationship are with the same level of effectiveness – selected by 37,9% of responders
- Negative, we have some difficulties on team level due to the home office – selected by 31% of responders
- Strongly negative, we have serious difficulties on team level due to the home office – selected by 3,4% f responders
- I have no opinion – selected by 5,2% of responders

Here we have to point out the relatively high level of responders (31%) claiming that home office have negative effect on the teamwork. Answers to the next question in fact reveal the roots of this specific weakness (table 5). Responders had a possibility of multiple choices.

Table 5. Interactions between home office and teamwork

N	Alternative responses to question What is (are) the reason(s) for the home office's influence on the teamwork?	Share of responses
1.	The contact between colleagues is only virtual through technical solutions of communication	62,1%
2.	Through technical solutions clear deadlines could be set which allows strong coordination between team members	22,4%
3.	Different technical solutions allows team members to have contact (both audio and video), therefore there is no need of direct traditional communication	36,2%
4.	Technical solutions allow effective teamwork	36,2%
5.	Technical solutions destroy the creative atmosphere of the real office	8,6%
6.	The active dialogue regime is not on the same level as in the real communication of the traditional office	25,9%
7.	Home office stimulates predominately individual work, not teamwork	34,5%
8.	It is difficult to make non-standard decisions that require vital discussion and opinion of the whole team	31%
9.	Home office does not affect teamwork	1,7%

34,5% of responders believe that home office is more convenient for individual work; another 31% claim that it is difficult for making unorthodox decisions. Therefore communication difficulties due to the lack of direct traditional form of communication could be summarized as major problem for teamwork in context of home office.

Next question is: How does working in a home office affect the relationships between colleagues? Responders were asked to choose between different alternatives as follows:

- Relationships between colleagues are changing in a very positive manner – selected by 6,9% of responders
- Relationships between colleagues are changing in a positive manner – selected by 10,3% of responders
- Relationships between colleagues are the same – selected by 60,3% of responders
- Relationships between colleagues are changing in a negative manner – selected by 20,7% of responders
- Relationships between colleagues are changing in a very negative manner – selected by 1,7% of responders

The majority of responders claim that home office does not affect the relationship between colleagues and other 17,2% in total have positive attitude to the interaction in the line home office-relationship. This result once again indicates from neutral to negative assessment of employees in ICT companies to home office.

Next question explores the practice of the ICT companies to encourage employees for home office. Results are graphically presented on fig. 11. The major part of responders admit that their company has such practice, while approximately 41% from responders claim that organisation has neutral position to home office. The share of people who declare that company does not encourage employees to home office remains really low (3,4%).
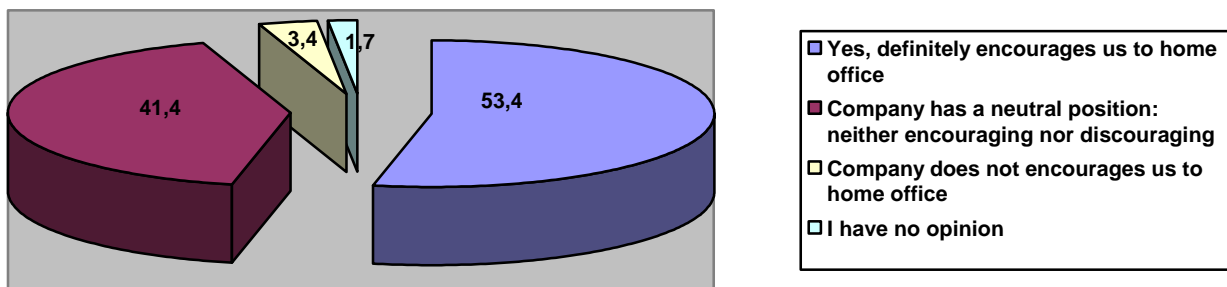
Fig. 11. Company's practice to encourage employees for home office (in %)

Motivation in working at home is the topic of the next question. We received the following results of the question "Do you feel motivated to work at home?"

- 31% of responders claim definitively positive motivation
- 17,2% of responders claim positive motivation
- 37,9% of responders claim that there is no change on the level of their motivation
- 12,1% of responders claim that they feel unmotivated
- 1,7% of responders claim that they definitely feel unmotivated and preferred working at traditional office.

Next two questions assess through the 7-points scale the personal and organizational benefits from home office (fig. 12).
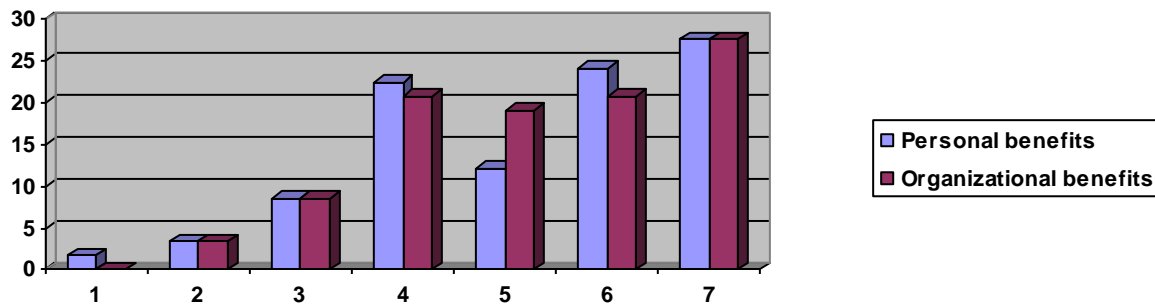
Fig. 12. Personal and organizational benefits from home office (in %)

As it can be seen the employees assess almost equally your individual benefits and organizational benefits from home office. The average score of individual benefits for employees in home office is 5,22, while the average score of organizational benefits is assessed to 5,27. The difference between these two scores is negligible and we could conclude that the employees have positive attitude to home office both for themselves and for the companies.

Among the benefits of the company from home office the responders identify the following:

- Increasing the employees motivation (29,3%)
- Increasing the employees creativity (29,3%)
- Costs reduction (77,6%)
- The only way to work in serious situation such as pandemic is (77,6%)
- Increasing the attractiveness of work (55,2%)
- Other benefits (17,2%)
- I don't consider that the company has any benefits (5,2%)

Obviously the significant part of responders (almost 78%) is convinced and accepts home office as on of the working solution in complex and serious situation of pandemic. Other responders find home office as additional extra to increase the attractiveness of job (for instance less direct managerial control, improved options for individual planning of working tasks etc).

Responders were also asked to describe the software platforms that use for coordination. Several platforms are the most often used as a tool for coordination: MS Teams, Google Hangouts, Google Meet, Slack, Skype, WebEx, Zoom, Redmine, Jira, Trelo, AnyDesk, Softone, Azure, Email, Viber. Employees admit that they use all workable solutions in order to facilitate maximum communication both among team members and with the customers.

Finally we have two open types of questions, collecting proposals for improvement home office. The most interesting are presented on table 6.

Table 6. Proposals for improvement effects from home office

	Proposals	
N	**For improvement positive effects from home office**	**General proposal for improvements**
1.	Additional technical equipment	Active communication at all levels
2.	Open and honest communication with employees	Periodic online team meetings
3.	Home office allowance (costs for Internet)	Reduced working time in Friday
4.	Better planning	Sports activities
5.	Improve control based on individual results	Varity of working tasks
6.	Hybrid type of work (home and office work)	Opportunities for life long learning and career development
7.	Couching	Off site meetings
8.	Better coordination with clear deadlines	Flexible offices (in different configuration)

As a summary of all mentioned above, several main conclusions could be made:

- The attitude of the employees in ICT sector to home office is positive. They find this measure as one of the workable and reasonable solutions for work almost in the same quality as traditional work.
- Major part of employees in ICT sector declares that there is no direct connection to the home office and their engagement to the company's goal. Therefore we could conclude that home office does not affect directly the level of employees' engagement to the company's goals – we did not find reliable evidences on this statement.
- Major part of employees in ICT sector admits that home office does not change their level of creativity.
- Majority of employees in ICT claims that home office has neutral to negative impact on the teamwork. Reasons in this regard could be found in the type of indirect communication and some difficulties in coordination, planning and decision making process.
- Home office affects from neutral to negative the relationship between colleagues in ICT companies.
- The average score of assessment personal benefits of employees from home office is 5,22 (from 7-points scale). Almost with the same average score responders assess the benefits of organisation from home office – 5,27. Some of employees find working at home as even more attractive than traditional office work in terms of lower level of control and increase possibility of good individual planning of work, tailored by specific habits of employee.

As a result we could resume that our first working hypothesis is fully confirmed empirically. As the second hypothesis is concerned "Home office does not significantly impact on the level of employees` motivation and their engagement to the achievement of the company's goals" we have partially conformed (the results approved the lack of direct connection between home office and the level of employee's engagement to the company's goals) and partially rejected – employees in ICT companies declare from neutral to positive change in their motivation to work).

Conclusions

Pandemic situation imposes new agenda in our professional and personal life. We could try to cope with this new situation in a best possible way. For companies in ICT sector home office is one of the workable solutions that allow keeping working process almost at the same quality and speed. Our findings reveal that employees in ICT companies in Bulgaria have positive attitude to home office (especially in terms of individual working planning, increasing free time and attractiveness of job positions). They assess strongly positively the benefits of home office both in personal and organizational level. Employees claim that home office increases their motivation and creativity. On the other hand we did not find reliable evidences on the direct connection between home office and employees commitment to the company's goals. For ICT employees' home office has neutral to negative effects on teamwork and relationships between colleagues mainly due to the difficulties connected to the lack of efficient direct communication as well as some trouble with planning and coordination activities.

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Kiril ANGUELOV is the Professor of IT Management and Dean of French Faculty of Electrical Engineering at Technical university of Sofia, Bulgaria. Research interests: IT Management; Reengineering; Industrial management and engineering; EU funds management. In these areas, he is recognized as a national expert by consulting both public authorities and private companies.
ORCID ID: https://orcid.org/0000-0001-7936-3290

Miglena ANGELOVA is the Assistant Prof. Dr. of Department of Management, University of National and World economy – Sofia, Bulgaria. Research interests: Creative Business Management, Change Management.
ORCID ID: https://orcid.org/0000-0002-4460-133X

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BUSINESS MODELS OF START-UPS AND THEIR IMPACT ON THE SUSTAINABILITY OF NASCENT BUSINESS[*]

Štefan Slávik [1], Richard Bednár [2], Ivana Mišúnová Hudáková [3], Branislav Zagoršek [4]

[1,2,3,4] *Department of Management, University of Economics in Bratislava, 851 02 Bratislava, Slovakia*

E-mails: [1]stefan.slavik@euba.sk; [2]richard.bednar@euba.sk; [3] ivana.hudakova@euba.sk; [4]branislav.zagorsek@euba.sk

Abstract. Start-ups are an attractive business phenomenon because they offer opportunities for personal self-realization and extraordinary business growth. The survival and sustainability of start-ups depends mainly on the quality and development of their business model. However, this assumption must be confirmed by the field research. Field research dealt with the personnel background of the business, the business idea, the structure of the business model, the impact of quality and development degree of business model on start-up performance. Each start-up was individually examined on the basis of a structured questionnaire and a personal interview with the founder. Start-up founders are relatively young and educated, but without relevant business experience. The originality of business ideas is approaching the European level, but the evidence about it is superficial and the degree of protection of ideas is low. The level of quality and development of business model blocks is unbalanced. The most developed block is the customer value proposition/product, the least developed block is the revenue streams. The business model affects the performance of the start-up, but in a small intensity and efficiency only. The examined start-ups are slow in their development and fail to sufficiently monetize the results of their efforts. Research has revealed new and original insights into the structure of the business model of start-ups, the links between the quality of blocks and their stage of development, the impact of the business model on start-up performance or sustainability, and identified some weaknesses of start-ups. Faster development of business model and purposeful selection of partners and effective cooperation with them would probably eliminate at least some of the shortcomings of the start-ups under investigation.

Keywords: start-up; business idea; business model; canvas; business performance; sustainability of business

JEL Classifications: M10, G24

1. Introduction

Start-up is a business experiment and a very small beginning enterprise that provides space for self-realization, an opportunity to develop and implement unusual and risky ideas, for uncommon satisfying of existing needs and discovering new needs. Start-ups contain potential for exceptional growth but also unforeseen and repeated failures. They are a living laboratory to investigate the establishment and maturation of a business. The progress, success and sustainability of a start-up usually depends on the quality of its business model, team and business strategy. Among these three determinants of business performance, the research focuses on the role of the business model as it is considered a primary prerequisite for the existence of a start-up. Start-up as an incomplete and imperfect enterprise must realize its business idea by creating a business model that contains all the components and conditions that are necessary for the functioning of the company. An effective business model will provide the customer with the value that the customer accepts and pays for it, while the company will cover all of its costs and earn a profit. The aim of the research, the results of which are presented in this article, is to examine the structure of the start-up business model icluding business idea, its impact on the business performance and personnel background of the startup.

2. Role of the business model in start-ups

Start-up is a team of people (P. Thiel, 2014, p. 10-11) who have associtated to achieve an unusual goal through extraordinary intellectual effort and unconventional corporate culture. Start-up is a human institution designed to create a new product or service in conditions of extreme uncertainty (E. Ries, 2011, p. 27). The Twin Enterpreneurs Regional Study reports that start-up is a young, no more than seven-year-old enterprise with a scalable business model, built on innovation or a new product that has global ambitions (Dömötör et al., 2013). N. Thanader (2012), who himself launched a successful start-up, considers their main goals as the biggest difference between a start-up and a small company. Small companies aim to be profitable and have a stable long-term value. Start-ups focus on revenue and growth potential. Wayra is an accelerator that specializes in supporting start-ups. It sets out the following conditions for entry into its environment: companies or projects must be at an early stage of development, preferably with differentiated technology and significant innovation, the product must be scalable, have potential for growth, and have the precondition for rapid growth and revenue generation (speedinvest.com/ proceed).

Start-up works in an environment of ambiguity or uncertainty, but at the same time it seeks to find concrete and usable solutions, grows dynamically and tentatively borderlessly, employs people who give up ordinary job security at the expense of exciting personal growth and achieving concrete results. It can, but may not work on the base of, technology and ceases to be a start-up after crossing certain boundaries (acquisitions, sales, profits, number of employees and others). Start-up distinguishes from a typical small and medium-sized enterprise (www.podnikajte.sk) a unique and innovative product with the potential of dynamic and global growth with an expected revenue of several tens of millions of euros. However, such performance can usually be achieved only through the internationalization of business making (Crick & Crick, 2018).

The KPMG research report (2014, p. 34) states that the weaknesses of start-ups are financial planning, expansion into new markets, fundraising, business modelling and other shortcomings. In the KPMG 2016 report (p. 3), the biggest challenges are finding a profitable and repeatable business model, scaling, sales growth and new customer acquisition. Similarly, the Booming Berlin report (2016, p. 9) on the Berlin start-up scene assumes that with a functioning business model, the start-up will evolve into a growing business within five years.

Sedlacek and Sterk (2014) note start-ups as an important source of employment growth in their research study. Dent et al. (2016) examined the role of start-ups in structural transformation and its implications for employment. Fritsch and Wyrwich (2018) examined start-ups in the context of regional knowledge and business culture. These studies show that start-ups are a serious phenomenon in economic and business development. The positive impact of start-ups on the economic and social growth of the region and the country is also confirmed in the work of Cavallo et al. (2020).

Groesser and Jovy (2015) consider the business model to be a substantial part of the company, regardless of whether the company is a small entity or a global giant. Key interaction is the link between supply and demand. Korhonen et al. (2017) consider it very important to attract a large mass of customers, provide them with completely new services, open up new markets and foster business-customer interactions in a variety of ways, notably through digital platforms. The business model is usually visualized for clarity and ease of use. Afuah (2014, p. 5) offers one of the less complex visualizations. The content of the model is the value offered to the customer, resources and activities, market segments, growth model and revenue model. The business model of Johnson et al. (2008) consists of four interconnected elements that form and provide value. Its main parts are customer value proposition, which is considered the most important, key resources, key processes and profit formula. Gassmann et al. (2014, p. 7) compiled a concept arranged in a triangle, which consists of four dimensions (three vertices and the center of gravity), which are the customer, the value offer, the value chain, the profit mechanism. Visualization is relatively simple, and therefore it is more suitable as a tool for workshops than for complex systematization. The most common visualization of the business model is the concept of canvas by Osterwalder and Pigneur (2009, pp. 15 - 44). It contains nine blocks and is a suitable compromise between summary and detailed visualization, and is therefore used as a research tool (third part of the article).

Incubators are a special chapter in the research of start-ups. Malmström and Johansson et al. (2016) have discovered interrelated challenges that limit the ability of Western European start-ups to grow into high-income businesses. They consider that incubators should be more concerned with shaping the business ecosystem than creating an environment that protects start-ups from unpleasant institutions. Another result of the research was that start-ups suffer from a lack of market orientation, a lack of entrepreneurial culture, a small domestic market, a lack of start-up capital, and universities that do not engage in entrepreneurship. Cooper and Folta (2017) and Bliemel et al. (2018) see certain solutions in the cluster cooperation, which can overcome a shortage of resources, business experience and familiarity with the market.

The key role of the business model in start-up is emphasized by Foss and Saebi (2017) when they write "For start-ups, any business act means choosing a business model, whereas in established companies applying business judgment will result in changes to the business model components or its structure". However, research studies do not explain the structure and implications of the business model of start-ups. Davila et al. (2015) point out that start-up enters an existing market with a business model that may prove economically unviable ex post. Kopera et al. (2018) explain that the technical rarity itself is rarely the source of success, but rather it is the business model behind an idea. The business model supports complex business efforts, the result is a better product and more efficient business model configuration. Block et al. (2014) write that the conditions at the birth of a company tend to influence companies over very long periods. The consequences of initial strategic decisions are usually very lasting. In addition, skills, customer relationships, personnel and capital investment at the start of a business will lock the company within some boundaries. It can be added that many of these conditions are clearly related to the business model. The importance of the model in start-ups is also recognized in technology transfer agencies, which carry out intensive innovation programs for entrepreneurs developing business models (Pettersen et al., 2016).

Rydehell and Isaksson's findings (2016) suggest that new technology-based firms (NTBFs) consider customer value propositions as the most valuable element of their business model. They also noted signs of financial

partners' influence on how founders perceive initial business models. Further research results show that some NTBF companies are developing parallel business models inside to ensure their survival in the start-up phase. The findings from Malmström and Johansson (2017) highlight that cash and expertise appear to be an essential point at the design of the business model structure in the early stages of new businesses. Teece and Linden (2017) write that, in many cases, Internet-based companies are pursuing the growth of customers at the expense of profits. The road to profitability, which is at the heart of the business model, should not be an additional idea. A well designed business model balances the value provided to the customer with the value that the provider appropriates himself. Klačmer Calopa et al. (2014) came to a similar cognition: "It is difficult to find investors for a start-up that does not bring a profit as well as potential users". Euchner and Ganguly (2014) perceive the business model in a broader context and implications: "The business model is not just a means by which a company creates and appropriates a value for the customer. Concentration on customer value creation, regardless of competitive advantage, will leave the business vulnerable due to erosion of a margin and anaemic growth". In this broader context, there is also a de facto reference to the importance of business strategy.

Recognized business matadors S. Blank and B. Dorf (2012, p. XVII) write that "Start-up is a temporary organization to look for a scalable, repeatable and profitable business model." They pay close attention to scaling. According to their knowledge (2012, p. XVIII), a scalable start-up is the work of traditional technology entrepreneurs. They set up a company with the vision that they will change the world and their enterprise will generate millions, if not billions, of dollars. Scalable start-up is initially looking for a repeatable and scalable business model.

The common and unifying denominator, which is the business model, shines in the background of the outlined topics that explore the business making of start-ups. The business model is considered a serious condition for successful business making. Although the business model or its components are considered to be a significant factor in the viability of the start-up, there are not enough specific arguments to support this assertion. Published knowledge on start-ups and their business models follow from knowledge on start-ups and their business making, but they are not confirmed, verified by a field research.

3. Objectives, research sample and methods of research

The main aim of the research is to deepen the knowledge of business models of start-ups, because on based of the studied literature, the business model and related factors are one of the main causes of success but also the failure of start-up. The partial objectives of the research are:
1. Examining the personnel background of start-ups and circumstances of the birth of business idea as they lay foundations for building a business model.
2. Knowing the content, quality and degree of development of the business model of start-up at the level of individual blocks, identify the differences between blocks and explain them.
3. Knowing the impact of the business model on start-up performance. The model is described and quantified by the quality and degree of development of individual blocks.

The research sample contains thirty start-ups (Appendix 1) operating in Slovakia in 2018 (53.3% start-ups are dealing with IT apps, 26.7% with technology, 20.0% with services, e.g. support of education, sport, administration,) The original sample contained nearly a hundred start-ups and followed up on research in 2015, 2016 and 2017 (Slávik, 2019), but had to be reduced due to failed start-ups and the reluctance of frustrated start-uppers to devote their capacity to collaborating with researchers. The common feature of the researched start-ups is approximately the same age and activity in the metropolitan area with developed infrastructure and start-up scene. Each start-up was examined by one member of the research team, who personally recorded the evaluations and answers of the founder/owner to the closed and open questions in the questionnaire and immediately explained any ambiguities.

The business model is described by means of a *canvas* visualization (Osterwalder and Pigneur, 2009) that divides the model into nine blocks: customer value proposition/product, customer segments, customer relationships, distribution channels, key activities, key resources, key partners, cost structure, revenues. This model is sufficiently concise, has more, but limited detailedness, and was therefore also used in the field research. Each block is described by open qualitative questions and closed quantitative questions. The responses are quantified, if possible, in real units, e.g. years. If this is not possible, they are expressed as percentages or, as a rule, on a five-point scale. The minimum granted value (1) means e.g. the lowest quality, simple solution, local level, high cost, common standard, mass market, etc. The maximum granted value (5) means world quality, sophisticated solution, world class, low cost, full original, customization, etc. Norman (2010) studied the use of ordinal scale as a continuous variable. He concluded that ordinal scales like Likert scale could be used in parametric statistics without the risk of getting to a wrong conclusion. Blocks of the business model are also evaluated according to the degree of completion or degree of functionality in tens of percent.

In addition to the business model, the research focused on the staffing of the start-up, the creation of a business idea, positive and negative experiences with business making and pivots (fundamental changes in the development of start-up).

The qualitative research of the business model is based on induction (deriving a general conclusion based on knowledge about particulars) and exploring unique and non-recurring phenomena. The advantage of a non-numerical solution is high validity, detailed and in-depth knowledge, but it is associated with a disadvantage that may be of low reliability, because the result may not be generalizable. Some structure and regularity are being found in the qualitative data.

Quantitative research of business model is based on descriptive statistics, correlations, and linear regression. Descriptive statistics use the proportion (%) of the investigated parameter to the whole research sample or its mean value to describe the investigated fact. Mean data values are generally expressed as an arithmetic mean unless otherwise indicated. In selected cases, they are expressed in median, which better expresses the mean value because the sample is small and contains some large variations.

Correlation analysis was used to investigate the relationships between the selected data (Tables 4, 5). The Kendall's tau b test was used to calculate the correlation coefficient, which is suitable for non-parametric measurement of the strength and direction of the connection between two variables, measured at least on the ordinal scale (statistics.laerd.com/spss-tutorials/kendalls-tau-b-using-spss-statistics.php). The non-parametric nature of the variables was determined on the base of Shapiro Wilk normal distribution test. The value of the correlation coefficient ranges from -1 to +1. A value of 0.1 to 0.3 (-0.1 to -0.3) means a weak relationship, a value of 0.3 to 0.5 (-0.3 to -0.5) is a moderate association and a value of 0.5 to 1.0 (-0.5 to -1.0) indicates a very strong relationship (statistics.laerd.com/statistical-guides/pearson-correlation-coefficient-statistical-guide.php).

Linear regression was used to investigate the relationship between the business model and start-up performance (Tables 6, 7, 8, 9). Dependent variables are business model blocks that have quality (uniqueness, originality, level)*: 1 - local, 2 - national, 3 - central European, 4 - European, 5 - world* and degree of development*: 0 – 100 % (in tens of %)*. An independent variable is the performance of a start-up that is measured as the number of users: *1 - none, 2 - several, 3 - several tens, 4 - several hundreds, 5 - several thousand, 6 - several ten thousand or more, 7 - more than a hundred thousand*, number of paying users/customers: *the scale is the same as for users* and sales: *1 - none, 2 - 1 – 10 000 €, 3 - 10 001 – 50 000 €, 4 - 50 001 – 100 000, 5 - 100 001 – 500 000 €, 6 - 500 001 – 1 000 000, 7 - more than 1 000 000 €*. Initially, a linear regression was applied to examine the relationship between individual independent variables (business model blocks) and performance indicators, and

then multiple regression was applied to examine the relationship between the business model in aggregate (all independent variables together) and performance indicators.

The predominant method of discussion is to assess the excellence of new knowledge, respectively exceptional properties of start-ups and identification of paradoxes (interesting opposites or contradictions). Start-ups should deliver exceptional results that express in extraordinary quality and originality of their products and extraordinary growth. It is assumed that internal quality will turn into external quality.

4. Research results

4.1 Elementary results/descriptive statistics

Staffing (mean values are expressed in median).
Start-up leader, its founder is 33 years old. A significant majority of founders (86.7%) have a university education of the second degree and several years as a rule employment practice (56.7%) before establishing the start-up, but they lack the authentic business experience. The positive impact of education on business starting is also confirmed by a study of Hunady et al. (2018). In start-up there are working 5 employees who are 30 years old and are mostly university educated (83.3%). The average lifetime of the surveyed start-ups by the end of 2018 is 4.9 years.

Business idea
Start-ups are making a business mainly in the industry of information and communication technologies (46.4%). The rest of the start-ups operate in very diverse industries, e.g. industrial production, agriculture, other research, production of machinery, services, arts, entertainment, recreation and others.

Business ideas of studied start-ups can be divided into the following groups:
(a) collecting, pooling and producing specific information and fact sheets: *Adwork, Venzeo, Muvity, Challengest, JobAngels, Luigi's Box*; support of CV writing - *KickResum*e, a search of human resources with specific skills and competencies for temporary use - *SkillsMill*, training in aviation regulations - *alearn.aero*,
b) linking things and various objects with information on their properties, operation and use: *eDocu, Venzeo, Addwork*, geolocation - *Mapilary*, food distribution monitoring – *Orderlord,*
(c) satisfying traditional needs in a simpler, faster and more convenient way: the cashier system for restaurants - *Storyous*, invoicing - *Sufio*;
d) strengthening security, comfortable, simple and safe access to objects, buildings, apartments, cars: *share.vi*, personal security - *Beesafe*, human face identification and security – *Matsuko,*
e) supporting and developing ideas from other authors - *Revolware*,
(f) an original, as a rule, tangible product that meets an existing need in a new or more efficient way: *Microveg, Greenway, Speekle, iBed Pro, Octago, RVMagnetics, GA Drilling, Quake resQ*; not all ideas are based on complex and new technologies, e.g. new version of old service - *Green Post*.
Quoted business ideas are implemented as software applications (66%) and products (33%), which are predominantly tangible.

The circumstances and causes of the origin of an idea are reflected in the content of the business idea. Here are some examples:
- the original idea did not have sufficient business potential and has therefore undergone one or more changes (pivot), e.g. one app carries several similar services,
- the need for extensive and readily available information, e.g. about the facility being operated,
- demand for specialists, e.g. for human resource management,,

- establishing a sense of security, e.g. identification of faces and figures, warning before earthquake,
- confusing situation in some environment, e.g. real estate market, logistics of orders and deliveries of ready meals,
- personal experience of the entrepreneur, e.g. physical or mental discomfort; urgent lack of something, e.g. information, factory operators,
- the original services are lengthy, inconvenient, complicated, unautomated and not linked to other services or information systems.

The originality of the business idea is implicit, officially unconfirmed and considerably alleged (90% of the sample). The founders' arguments in favour of the originality of the idea are diverse and based mainly on personal experience and subjective knowledge of the competition, which are often imperfect:
- industry knowledge and entrepreneurial experience confirming that the start-up under investigation is the only enterprise in the industry: *eDocu, Octago*,
- the first enterprise of its kind: *Speekle*,
- national originality, the only company in Slovakia: *Revolware, Microveg*,
- the originality of the idea is small, but the idea is implemented quickly and consistently: *Greenway, Sli.do*,
- considerable interest of foreign clients: *Matsuko*,
- very low price, 100 times lower than the competitive price: *Quake resQ*, or low price: *Storyous*,
- technological complexity, but without patent protection: *iBed Pro*,
- great adaptation to customer needs: *Venzeo*,
- there are several competitors, but startup has strong and loyal customers: *Orderlord, Sli.do*,
- the product resembles competing products but is different: *Luigis Box*,
- the product is complex and complicated or hybrid: *KickResume, Mapilary, Green Post, KickResume. elearn.aero*.

Explicit, officially confirmed originality, patent protection has been found only in start-ups *share.vi, GADrilling, RVMagnetics* (10% of the examined sample). The degree of originality of the whole sample of business ideas measured on a five-point scale is 3.87, thus approaching originality at European level.

The development of the business idea was captured in the following phases: *1 - idea/ concept/research, 2 - product development, 3 - product prototype/testing, 4 - first revenue, 5 - rising revenue*. Most business ideas are situated in phase 4 (first revenue) or 5 (growing revenue), several ideas are in phase 3 (prototype completion and testing), the only idea is in phase 1 (idea and concept). The average development phase measured on a five-point scale is 4.1, hence at the level of the first revenue. Phases 4 and 5 are characterized by continuous product innovation and improvement, so far independently and without exit. Sales revenues are growing, but not fast, rather slow, so start-ups usually do not attract strong investors. Start-ups are beginning to penetrate foreign markets and the challenge is not only to maintain growth but also to speed up significantly.

The start-up financing cycle is captured in the following phases: *1 – pre-seed capital (angel phase, idea, no product), 2 - start-up capital (seed phase, product developing and prototyping, market interest testing), 3 - capital for initial development and further growth (series A/B phase, 1st, 2nd round, investment in a company that already has customers and generates revenue), 4 - development capital (3rd round, mezzanine capital), 5 - IPO (initial public offering).* Most business ideas (44%) are situated in phase 3 of the investment cycle (initial and growth capital). 13% of ideas are in phase 1 (pre-seed capital), 30% of ideas in phase 2 (start-up capital), 10% of ideas in stage 4 (development capital) and 3% of ideas in phase 5 (IPO). The average phase of the financing cycle, measured on a five point scale, is 2.6, hence between start-up capital and initial development capital.

About 20% of start-ups are self-financing and want to do business with their own resources only. The rest relies on angel and venture investors who are expected to have business experience, advices and business contacts in addition to money. Start-ups do not receive any bank loans and grants, with the exception of GA Drilling, who received loans from the SZRB (Slovak guarantee and developing bank) and grants from EU programs. The Flemio accelerator provides pre-launch capital of 50,000 € and the venture investor Neulogy grants a normal tranche of 200,000 €. The process of raising external capital is lengthy. Domestic venture capital (VC) resources are very limited and institutional capital from foreign VC entrepreneurs and strong VC funds is almost unavailable. Start-ups invest mainly in prototype development and marketing. Marketing is a proxy term for advertising that serves to promote brand, product, and service awareness. One-off investments are not enough to cover the long term operation of a start-up and therefore have to be repeated in line with the product development. Sale revenue is also not enough to finance day-to-day operations and product development, so most start-ups need external investment support.

Business model
Customer value proposition was examined in the chain of need → value → minimum viable product (MVP). The example can be quoted: the chain of Quake resQ start-up. Need: increasing personal safety → value: measuring the size of seismic waves that a person has not yet captured with his senses → MVP: personal miniature device for wave detection. **Satisfied needs** are not significant news. The rate of their novelty was measured on the scale: *1 - exists long-term, 2 - exists short-term, 3 - just discovered/observed, 4 - just invented/created*, and reached value of 1.46. Just discovered/observed and just invented/ created need occurred only in two cases. The following needs have been identified:
- find and acquire the missing human, material and information source, worker, staffer, information, data, e.g. a qualified employee for a permanent job or an expert for a temporary job, perform a professional work, find a real estate or property information (item, object, machine, etc.)
- get easy access into something or to something, e.g. car, hotel room, power source, natural resources,
- increase personal security,
- get an overview about the situation, e.g. movement of consignments, cars, the occurrence of negative events (waste stored in the wrong place), support for web search, getting feedback about a performance, facilitating and streamlining the entire food delivery process,
- promote a healthy lifestyle, e.g. exercising, eating, assistance at handicap,
- simplify and accelerate complicated processes,
- expand e-mobility.

The identified needs are met by the following **values**: time and cost savings; simplifying, facilitating processes and communication that were previously complex and labour intensive, inefficient, delayed; entirely new value that did not exist before.

The vehicle of values is a **minimally viable product**, which is an application on a smartphone or computer, very complex software, video record, training courses, various hardware, technical objects/equipment and technology. The degree of difference of the proposed products compared to similar products was measured on a scale: *1 - common standard, 2 - moderate difference, 3 - greater difference, 4 - great difference, 5 - complete original*, and reached level of 2.63. Only 17% of the researched start-ups develop a completely original product. Quality or excellence of product measured on a five-point scale is 4.0, exactly at European level (53.3% of examined start-ups). World-class quality, respectively excellence of product identified 27% of the researched start-ups. Developed products are finished at 76.2% on average.

Customer segments. Typical customers of the surveyed start-ups are larger to large enterprises (approximately 70%), public administration institutions (approximately 10%) and inhabitants (approximately 20%). Customers

are demanding, they have expectations and requirements measured on a five-point scale are on the level of 3.8, almost at European level. One third of start-ups have customers with world-class requirements. The average market segmentation, measured on a five-point scale, is on the level of 2.4 between a segmented market with several segments (50% of the examined start-ups) and one segment. Start-ups identify and know their customers at 80% on average. On average, start-ups operate on the Central European market, but up to a third of them operate on the world market. They enter foreign markets on average from half a year to a year after the start of the sale of the product on the domestic market. Immediately after launching the product on the domestic market, 20% of the researched start-ups enter the foreign market as well. Foreign branches have so far been established by 29% of the researched start-ups.

Customer relations are established and maintained at professional conferences and events attended by larger to large enterprises and public administration institutions. Customer relationships are also established and strengthened in face-to-face meetings and consultations, personal sales, social networks and satisfied customer references play an important role. An attractive product, high-end and original technology, a lower price, a unique distribution network (no other major competitors) and qualified sales also support relationships with customers. In customer relationships, personal assistance is predominant when the customer communicates directly with the seller, and extra personal assistance when the customer is assigned to a specific seller. The quality and uniqueness of these relationships, measured on a five-point scale, is on average at central European level (3.0). 13.3% of the surveyed start-ups declare world-class relationships. Customer relations have so far reached on average 64.7% compared with the required level of 100%.

Dominant **distribution channels** are custom website/FB online sales (53.3% of the surveyed start-ups) and personal sales with own sellers (33.3%), hence direct customer addressing, direct sales, personal delivery and product installation at the customer. Marginal distribution channels are conferences, lectures and partner stores. The most effective channel is personal sales, personal contact and relationship. Personal meetings are the most expensive, time and people consuming, but these channels are as functional as possible. The cheapest distribution channel is web/self-service shop. The quality and uniqueness of the distribution channel, measured on a five-point scale, is 2.8 on average, thus approaching the Central European level. Distribution channels are completed on average at 62%.

Customers are used to waiting for the offer, they are more passive, and therefore personal addressing and servicing suit them. On the other hand, people are used to searching for information, commonly communicating through social networks, but the greatest benefit for them will be provided by personal product testing and personal experience. Ordering a service or product using an Internet application is a common standard in many industries and market segments and is also used by start-ups.

Personal selling is preferred because it does not need any intermediaries, and some start-ups do not want them. At a face-to-face meeting, the product is professionally demonstrated and explained, a start-up has got totally its business making under control and personal contact with the customer enables a better understanding of the customer's needs and his environment. The disadvantage is higher personnel costs, because it is necessary to send out an employee to the customers and possibly establish a subsidiary. Among the various forms of entry into the foreign market, direct export dominates (77%). About one-third of the examined start-ups are not interested in how competing companies make sales and the other two-thirds report that their sales practices are the same or very similar.

Customer value proposition requires **key resources**, especially experts, developers and programmers. In addition, applied software, industry knowledge and technology mastering are needed. Significant resources are the hardworking and cohesive team, finance, technologies and the distribution network. Among these resources, there is a lack of quality and experienced people, top experts/specialists in the desired field, because they are expensive.

There is also no money to pay for other quality staff, development, production and sales. The quality, uniqueness of resources is slightly above the Central European level (3.3) and resources are available in the range of 61.3% of the required final state (100%). The sources were also evaluated according to their rarity and imitability (Table 1). The quantification of these features again confirms the central role of human resources in start-up business making.

Table 1. Rareness and imitability of business model resources

Resources of business model	Rareness of resources	Imitability of resources
humans (know how, knowledge and experiences)	**4,0**	**4,1**
humans (diligence and persistence)	3,6	3,45
finance	3,41	2,31
technologies	2,38	2,79
venues	**1,62**	**1,55**

Scale of rareness: 1 (absolutely accessible, min. rare) – 5 (absolutely non-accessible, max. rare)
Scale of imitability: 1 (absolutely imitable) – 5 (absolutely non-imitable)
Source: own field research

Offered value requires **key processes**, which are mainly product development, testing and development, sales, marketing (advertising), communication with customers and their servicing, and eventually further improvement of the product mainly based on customer requirements. The start-ups under investigation lack processes such as post-sales services, customer communication, care for customer during service usage, troubleshooting and answering to the complaints, various support services that require reinforcing the sales and recruitment of merchants. These processes are missing because some start-ups are only in the early stages of development or are limited by lack of finance, which is more often the reason. The quality, uniqueness of the processes is at the Central European level (3.0) and is developed at 67.2% of the required final state (100%).

Key partners provide the missing resources, which are money for day-to-day operations and investments (35% of partners); product know-how in the form of technology (18% of partners), mentoring, software; know how about the market, entering the foreign market and feedback from customers. Partners rarely provide production realization of the developed product or access to the distribution network. Partners also provide some processes, such as the distribution of information about a start-up; advertising and promotion; sales, distribution of products and services at home and abroad (most common case); solution testing; software development and mediation of business contacts. About half of the examined start-ups do not state any activities that partners would undertake. Quality, excellence of partners is between the Central European and European levels (3.6) and partners are developed at 60.7% of the required final status (100%).

Personnel costs (54%) account for the largest share of the cost of key start-up resources, including the salaries of employees, especially those of highly qualified professionals. Among the key activities are the most expensive product development (29%), advertising, promotion (20%) and sales. Costs in relation to the resulting product prices, measured on a five point scale, are between high and low level (2,9), as is the case for the ratio of fixed and variable costs (3,1), whose relationship is almost balanced. The costs in relation to the relevant competitors are approximately the same (3.5). The cost structure will continue to change, having stabilized at 61.0% during the research period.

Revenue flows. Customers pay for the offered value/usefulness, although they formally pay for the purchase of an application, product or service. Formal payments are for sale of service (69%), product (19%), mediation of sale of service (6%), sale of license (3%) and other sale (3%). Payment is made as a subscription/flat rate (52%), on sale (19%), after billing (26%) and otherwise (3%). The price of a product or service is determined as the sum of costs plus margin (37%), according to market research (21%), at the average market price (13%) and intuitively

(29%). The premium price is required by 23.4%, the cream price by 3.3%, the introductory price by 40.0%, the discount price by 10.0%, and the linked price by 13.3% of start-ups.

Customer value proposition is often identified with a product, although the product is merely a material carrier of value/benefit. In fact, customers pay for instant and continuous access to information - *eDocu*, access to various assets - *share.vi*, finding a scarce resource, e.g. talented, quality employee - *SkillsMill*, eliminating personal shortages - *Speekle*, finding a job - *Challengest*, provided advice - *Revolware*, saved time and lower costs - *Green mail*, more knowledge - *Sli.do*, simplifying and accelerating restaurant operation - *Storyous*, unique benefit brought by unique product feature - *RVMagnetics*, comfort, variability and originality of the product - *iBed Pro*.

In particular, the unfinished product is the cause of not generating income or insufficient volume of revenues. Start-ups are working on its development, or are not working sufficiently intensively, or are not working on development at all, because the money has run out and start-uppers are expending their efforts especially on raising more money. Other reasons for not generating sufficient revenue are the small number of paying users/customers and the underdeveloped market, which shows little interest in a product that is likely to overtake expectations and possibilities of customers. On average, surveyed start-ups have several tens to several hundreds of users who do not pay for a product or service, several to several tens of paying users (customers) who pay for a product and generate sales that cover approximately 75% of start-ups costs. Profit earns 30% of start-ups. However, the mean values of the economic indicators of the surveyed start-ups show (Table 2) that the average start-up does not earn profit and its gross margin is very modest.

Table 2. Mean values (median) of economy indicators of surveyed start-ups in 2017 year

Indicator	Value
Sales/revenues (euro)	76 707
Profit (euro)	0,0
Other earnings (euro)	35
Assets (euro)	107 331
Equity (euro)	15 161
Total indebtedness (%)	64,5
Gross margin (%)	4,46

Total indebtedness = (outside resources + time distinguishing)/assets. It expresses in what extent a company finances its assets from outside resources.
Gross margin = value added/total sales. It expresses how many per cents remained to a company after payment of costs.
Source: www.finstat.sk

It is clear from the summary (Table 3) that the best quality, most original and exceptional business model block is the customer value proposition delivering to the customer through the distribution channel, which is, however, the least quality block in addition to the revenue flows block. The most developed block is customers, but it is weakened by significantly less developed blocks of customer relationship development and distribution channels. The least developed block is revenue flows.

Table 3. Summary assessment of business model blocks

Blocks of business model	Quality (1 – 5)	Blocks of business model	Degree of development (%)
Customer value proposition/product	**4,0**	Customer segments	**80,34**
Customer segments	3,8	Customer value proposition/product	76,2
Key partners	3,6	Key activities	67,2
Structure of costs	3,5	Customer relationships	64,7
Key resources	3,3	Distribution channels	61,9
Key activities	3,0	Key resources	61,3
Customer relationships	3,0	Key partners	60,7
Distribution channels	**2,8**	Structure of costs	**60,7**
Revenues*	2,43	Revenues**	48,5/41,4

*Sales, **number of users/number of customers
Block of revenues is measured on a 7-point scale, and therefore revenues in table are converted to a 5-point scale to make them comparable to other blocks.
Source: own field research

Positive experiences, strengths, achievements, right decisions of start-ups are very diverse, but the main and prevailing are the acquisition of large, respectively important clients, entry to foreign market, good identification of target customer, ability to recognize the right way of further development, diversification of customers, interest and increase of clients, personal sale, customer feedback.

Negative experiences, shortcomings, failures, mistakes are also very diverse, but the main and prevailing are a dysfunctional team and small funds, poor-quality human resources, respectively lack of quality people, especially specialists, slow development of the prototype due to lack of money, more agile competition and extremely difficult to attract an investment of several million euros.

Similarly, **pivots** (fundamental changes in the development of start-up) are very diverse, and therefore the unifying feature of their content cannot be found. Here are just a few examples:
- from a small number of large clients to a larger number of smaller clients - *eDocu*,
- from e-lock, which is a platform for common access to doors, to access to various objects of the shared economy - *share.vi*,
- from the extraction of geothermal energy (hot water wells) to deep wells for oil and gas - *GADrilling*,
- separation of support infrastructure from the product itself - *Greenway*,
- from creating 3D small figures to transmitting 3D image of real people (3D telepresence) - *Matsuko*,
- from an office building to an informal space, thus breaking free from the normal in-company environment - *Green Post*,
- from an external distributor to own personal sales - *Microveg*,
- from self-service to explaining to the customer what the value of the product is - *Sli.do*,
- in addition to the original product for gastronomy/restaurants also a modification for large companies and other industries, e.g. banks and the public sector - *Staffino*.

Despite the content discrepancy of pivots, the start-ups under investigation are characterized by insufficient pivoting. There are few changes in addition to them at a slow frequency, generating new ideas is lengthy, respectively start-ups have an aversion to discard old ideas and lack a steady inclination to enthusiastic and tireless search for new ideas. If there was a pivot, it wasn't too much of a change.

4.2 Relational results/Correlations

Correlation analysis examines the tightness of dependency between business model blocks that are quantified by the degree of quality and the degree of development. The dominant block in the business model (Table 4), whose blocks are expressed in terms of quality, is the product/customer value proposition because it shows the most relevant/close relationships with the other blocks of the model. Key partners and cost structure, in turn, show a minimum of close relationships. The key partners and cost structure are the dominant blocks in the business model (Table 5), which blocks are expressed by the degree of development. Customers play a weaker role in this case. The business model is very consistent in both ways of expression, but the model measured by the degree of development shows more integrity. The ascertained consistency creates good prerequisites not only for regression analysis but also for the practical functioning of the model.

Table 4. Correlation between blocks (quality) of business model. Kendall's tau B test.

Quality of blocks	CVP/ Product	Customer segments	Customer relationships	Distribution channels	Key resources	Key activities	Key partners	Cost structure	Revenues
Customer value proposition/ product	1,000								
Customer segments	**0,608****	1,000							
Customer relationships	**0,384***	**0,489****	1,000						
Distribution channels	**0,358***	0,276	**0,395***	1,000					
Key resources	**0,403***	**0,385***	**0,309***	0,289	1,000				
Key activities	0,117	0,250	0,255	**0,343***	**0,553****	1,000			
Key partners	**0,330***	0,298	0,247	0,149	**0,553****	0,219	1,000		
Cost structure	0,021	0,031	-0,228	**-0,325***	0,231	0,009	0,209	1,000	
Revenues	-0,097	0,023	0,177	0,100	0,041	0,222	0,238	-0,126	1,000

* correlation is significant at the 0,05 level

** correlation is significant at the 0,01 level

Source: own field research

Table 5. Correlation between blocks (degree of development) of the business model. Kendall's tau B test.

Degree of blocks development	CVP/ Product	Customer segments	Customer relationships	Distribution channels	Key resources	Key activities	Key partners	Cost structure	Revenues
Customer value proposition/ product	1,000								
Customer segments	0,165	1,000							
Customer relationships	0,311*	**0,385****	1,000						
Distribution channels	**0,376****	0,246	0,541**	1,000					
Key resources	**0,335****	0,314*	**0,422****	**0,437****	1,000				
Key activities	**0,472****	0,331*	**0,540****	**0,420****	**0,485****	1,000			
Key partners	**0,374****	**0,567****	**0,368****	**0,353****	**0,455****	**0,519****	1,000		
Cost structure	**0,379****	0,297*	**0,408****	**0,455****	**0,590****	**0,461****	**0,374****	1,000	
Revenues	**0,361***	**0,435****	**0,438****	**0,386****	**0,629****	**0,498****	**0,427****	**0,618****	1,000

* correlation is significant at the 0,05 level
** correlation is significant at the 0,01 level
Source: own field research

Of the selected attributes (Table 6), the business idea development/business idea development phase, the investment cycle/financing development phase and the type of territorial market/from local to international expansion have a statistically significant impact on start-up performance. This impact is also reflected in the relatively high values of the B and R Square coefficients. The other attributes examined are not statistically relevant.

Table 6. Relationship (linear regression) between selected attributes of start-up and its performance

Attribute	Statistical indicators	Performance of start-up		
		Number of users	Number of paying users	Sales
Age of founder	Unstandardized Coefficients - B	-0,035	-0,016	0,105
	Unstandardized Coefficients - Std. Error	0,042	0,045	0,043
	R Square	0,027	0,005	0,179
	Sig.	0,405	0,718	**0,022***
Age of team	Unstandardized Coefficients - B	-0,044	-0,061	0,173
	Unstandardized Coefficients - Std. Error	0,075	0,073	0,074
	R Square	0,013	0,028	0,168
	Sig.	0,560	0,405	**0,027***
Originality of idea	Unstandardized Coefficients - B	-0,033	-0,031	-0,026
	Unstandardized Coefficients - Std. Error	0,057	0,058	0,066
	R Square	0,012	0,011	0,005
	Sig.	0,570	0,589	0,701
Development phase - idea	Unstandardized Coefficients - B	*0,870*	*0,972*	0,728
	Unstandardized Coefficients - Std. Error	0,265	0,256	0,330
	R Square	*0,285*	*0,357*	0,148
	Sig.	**0,003***	**0,001***	**0,036***
Development	Unstandardized Coefficients - B	0,453	*0,906*	0,933

phase - financing	Unstandardized Coefficients - Std. Error	0,330	0,299	0,336
	R Square	0,065	*0,261*	0,216
	Sig.	0,181	**0,006***	**0,010***
Rate of product difference	Unstandardized Coefficients - B	0,030	0,105	0,233
	Unstandardized Coefficients - Std. Error	0,357	0,380	0,396
	R Square	0,000	0,003	0,013
	Sig.	0,933	0,784	0,560
Kind of territorial market	Unstandardized Coefficients - B	*0,442*	*0,481*	0,637
	Unstandardized Coefficients - Std. Error	0,182	0,184	0,198
	R Square	*0,180*	*0,208*	0,270
	Sig.	**0,022***	**0,015***	**0,003***

* significance at the 0,05 level
Source: own field research

Among the blocks expressed in quality (Table 7), customer relations, distribution channels, key resources and key activities are influencing start-up performance. This effect is also confirmed by the relevant values of B and R Square coefficients. However, none of the blocks affects performance expressed in revenues. Almost all blocks expressed by the degree of development (Table 8) have a statistically significant impact on start-up performance measured by the number of users and the number of paying users. Revenue is only affected by customer relationships, key resources, key activities and cost structure. However, the B and R Square coefficients are smaller than in the case of the qualitatively measured model. Key partners have the least impact.

Table 7. Relation (simple linear regression) between the quality of individual blocks and the performance of the start-up

Quality of blocks	Statistical indicators	Number of users	Number of paying users	Sales
Customer value proposition/ product	Unstandardized Coefficients - B	-0,220	-0,143	-0,298
	Unstandardized Coefficients - Std. Error	0,039	0,445	0,465
	R Square	0,011	0,004	0,015
	Sig.	0,581	0,750	0,528
Customer segments	Unstandardized Coefficients - B	0,137	0,329	0,105
	Unstandardized Coefficients - Std. Error	0,283	0,316	0,339
	R Square	0,009	0,040	0,004
	Sig.	0,632	0,307	0,760
Customer relationships	Unstandardized Coefficients - B	*0,475*	*0,502*	0,361
	Unstandardized Coefficients - Std. Error	0,228	0,262	0,309
	R Square	*0,149*	*0,133*	0,054
	Sig.	**0,047***	**0,067**	0,254
Distribution channels	Unstandardized Coefficients - B	*0,462*	*0,491*	0,175
	Unstandardized Coefficients - Std. Error	0,258	0,262	0,318
	R Square	*0,106*	*0,119*	0,012
	Sig.	**0,085**	**0,073**	0,586
Key resources	Unstandardized Coefficients - B	0,359	*0,488*	0,059
	Unstandardized Coefficients - Std. Error	0,218	0,216	0,278
	R Square	0,091	*0,164*	0,002
	Sig.	0,112	**0,033***	0,835
Key activities	Unstandardized Coefficients - B	*0,452*	*0,720*	0,340
	Unstandardized Coefficients - Std. Error	0,216	0,199	0,270
	R Square	*0,140*	*0,335*	0,057
	Sig.	**0,046***	**0,001***	0,220
Key partners	Unstandardized Coefficients - B	0,511	0,552	0,509
	Unstandardized Coefficients - Std. Error	0,336	0,329	0,404
	R Square	0,082	0,098	0,060

	Sig.	0,140	0,105	0,220
Cost structure	Unstandardized Coefficients - B	-0,030	-0,152	-0,376
	Unstandardized Coefficients - Std. Error	0,368	0,378	0,398
	R Square	0,000	0,006	0,033
	Sig.	0,936	0,691	0,353

* significance at the 0,05 level
Source: own field research

Table 8. Relation (simple linear regression) between the degree of development of individual blocks and the performance of start-up

Degree of blocks development	Statistical indicators	Number of users	Number of paying users	Sales
Customer value proposition/ product	Unstandardized Coefficients - B	0,025	0,034	0,027
	Unstandardized Coefficients - Std. Error	0,012	0,012	0,015
	R Square	0,138	0,236	0,107
	Sig.	**0,048***	**0,009***	0,089
Customer segments	Unstandardized Coefficients - B	0,029	0,035	0,013
	Unstandardized Coefficients - Std. Error	0,014	0,013	0,018
	R Square	0,152	0,219	0,020
	Sig.	**0,040***	**0,014***	0,477
Customer relationships	Unstandardized Coefficients - B	0,034	0,033	0,026
	Unstandardized Coefficients - Std. Error	0,009	0,009	0,012
	R Square	0,349	0,321	0,151
	Sig.	**0,001***	**0,002***	**0,041***
Distribution channels	Unstandardized Coefficients - B	0,026	0,029	0,019
	Unstandardized Coefficients - Std. Error	0,011	0,010	0,013
	R Square	0,182	0,232	0,077
	Sig.	**0,024***	**0,009***	0,161
Key resources	Unstandardized Coefficients - B	0,047	0,058	0,042
	Unstandardized Coefficients - Std. Error	0,012	0,010	0,016
	R Square	0,365	0,571	0,205
	Sig.	**0,001***	**0,000***	**0,016***
Key activities	Unstandardized Coefficients - B	0,031	0,039	0,035
	Unstandardized Coefficients - Std. Error	0,012	0,011	0,015
	R Square	0,198	0,358	0,182
	Sig.	**0,018***	**0,001***	**0,027***
Key partners	Unstandardized Coefficients - B	0,022	0,031	0,022
	Unstandardized Coefficients - Std. Error	0,011	0,010	0,013
	R Square	0,129	0,294	0,099
	Sig.	0,061	**0,003***	0,109
Cost structure	Unstandardized Coefficients - B	0,042	0,050	0,051
	Unstandardized Coefficients - Std. Error	0,011	0,010	0,014
	R Square	0,340	0,514	0,337
	Sig.	**0,001***	**0,000***	**0,002***

* significance at the 0,05 level
Source: own field research

Table 9 records the results of multiple regression between a business model that is perceived as a summary of blocks, and the performance of a start-up. Thus, the relationship between the whole model, not the individual blocks, and the start-up performance is examined. The purpose of such an examination is to distinguish the individual impact of blocks and the aggregate impact of the model on start-up performance. The impact of the model on performance is statistically significant except for the impact of a qualitatively measured model on revenues. R Square and Adjusted R Square values measured for multiple regression are higher than for single

regression, and performance of start-up is induced from 57.1% to 75.2% by the quality and degree of business model development, while the degree of development explains this impact somewhat more than quality of model. However, the values of the B coefficients are evidently lower for the model measured by the degree of development than for the model measured by quality.

Table 9. Relationship (multiple linear regression) between the quality and degree of development of the entire business model and the performance of the start-up

Blocks	Impact of blocks quality on the performance			Impact of blocks development degree on the performance		
	Number of users	Number of paying users	Sales	Number of users	Number of paying users	Sales
Customer value proposition/ product	-0,924	-1,091	-1,577	0,009	0,008	0,014
	(0,580)	(0,601)	(0,880)	(0,014)	(0,012)	(0,018)
Customer segments	-0,181	0,157	0,434	0,016	0,010	-0,044
	(0,346)	(0,393)	(0,577)	(0,024)	(0,019)	(0,029)
Customer relationships	0,433	0,206	0,520	0,032	0,010	0,036
	(0,258)	(0,300)	(0,429)	(0,015)	(0,013)	(0,019)
Distribution channels	0,843	0,256	0,145	-0,016	-0,010	-0,029
	(0,299)	(0,316)	(0,453)	(0,015)	(0,012)	(0,018)
Key resources	0,154	0,114	-0,595	0,052	0,054	0,023
	(0,376)	(0,435)	(0,625)	(0,023)	(0,017)	(0,026)
Key activities	-0,063	0,485	0,790	0,003	0,017	0,010
	(0,317)	(0,351)	(0,512)	(0,017)	(0,014)	(0,021)
Key partners	0,274	0,493	0,529	-0,043	-0,021	-0,016
	(0,378)	(0,397)	(0,578)	(0,018)	(0,015)	(0,022)
Cost structure	-0,161	-0,256	-0,113	0,011	0,009	0,048
	(0,431)	(0,442)	(0,636)	(0,018)	(0,015)	(0,022)
R	0,77	0,756	0,656	0,802	0,867	0,786
R Square	**0,594**	**0,571**	0,431	**0,643**	**0,752**	**0,617**
Adjusted R Square	0,402	0,37	0,146	0,475	0,635	0,426
Std. Error of the Estimate	1,227	1,309	1,865	1,275	1,049	1,564
Sig.	**0,024***	**0,034***	0,228	**0,010***	**0,001***	**0,022***

* significance at the 0,05 level
Source: own field research

5. Discussion

Personal background
Personnel background is made up of people with the same education as in the previous research (Slávik, 2019), but the founders are getting older and approaching with their age the founders of start-ups in developed countries. Education and experience are mainly used for product development, they are reflected less (little?) in more sophisticated market entry, customer acquisition and monetization of business efforts. Start-ups are small entities due to their age, they remain micro enterprises with very limited work and intellectual capacity, which fundamentally determines the speed of development and growth of business.

Business idea and start-up development cycle
Information and communication technologies dominate the business ideas. Software applications are easier to "manufacture" and sell than tangible products, they do not need a manufacturing base and many collaborators, and are in line with technology trends, lifestyles and the spirit of the times. The causes of business idea are trivial, e.g. something is missing or not working, some process is lengthy or inconvenient, but an imaginative entrepreneur sees more sophisticated content in some imperfection or deficiency e.g. lack of specific information or confusing

and disordered information. The conditions for creating an idea are mainly personal experience and sensitive observation of the surroundings, but is it enough for an original business idea? Often declared exceptional originality of the business idea is a fundamental problem of the researched start-ups. Unconfirmed assumptions, impressions, and various subjective arguments prevail, which cause later failure and disappointment. The notion of self-exceptionality is usually the consequence of insufficient knowledge of the idea, theme, industry and underestimation or disregard of real competition on a wider European and global scale. The key influence of quality business orientation on the sustainability of a start-up is also confirmed by the results of research by Voinea et al. (2019).

It takes too long to develop a business idea. Successful start-ups in the world will show their viability within three years from their establishment and then scale or exit. In almost five years of existence, the examined start-ups have reached the beginning of phase 4 of the business idea development (4.1: first revenues) and show no signs of exponential growth. In the funding cycle, they arrived between phases 2 and 3 (2.6: between start-up capital and initial and development capital). There is a clear difference in the progress of business development and investment cycle. The founders lack big money of several million euros and investors do not trust the underdeveloped product, which is not confirmed by market interest.

Business model
The customer value proposition is situated in the middle of the chain: missing human, material and information resource (need) → simplification, facilitation of processes and communication needed to procure resources that were previously complex and labour intensive (value) → application (MVP). Satisfied needs are not revolutionary, respectively they are no revealing blue oceans, values are usually to simplify and facilitate access to information or a tangible product, while minimum viable product is at European level, which paradoxically surpasses the relative routine of satisfied needs and values offered.

Customer segments are represented by demanding customers at European level, although paradoxically start-ups are more orientated to the domestic market, which is very small (5.5 million inhabitants), business customers (B2B) dominate significantly on the served segments and start-ups have little bargaining power toward them. Eventually, start-ups serve one or a few segments, what is corresponding to their capabilities.

Customer relations are dominated by personal assistance, which is very demanding on human resources. However, start-up has paradoxically a very limited amount of staff.

Distribution channels are realized through their own website, personal contacts and relationships, but they are laborious and costly. Start-ups have aversion to intermediaries and therefore carry out direct export. Again, paradoxically, start-uppers want to sell almost everything themselves and without foreign help.

Key resources are also marked by a paradox when the founder has an idea, but he cannot develop it without experts and specialists because they are expensive, very rare and difficult to imitate/substitute. Financial resources lack, but there is absence of bootstraping, and paradoxically, an idea/product that is declared as a world original does not attract investors and their money.

Paradoxically, key processes do not include advanced customer service processes, although start-ups are in phase 4 of the business cycle (first revenues). The lagging behind in the development of not only this block of business model is probably a characteristic feature of start-ups.

Key partners are limited only to cooperation in distribution (dealers) and procurement of money (investors). Half of the start-ups have no partners, with existing partners having a higher than lower quality (3.6) and paradoxically a lower than higher level of development (60.7%).

Costs and their indicators are around the middle, hence costs in relation to the final prices of production, prices of relevant competitors and the ratio between fixed and variable costs. It is a manifestation of caution, risk aversion and a tendency towards mediocrity, which is a paradox of the notion about excellence and innovativeness of start-up. The research of Hudáková et al. (2019) also draws attention to the irreplaceable role of partners in the sustainable development of start-ups.

Revenue flows are insufficient due to start-up age. Start-ups have few users, even fewer customers, and revenues do not cover costs. The average start-up is at a loss and has a thin gross margin. Monetization imitate common practice, no compelling innovations can be seen. Again, there is a paradox when a relatively high quality and developed value offer is not transformed into revenues.

The summary assessment of the units reveals several paradoxes between the quality and the degree of development of some units:
- partners and cost structure are more quality blocks but less developed,
- processes, customer relationships and distribution are of lower quality but more developed, but the differences are small,
- the value offered and customers are highly prominent, distribution, customer relations (quality), partners and costs (degree of development) are insufficient, therefore implementation and sales are lagging behind and revenue flows are consequently lagging behind.

Start-ups are not fast enough in their development. They are weakened by the lack of progress due to the lack of financial and human resources. Their success depends on winning a new customer and their failure is caused the lack of high-quality, highly professional human resources, stagnant teamwork and lack of big money. Start-ups pivot less than necessary. However, the experimental nature of start-up requires this. Concentrating on one idea without major changes over a longer period is also one of the reasons for lengthy growth and failure.

Relations/correlations
Among the business model blocks that are measured by quality degree (Table 4), there is a relatively broad occurrence of strong correlation, but the dominant block of correlation table 4 and evaluating table 3, which is the customer value proposition/product, has paradoxically negligible impact on the final performance (Table 7, 8, 9). Key business partners and cost structure dominate among the business model blocks which are measured by the degree of development (Table 5), but again their impact on performance (Table 7, 8, 9) is insignificant. Paradoxically, strong relationships of an individual block do not result in an individual significant impact on performance, or they do not succeed to convert into a contribution to the performance. However, the business model is quite consistent overall and this is reflected in its overall impact on start-up performance (Table 9).

The strong correlation of key partners appears to be a manifestation of the need for partnership/external cooperation across all blocks of business model. It is a confirmation of the necessity of partnership, although start-ups do not like to admit it. They want to maintain independence, but which is an obstacle to acceleration, scaling and exponential growth. The confirmation of an effort for an independence is also the lower level of development of partners (60.7%).

Relations/regressions
The impact of start-up development measured by business idea development, investment and territorial expansion has been demonstrated (Table 6). This impact was expected and is in line with the logic of building a company. Noteworthy is the statistically insignificant impact of the team founder's age, originality of the idea, and the degree of product differentiation, since the founder's age (Garaj, 2015) is considered an important investment criterion and originality and differentiation are considered essential sources of competitive advantage.

There is an apparent difference between the impact of block quality and the impact of block development on start-up performance (Tables 7, 8). Block development, its completion is more efficient than block quality. The quality impact is obviously determined by the block implementation and not vice versa. However, influential blocks (there are fewer) of a qualitatively measured model have a greater effect on performance than influential blocks (there are more) of a model measured by the degree of development. What, then, is a driver of performance? The only conclusion is that the model has some impact on the performance measured by the number of users and the number of customers, and does not have a statistically significant impact on revenues. The discrepancy between the impact of the model on non-financial (number of users and customers) and financial (sales) indicators of performance is evident. The weak conversion of users and customers to revenue is also likely to be affected by an unfinished model and other factors, e.g. pricing, founder experience, market size, money for development.

It can be assumed that multiple correlation expresses the model's impact on performance more realistic than simple correlation, because the model practically operates as an aggregate of cooperating blocks and not as a collection of individually and independently functioning blocks. On the other hand, the influence of the individual blocks may not excel. The development-measured model explains more (R Square) the impact on start-up performance than the quality-measured model, but the contributions of its blocks (B coefficients) are less than those of the quality-measured model blocks. The higher functionality (higher degree of development) of the model contributes slightly more to the performance than its overall higher quality. Meanwhile, a more functional model has a slightly greater impact on performance than a more quality model.

The goals of the research were met and the acquired knowledge contributes to the improvement of knowledge about the personnel background of the startup, the origin of the business idea, the structure of the business model and its impact on business performance. Perhaps the main and summarizing knowledge is that start-ups are imperfect companies with an exclusive and at the same time limited exceptionality, which they must supplement with complementary assets.

6. Conclusion

The start-ups under investigation are slow in their development and do not succeed to monetize the results of their efforts. Given their very limited own resources, they have little partnerships, whereby they have an aversion to some kinds of external cooperation, which they inevitably have to reveal its inside. Even though start-ups come with innovations, they are conservative at the same time because they make small number of pivots. They do not want to change their business concept often and significantly, although it does not bring the expected results. They are full of different paradoxes that are the consequence of their smallness. The business model is not innovative, the level of blocks is unbalanced and is reflected in underperformance. Start-ups concentrate on the block of customer value proposition, both qualitative and developmental lagging of other blocks is obvious and that is why the business model has little impact on performance. Improving the model to a fully functional state has a slightly greater effect on performance than improving the quality of its individual blocks.

A number of factors that negatively affect the development, performance and sustainability of start-up can only be eliminated by partnering, since start-ups are naturally extremely limited in their resources. This is a difficult decision, however, because it means to make know-how accessible to partners or share control of the company and lose the independent and exclusive position of the founder. Weakening the key person's motivation will greatly affect the viability of the start-up.

The limitation of the research was the size of the research sample, which was given by the low helpfulness of the start-uppers. However, the size of the research sample enabled to do the pilot qualitative research and basic statistical analysis. Limited number of the studied bodies had been balanced by in-depth qualitative insight which

can be enlarged in the next studies. The industry diversity of start-ups can also be a questionable limitation of research, but it is extremely difficult to compile a homogeneous sample.

Further research on start-ups, which would continue in topic to improve and increase their business sustainability, should focus on partnership (types, relationships, consequences), scaling (transition to scale-up) and innovation in monetization (use of platforms and shared economy).

Appendix 1 List of studied start-ups

Addwork - IT application, video job descriptions
Beesafe - IT application, personal security
eDocu - IT application, concentrated data about an object
elearn.aero - special education
GA Drilling - technology, deep earth drilling
Greenway - technology, e-mobility
Challengest - IT application, industrial production
iBed Pro - technology, special furniture
JobAngels - IT application, admin support
KickResume - IT application, compiling an attractive CV
Luigi´s Box - IT application, search engine for e-commerce
Mapilary - IT application, tracking the distribution of goods at the last mile
Matsuko - IT application, human face identification
Microveg - technology, production and distribution of microherbs
Muvity - IT application, search for real estate agents
Octago - exercise equipment
Orderlord - IT application, ordering and food delivery
Quake resQ - technology, fast earthquake warning
Revolware - special consultancy for startuppers
RVMagnetics - technology, sensors
share.vi - technology, e-lock
Sli.do - IT application, feedback for public presentation
SkillsMill - personnel services, temporary insourcing specialists
Speekle - IT application, speech correction
Staffino - IT application, feedback on the quality of services and staff
Storyous - IT application, online cash register systems
Sufio - IT application, automatic invoices for online stores
3DRepo - technology, IT application, displaying large construction projects in 3D
Venzeo - admin support, photographic evidence of workflow or completed work
Green Mail - non-traditional postal services

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Štefan SLÁVIK is the Professor of Business Management at Department of Management, University of Economics in Bratislava, Slovakia. He has long been involved in the research of business models and start-ups. Research interests: strategic management, management of change, business models, start-ups and entrepreneurship.
ORCID ID: https://orcid.org/0000-0002-2890-8091

Richard BEDNÁR is the Assistant Professor at Department of Management, University of Economics in Bratislava, Slovakia. He has long been involved in the research of business models and start-ups. Research interests: international management and business, general management, business models, start-ups and entrepreneurship.
ORCID ID: https://orcid.org/0000-0001-5282-6507

Ivana Mišúnová HUDÁKOVÁ is the Associate Professor at Department of Management, University of Economics in Bratislava, Slovakia. She has long been involved in the research of business models and start-ups. Research interests: strategic management, general management, business models and start-ups.
ORCID ID: https://orcid.org/0000-0001-8417-9762

Branislav ZAGORŠEK is the Assistant Professor at Department of Management, University of Economics in Bratislava, Slovakia. He has long been involved in the research of business models and start-ups. Research interests: business planning, general management, business models and entrepreneurship.
ORCID ID: https://orcid.org/0000-0003-3474-9442

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GIVE OR BUY CONTEXTS AND INTERNET EXPERIENCE AS A FACTOR DIFFERENTIATING OF READINESS TO PROVIDE DIFFERENT TYPES OF PERSONAL DATA IN M-COMMERCE

Jacek Woźniak [1], Alexandra Zbuchea [2]

[1] *University of Economics and Human Sciences, Ul. Okopowa 59., 01-043 Warsaw, Poland*
[2] *National University of Political Studies and Public Administration, 30 A Expozitiei Blvd. Sector 1, 012104 Bucharest, Romania*

E-mails: [1]j.wozniak@vizja.pl; [2] alexandra.zbuchea@facultateademanagement.ro

Abstract. Studies show that privacy concerns are an important factor in m-commerce and m-buyers are often not ready to disclose private data to m-shops. An e-questionnaire survey was used to gather opinions in three groups – ca. 160 Poles, ca.160 Ukrainians and ca.130 Romanians, to study decisions of potential consumers concerning disclosure of personal data when downloading paid or free mobile applications in 3 different contexts: downloading an attractive app to their smartphone as a gift, as a promo purchase, or from a well-known brand. The study showed that different kinds of personal data have different fragility levels. The e-mail had the lowest level of concern, postal address a medium level, and ID and credit card numbers the highest. Context was also shown to change the kind of data respondents are willing to exchange for an attractive app. When the measure of internet experience was subjective to the length of internet use, people with higher internet experience were not found to be more unlikely to download an attractive app to their smartphone, if a condition of downloading it was providing personal identification data, in comparison with persons with low internet experience. When internet experience was measured by social norms (living in a country with a higher e-readiness index), persons with higher experience levels were less likely to download apps requiring the provision of personal data. The text ends with recommendations and suggestions for further research.

Keywords: m-commerce; m-application download; privacy; m-commerce in Eastern Europe.

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JEL Classifications: M31, M21, O31, O33, O57

1. Introduction

M-commerce is understood as a form of e-shopping (a set of activities carried out in the entire purchasing cycle, namely from gathering purchase information, through closing online transactions, to post-purchase behaviors) carried out through mobile telecommunication (usually smartphones) (Koh et al. 2009; Wong et al. 2012; Groß 2016). This type of shopping is still a new phenomenon, but the dynamics of its development and the expectations that are associated with it attract a lively interest, both in practice and research. Furthermore, research on trust-

related barriers in m-commerce (Hew 2017) is also being widely conducted, which stems, in particular, from the partial differences in the conditions of trust in this type of e-commerce (Groß 2016; Javaria et al., 2020) and the need for separate analyses for different markets, as they are characterized by different m-purchasing patterns (Cyr 2008; Zhang et al. 2012; Akman & Rehan 2016).

Trust in e-commerce is mainly considered in the context of purchasing security (i.e. implementing procedures to secure the transfer of information) and privacy protection (i.e. not using the buyer's data for any other purpose than that agreed with the buyer). The main theoretical models that formed the basis for those studies were based on rational choice models (Ajzen 1991) either in the form of theories referring to the technology acceptance model (TAM) (Davis 1989) and its extensions (Venkatesh & Bala 2008; Venkatesh et al. 2012; Dwivedi et al. 2019), or the diffusion innovation theory (DIT) (Rogers 1995), or finally - the theory of perceived risk (Bauer 1960; Groß 2016). Trust is an essential factor in m-commerce and it has been considered in many studies (Mondego & Gide 2018).

However, recently, indications have emerged that this approach may not be sufficient to test m-commerce trust. An experimental study demonstrated that when providing in exchange for a $20 coupon gift, the respondents followed their emotional assessment concerning the supplier rather than the rational decision-making model (Roghanizad & Neufeld 2015). Likewise rating a well-known brand supplier rather than the risks associated with the purchase can explain the widespread popularity of smartphone payments for coffee in Starbucks without the feeling of threatened privacy (Hillman & Neustaedter 2017).

These unexpected results need to be verified using samples from other countries and the analyses need to be extended to include a wider range of contextual factors that determine a smartphone user's decision because, in e-commerce, the willingness to disclose information about oneself is different for different contexts (Bandara et al., 2019; Bansal, Zahedi, & Gefen, 2016; Gupta et al., 2010). The current study is a step in that direction. Based on an e-questionnaire conducted in three groups in different age ranges which included 167 Polish, 166 Ukrainian and 126 Romanian participants, selected factors influencing the decisions of potential consumers to make their personal data available in a situation specific to e-commerce, namely, downloading a free or paid mobile application, were analyzed. The study adds to the current body of literature also by covering a geographical area uncharted yet. Most of the investigations on trust in m-commerce are developed in China and Spain (Mondego & Gide 2018).

The study is structured as follows. Part 2 explores the issue of downloading a mobile application in m-commerce. Part 3 contains the methodology and hypotheses of the researchers, and 4 - a discussion of the results. The current study ends with a summary presenting the main conclusions and practical recommendations. The first results of this study, based on smaller samples and without statistical analysis, were published as a conference paper (Woźniak & Zbuchea 2018). Some phrases can be similar for both texts, especially in the section describing the methodology.

2. Downloading a mobile application as a sample activity in m-commerce shopping

There are three different ways of defining m-commerce in the literature, which emphasize the different business opportunities arising from the constant presence of the smartphone with the user. The first refers to making commercial transactions using mobile devices (Koh et al. 2009; Wong et al, 2012), and thus concerns m-commerce as a part of e-commerce, determined by a specific type of hardware. The second - to new business models that result from the possibility of creating services based on user location (Cliquet et al., 2014; Khare & Rakesh, 2012). The third group of definitions, which is the most relevant for the current study, highlights the fact that the smartphone becomes a personalized communication point, which is permanently connected to the individual (Groß 2016). Emphasizing the customization of smartphones is characteristic of this group of

definitions. It can be done by downloading mobile applications, whether they create the main access channel to the m-store or are attractive features themselves (e.g. ringtones), or enable the user to carry out additional activities that are beneficial to the (e.g. looking up a bus schedule). From the perspective of our study, it is important that a significant part of programs which provide ease of use for the smartphone owner can be downloaded free of charge from the web and users are aware that often the fee for the convenience of having this application is providing access to user personal data.

In m-business, user data – with specific purchase history and physical location – creates a business opportunity that can be evaluated and traded. The more information about the user is obtained by the m-supplier, the higher the adjustment of the services offered to their needs. At the same time, interference with their privacy is broadened. This tension – between the benefits and risks to the user resulting from the disclosure of some of the information about them – is sometimes called the personalization-privacy paradox (Lee & Rha 2016) and it is indicated that different categories of users adopt different strategies in these situations depending, in particular, on the perception of risks in the specific situation. Perceived risks are numerous (financial, psychological, physical, time, performance, social, privacy, and security), and previous research shows that they are more prominent in m-commerce than in e-commerce (Marriott, Williams & Dwivedi 2017). Studies suggest that consumers are increasingly more concerned with privacy issues related to online shopping (Bardara, Fernando & Akter 2020).

Previous studies have shown that trust is a factor that reduces the sense of risk in particular m-marketing situations (Lee & Rha 2016). Standard ways to increase trust in e-commerce of potential users include the use of indices informing the user about the reliability of the e-shop, which can be divided into hard indices (e.g. encryption), which present the security of transactions, and soft indices (e.g. opinions of others about the quality of transactions or a well-known brand), which inform about confidentiality (Head & Hassanein 2002; Hillman & Neustaedter 2017). Security in m-transactions is understood as the protection of information transmitted during interaction against interception by a third party. This threat is greater in m-commerce than in e-commerce (due to lack of control of the physical environment in which the user is located) (Groß 2016). Privacy risks relate to concerns about the user's control over their data when it is collected, stored and shared with others, not only during but also after the transaction (Groß 2016). Understandably, both factors pose important barriers that may prevent e- and m-users from implementing (respectively) e- and m-transactions. Although trust is an important variable, it is not the only relevant one. Predictors of behavior in various m-marketing contexts might also be performance expectancy, effort expectancy, hedonic motivation, price value (Alalwan, Dwivedi & Rana 2017), usefulness and ease of use (Abu-Shanab & Ghaleb 2012).

Recently, two studies have been carried out, the results of which suggest that the conditions for a user's sense of privacy risk in m-commerce may be partially different from those in e-commerce. The first study showed that for m-buyers in the US, concerns about privacy risks are low when they make mobile transactions with well-known brands, such as paying for coffee in Starbucks via contactless payment (Hillman & Neustaedter 2017). The study was conducted using qualitative methods, therefore it did not pose questions related to the characteristics of these consumers, and in particular to the situational and cultural specificity.

The second study concerned directly with readiness to disclose private data and was experimental. A low sense of privacy risk that results in high readiness to disclose private data is usually explained through trust in the e-shop, which restricts perceived risk of the negative consequences of one's activity, namely, one of the two factors that determine a decision based on rational assessment (the other being perceived benefits) according to the Theory of Perceived Risk (Bauer, 1960; Groß, 2016). One experimental study, where different types of data were to be provided in return for a 20$ coupon gift, revealed the limits of this approach—subjects were shown to depend on their emotional evaluation of the seller, rather than to follow a rational model of decision-making (Roghanizad & Neufeld, 2015).

Both of these studies concern the specific context in which the m-transaction takes place, as they are not based on a general perception of trade. The first considers the contact with a well-known brand and the second concerns the exchange of gifts. Hence, the goal of our study is to check if these specific contexts can be a factor that leads to unusual behavior of m-buyers, and thus in particular whether communication with a well-known brand or the exchange of gifts are factors responsible for readiness to reveal personal data (a possible interpretation of the contexts in these situations). As Marcel Mauss (1925/1990) has stated, the situation in which gifts are exchanged creates a different set of attitudes than the context of buying and selling—it favors an attitude of reciprocating favors rather than maximizing benefits for oneself in the transaction.

It has already been observed that the willingness to disclose information about oneself in a situation of a broadly understood e-purchase is a feature that depends not only on the specificity of an entity, but also on the context in which this information is disclosed (Bansal, Zahedi, & Gefen 2016). A social situation in which numerous people pay using smartphones can - according to the perception of social norms (Venkatesh & Bala 2008; Venkatesh et al. 2012) - encourage unconscious perception of this activity as safe. Company brand – as respondents declare in response to direct questions – may be another way in which trust is built (Hillman & Neustaedter 2017). In this sense, for the hypothesis presented above on the different determinants of the sense of privacy threat due to revealing personal data during purchases via smartphone, it is worth considering not only the wider contexts in which the m-transaction takes place but also those in which the social pressure resulting from the presence of others conducting transactions in a certain way is lower than in situations where nearly everyone pays for coffee using their smartphones.

Apart from the analysis of specific situational contexts, which can be different, the additional scientific knowledge brought by the current study concerns the specificity of the m-market in question. Several previous analyses have shown that the development of m-commerce in different countries follows different trajectories (Zhang, Zhung & Liu 2012; Akman & Rehan 2016; Chehabeddine, Tvaronavičienė, 2020). In particular, clear distinctions were identified in terms of factors conducive to the adaptation of m-commerce (m-user readiness to enter m-transaction) between countries classified as Western and Eastern cultures, although due to the specificities of the available data, these findings were made for markets which are quite advanced in the use of m-commerce (Zhang, Zhung & Liu 2012) and did not cover post-socialist countries for which there is little research (Zbuchea, Vătămănescu & Pînzaru 2015; Woźniak 2017; Woźniak & Zbuchea 2018); in particular – studies comparing data from Poland, Romania, and Ukraine. Analyses of the factors characterizing the willingness to disclose personal data from these 3 countries complement m-commerce research that focuses on samples from m-markets, such as the highly developed West and South-East Asia (with Korea and Japan) (Natarajan, Balasubramanian & Kasilingam 2017; Gupta & Arora 2017).

Poland, Ukraine, and Romania are the three countries that – although culturally similar to each other – are reforming at different rates after the fall of the Soviet Union. All three, despite being medium developed countries, belong to undeveloped e-commerce markets. The institutional, legal and technical infrastructure for e-trade is, however, slightly better in Poland than in the other two countries, evidence of which are aggregated indices such as e-readiness, which in 2015 in Poland was higher by over 10%—this gave Poland 42nd place in world rankings. Ukraine took 64th place (upgraded from 75th place in 2012), and Romania 66th.

A slightly different view emerges from a comparison based only on access to ICT infrastructure. The ITU ICT Development Index (IDI), measured by International Telecommunication Union, combines 11 indicators on ICT access (40% weight), use (40% weight) and skills (20% weight, measured by the number of years of education, percentage of secondary and tertiary education), capturing key aspects of ICT development for inclusive

information societies. In 2017 ranking Poland occupied 49th place (with score 6.89), Romania - 58th (with score 6.48), and the Ukraine - 79th (5.62), among 192 economies worldwide (ITU 2017: 31).

E-markets in these countries have different sizes. The total value of e-trade turnover in 2017 was 6.671 billion Euros in Poland, and 1.17 billion Euros in Ukraine and 2.80 billion Euro for Romania (EuroCommerce, 2018). It should be remembered, however, that GDP per capita is far lower in Ukraine (c. 2,564 Euros per capita in 2019) than in Romania (c.9,928 Euro in 2019) or in Poland (c.13,165 euro), as well as the population (c. 38 mln for Poland, 44 mln in Ukraine and 19 mln in Romania) and internet penetration (77%, 67%, 74% respectively in 2019) (EuroCommerce 2019).

All 3 e-markets have grown rapidly from 2017 to 2018. In 2018, the e-commerce industry of Romania was worth 3.6 billion euros and the average spending per online shopper was estimated at 786 euros (based on 2015 data), according to the Ecommerce Foundation. (https://ecommercenews.eu/ecommerce-in-europe/ecommerce-romania/). Online sales on Ukraine €1.86 billion (2018) with only 3.7 million of these internet users shop online and on average, online shoppers in Ukraine spend 286 euros per year (https://ecommercenews.eu/ecommerce-in-europe/ecommerce-in-ukraine/) For Romania, the Turnover growth of e-commerce was of 30% in 2019; while for Poland was of 5%, and the figure for Ukraine was 15% (EuroCommerce 2019).

In 2018 in Poland, over 61 percent of the online population shop online and spend an average of 651.50 euros per year and total e-spending reached 9.31 billion euro in 2018. (https://ecommercenews.eu/ecommerce-in-poland-to-reach-e11-64-billion-in-2019/). The data suggests that the experience in e- and m- shopping is extensive in the surveyed countries, although more experience is to be expected in relation to the problems that arise in m-shopping - and therefore the awareness of privacy risks - in Poland than in other countries. Data on the scale of infrastructure availability (for which the ITU ICT Development Index may be an indicator) suggests that differences between Ukraine and Romania may also be expected.

3. **Methodology of research**

The current study aimed to check whether, in the situation presented as an exchange of gifts, smartphone users will be inclined to provide information about their private data more often than in the situation presented as a purchase at a favorable price. Also, the study's goal was to check whether there is a difference in this readiness when a purchase is made from a well-known brand than when a purchase is made in an unspecified situation, described as an online site. An additional goal of the study is to verify whether internet experience is a modifier of the strength of barriers to trust in m-commerce.

We will focus on the exchange of apps which develop the smartphone's functions as a personal center for management, communication, and entertainment, and which are free. As has been shown, this segment of the m-market is based on creating a potential client of the user of the given application, and so income from providing the user with the app does not dominate in the sellers' business model. Users, however, are accustomed to the fact that obtaining an attractive application sometimes goes in pair with providing personal data, hence this situation is a good one for analyzing readiness to expose oneself to a threat to one's privacy in exchange for obtaining a gift with an attractive value.

It is understandable that several contextual conditions, such as the value of the sum in question, or - the negative consequences that a breach of trust may bring the buyer, modifies readiness to engage in commercial transactions. Readiness to disclose personal information should, therefore, depend on the sensitivity level of this information (Roghanizad & Neufeld 2015), consistently with the Theory of Perceived Risk (Groß 2016). The research

questions concern the extent to which broad contexts (defined as the exchange of gifts or a purchase) and situational contexts (defined as obtaining an application from a company with a well-known brand) as well as internet experiences, modify this readiness to provide personal data of various kinds.

Referencing the Theory of Perceived Risk (Groß 2016), it is expected that different types of information will be treated by the respondents as having different levels of sensitivity. It can be expected that data concerning e-mail or traditional mail addresses, which are generally widely available and the knowledge of which does not usually lead to material losses, will be considered insensitive.

A higher level of sensitivity can be attributed to data related to personal documents, such as the ID number. Although these types of data do not directly lead to financial losses, the request for such data may be treated by online users as unduly invasive of their privacy, not so much because of the Theory of Perceived Risk (Groß 2016), but because of the atypical nature of the request, namely, the lack of compliance with social norms prevailing in a given environment, according to factors indicated by the extended versions of the TAM model (Venkatesh & Bala 2008; Venkatesh et al. 2012), influence the intention to use the new technology. Extended versions of TAM emphasize that, apart from perceived ease of use and perceived benefits, compliance with a social norm is the third factor determining the intention of use, so in our case - readiness to complete a certain m-action online.

The third group of information is made up of data whose sensitivity results directly from the risk of financial losses that may result from their provision, in particular - the bank account number. Based on this argumentation and in accordance with the findings of previous studies, in particular (Roghanizad & Neufeld 2015),
Hypothesis 1 is formulated.
H1. The readiness to provide personal data varies for different types of data

As indicated above, according to Mauss, the level of willingness to disclose data in a situation defined as a gift exchange may be higher than in a situation defined as a purchase situation, even at an attractive (discount) price. Transactions with a well-known brand company can be seen as a situation in which the buyer benefits not only from the purchase of goods but also from the prestige of the brand. Therefore, transactions in such a situation can be treated as pursuing two objectives - the exchange of gifts and purchase of a product. This way of thinking suggests that in transactions with a well-known brand company there will be a higher willingness to provide private data than in a simple purchase, which makes it partly similar to exchanging gifts.
H2. The frequency of providing personal data for a specific kind of information is higher if the situation is defined as an exchange of gifts, than if it is defined as an advantageous purchase with a discount.

It should be noted that Mauss's theory concerns natural (personal contact), not online interactions. This means that the condition for the impact of these different expectations is that the situation is not manipulated by the other party. Knowledge of the Internet and the dangers associated with the control Internet situations should be higher for people with more online experience. Therefore, it should be expected that people with more online experience, whether measured at the level of an individual or at the level of a country (i.e. people from a country with a higher level of Internet infrastructure) will be more aware of the scale of risks that characterize Internet interactions, and thus will be less affected by the influence of the definition of a situation as a gift.
H.3. The internet experience, measured on individual and country-level will modify the readiness to provide personal data for a specific kind of information, and higher experience leads to a lower frequency of providing personal data for a specific kind of information.

The data for our study were collected as 3 independent samples, gathered using the snowball method by the authors' MA students in university year 2017/2018. Respondents generally have higher education (or were in college at the time) and lived in large cities (mainly Warsaw, Odessa, or Bucharest) and can be seen as representatives of 'early adopters' of new technologies and products. This slightly vague term refers to the fact that in every society some social groups tend to try out new solutions, especially of the technological kind, and it is with them that the dissemination of the technology starts (Rogers 1962). The typical socio-demographical characteristic of early adopters is similar to our respondents' as they usually are young professionals from big cities. The study base on a group of 167 Poles, 166 Ukrainians, and 126 Romanians, demographically differentiated.

As the investigation aims is to verify if internet experience, variously defined, significantly modifies readiness to provide personal data in 3 contexts: defining the situation as a gift or purchase or transaction with a well-known brand, the questionnaire constructed for the study – besides a series of questions concerning the previously made e- and m-purchases – consisted of 3 groups of questions on readiness to submit different kinds of personal data assessed on 7 points Likert scale. The 3 situations were characterized as the first an exchange of gifts, the second a purchase with a discount and the third - well-known brand context. Each question consists of 6 items:

   a.   I will give my e-mail address to get the attractive app [and the context: for free, to buy on discount price]
   b.   I will give my full internet data - e-mail address and telephone number - [and the context: to get for free, to buy on discount price]
   c.   I will give my post and e-mail address [and the context: to get for free, to buy on discount price]
   d.   I will give my credit card number and e-mail address [and the context: to get for free, to buy on discount price]
   e.   I will give my credit card number and full addresses data (with my ID number) [and the context: to get for free, to buy on discount price]
   f.   I will withdraw from getting the attractive app if it is necessary to submit any of my personal data

(a) contains the least sensitive data (e-mail), (b) and (c) medium-sensitivity data, (d) and (e) high-sensitivity sensitivity data, and (f) a declaration to withdraw from contact if any data is needed – and is, therefore, a negative measure of readiness to provide any data, regardless of the type.

The study used several kinds of internet experience indices, but this text refers to two operationalizations:

•   Respondents were classified into two groups, based on subjective declaration: as internet experienced if they responded "have used the internet for a long time", and as less internet experienced – if they responded that they "have used the internet for a long time, but really frequently not for long"; "I use the internet, but not very frequently"; or "I use the internet if I need to, but I don't feel too comfortable with it".

•   Representing a country with higher levels of technical and social ICT infrastructure was based on the networked readiness index http://reports.weforum.org/global-information-technology-report-2016/networked-readiness-index/. Poland takes 42ndplace in world rankings, Ukraine – 64th, Romania – 66th, so we can assume that the internet experience of people is higher in Poland and similar in the Ukraine and Romania (See Woźniak, 2015, for an explanation of the construction of the index).

3. Research results and discussion

To verify Hypotheses 1 and 2, the Wilcoxon test was used to check that the differences in ranks for the same personal data between the question about the gift-exchange situation (Using a smartphone to download an app which you find attractive) differ significantly from the frequency of the purchase situation (Using a smartphone to

download an app, which you find attractive and not expensive I will submit some of my data) for further types of data.

Table 1. Differences in the willingness to provide a specific type of information about personal data in a situation defined as an exchange of gifts and a situation defined as an 'ordinary' site

Compared questions	statistical measurements			mean ratings concerning data-sharing readiness	
	Z	p	R	when the app is free	when the app is purchased
I will give my e-mail address to get the attractive app for free/ **I will give my e-mail address, if it is the condition to buy the app**	-3.465b	0.001	0.161	3.15	3.47
I will give my full internet data - e-mail address and telephone number - to get app for free/ **[I will give e-mail address and telephone number - if it is the condition to buy the app]**	-6.820c	0.000	0.318	3.96	3.52
I will give my post and e-mail address to get app for free [...**- if it is the condition to buy the app]**	-6.349c	0.000	0.296	4.24	3.85
I will give my credit card number and e-mail address to get app for free [...**- if it is the condition to buy the app]**	-1.694b	0.090	Nd	Nd	nd
I will give my credit card number and full addresses data (with my ID number) to get app for free [...**- if it is the condition to buy the app]**	-1.459c	0.144	Nd	Nd	nd
I will withdraw from getting the attractive app, if there it is necessary to submit any of my personal data [...**- if it is the condition to buy the app]**	-3.187c	0.001	0.149	4.03	3.70

Source: data from research

b on the basis of positive ranks
c on the basis of negative ranks
nd - in the absence of an established relationship, the measure was not counted

The data in the table shows that low-sensitivity data is context-dependent and high-sensitivity information is not. Looking at the means, we conclude that Hypothesis 1 is confirmed only for data with the lowest sensitivity (e-mail address) (the lesser the Likert scale value, the stronger the result, therefore in Table 1 the smaller the number the stronger the willingness to provide data for a-e, but the stronger the willingness to abandon the transaction for f).

For medium-sensitivity data, the data in table 1 confirm the opposite hypothesis, namely that in a purchase situation, respondents would be more willing to provide medium-sensitivity data, and would more often withdraw from the transaction if some data had to be provided than in a "gift exchange" situation. Such an outcome can be explained by referring to the social standards governing the defined situation – when exchanging gifts, the basis for the exchange is the free decision of the parties and not a claim of the other party to specific data, while the provision of certain insensitive data in a purchasing situation is normal practice in online shopping. This interpretation suggests that the extended version of TAM better than Mauss's face-to-face model of free exchange of gifts explains the highly routinized situation of some types of online contact.

Highly sensitive data, namely, those containing a credit card number are treated differently by the respondents and the data collected in Table 1 show that there are no significant differences in their availability, regardless of the contextual definition of the situation. This means that at the risk of a large loss (or highly unusual demands compared to market standards) the difference between the context defined as a gift and a purchase disappears in the eyes of respondents.

Table 2. Differences in willingness to provide a specific type of information about personal data in a situation defined as an exchange of gifts and a situation defined as a purchase, broken down by respondents from Poland or Romania and Ukraine together ("ordinary" website, situation not defined)

Compared questions	statistical measurements			mean ratings concerning data-sharing readiness	
	Z	p	R	when the app is free (a shop)	when the app is purchased
I will give my e-mail address to get the attractive app for free/ **I will give my e-mail address, if it is the condition to buy the app**	-3.465b	0,001	0,162	3,15	3,13
I will give my full internet data - e-mail address and telephone number - to get app for free/ **[I will give e-mail address and telephone number - if it is the condition to buy the app]**	-6.820c	0,000	0,319	3,96	3,53
I will give my post and e-mail address to get app for free **[…- if it is the condition to buy the app]**	-6.349c	0,000	0,297	4,24	3,84
I will give my credit card number and e-mail address to get app for free [...**- if it is the condition to buy the app]**	-1.694b	0,090	0,080	4,78	4,75
I will give my credit card number and full addresses data (with my ID number) to get app for free [...**- if it is the condition to buy the app]**	-1.459c	0,144	0,068	5,11	4,84
I will withdraw from getting the attractive app, if there it is necessary to submit any of my personal data [...**- if it is the condition to buy the app]**	-3.187c	0,001	0,150	4,03	3,62

Source: data from research

b on the basis of positive ranks
c on the basis of negative ranks
nd - in the absence of an established relationship, the measure was not counted

To verify Hypothesis 3, two operationalizations of online experience were analyzed - belonging to a country with a higher level of e-readiness and subjectively declared ability of internet use. Table 2 shows that experience measured by country more (Poland) or less (Ukraine and Romania together) advanced makes a significant difference in providing low-sensitivity information between respondents from more and less experienced countries, as well as the willingness to give up transactions. As before, providing credit card data does not depend on such measured knowledge of the Internet and the risks it poses.

Online experience measured at the individual level (data not included in the text) turned out to be a statistically not significant factor differentiating the varied willingness to provide data in a situation of purchase and gift exchange (data omitted in the study), both in the entire group of respondents (i.e. 450 people), as well as in countries with a lower level of e-readiness (i.e. among respondents from Romania and Ukraine as one group). The Polish group only differentiated willingness to withdraw from the transaction when any data is required (item f - Wilcoxon test value-based on negative ranks z=-2.301, significance 0,021). This suggests that in the group of respondents with extensive internet experience, both personal and social, the "transparency" of the situation of contact with the company on the Internet is the highest, and regardless of its formulation, whether as a gift or as a purchase, it is understood that privacy is threatened by the provision of personal data. Considering this group as an indicator for the future development of Internet users' personal data behavior, it can be said that this result suggests a growing awareness of and low level of trust in the goals of online providers.

Table 3. Differences in the willingness to provide a specific type of personal data information in a situation defined as an exchange of gifts ("ordinary shop") and a situation defined as a purchase from a company with a well-known brand name.

Compared questions	statistical measurements			mean ratings concerning data-sharing readiness	
	Z	p	R	when the app is purchased from a well-known brand	when the app is given for free
I will give my e-mail address to get the attractive app for free/ **I will give my e-mail address, if it is the condition to buy from well-known brand]**	-.299[b]	0,765	Nd	3,13	3,15
I will give my full internet data - e-mail address and telephone number - to get app for free/ **[I will give e-mail address and telephone number - if it is the condition to buy the app from well-known brand]**	-7.100[c]	0,000	0,334	3,53	3,96
I will give my post and e-mail address to get app for free […**- if it is the condition to buy the app from well-known brand]**	-6.196[c]	0,000	0,291	3,84	4,24
I will give my credit card number and e-mail address to get app for free […**- if it is the condition to buy the app from well-known brand]**	-.619[b]	0,536	Nd	4,75	4,78
I will give my credit card number and full addresses data (with my ID number) to get app for free […**- if it is the condition to buy the app from well-known brand]**	-3.755[c]	0,000	0,176	4,84	5,11
I will withdraw from getting the attractive app, if there it is necessary to submit any of my personal data […**- if it is the condition to buy the app from well-known brand]**	-3.561[c]	0,000	0,167	3,62	4,03

Source: data from research

b on the basis of positive ranks
c on the basis of negative ranks
nd - in the absence of an established relationship, the measure was not counted

The results in Table 3 demonstrate that the situation of purchase in a well-known brand company is treated – in terms of willingness to provide personal data at the seller's request – differently from the situation of a gift exchange with an unspecified company (where the willingness to provide personal data was highest). Moreover, the differences consider not only to the willingness to provide low-sensitivity data such as e-mail and postal addresses but also to credit card information and ID number. Only data combining e-mail address and credit information data are similarly sensitive in both contexts. This result seems to confirm the data obtained in the U.S. Starbucks pay study - regardless of the social pressure that is likely to be exerted by the sight of other payers on the phone, respondents are more likely to provide high-sensitivity personal information (including credit card data) to companies with known macros than, even in their preferred situation, to companies with unknown brands.

To sum up, the data collected in the study allowed to partially confirm Hypotheses 1 and 2 for some personal data, and Hypothesis 3 for the Internet experience understood as belonging to a country with a higher level of e-readiness. However, it overturned the results for Internet experience measured according to declarations of extensive online experience.

Conclusions

The current study aimed to check whether, in a situation defined as a gift exchange, users will more likely to provide personal data information. The goal was also to verify whether a similar phenomenon in transactions with well-known brands occurs, and whether knowledge of the risks associated with making personal data available on the Internet, measured by the declared Internet experience and belonging to a country with a higher level of e-readiness (which measures the state of social, legal and technical infrastructure) modifies these relationships.

The study demonstrated that a higher willingness to disclose personal data in a gift exchange situation concerns only the lowest sensitivity data (e-mail address), while for medium sensitivity data (postal address and phone number) the opposite hypothesis was confirmed. No differences were reported in the willingness to provide data in each of the two contexts for the most sensitive data which may bear financial risks, for example - credit card information. It was also demonstrated that extensive online experience, measured by belonging to a country with a higher level of social and legal infrastructure, differentiates these two dependencies for low and medium-sensitive data, while there are no such differences for data with the highest sensitivity. Online experience, measured by individual declarations of the respondents, was only a factor when withdrawing from transactions if any personal data was required, and did not differentiate the decisions concerning the provision of specific categories of data.

This result indicates that the interpretation of the situation of downloading smartphone applications free of charge but in exchange for certain personal data as a gift exchange situation is very limited in scope, namely, it only adequately describes the exchange of applications for the least sensitive data (e-mail address), that is, with almost no risk for the user. Users often create separate e-mail addresses for e-commerce and m-commerce purposes, treating them as (almost) non-personal data, which would explain the willingness to provide them when "gifts" are exchanged. At the same time, the fact that greater awareness of the threats posed by providing personal data on the Internet (measured by the standards of a country with more experience in this area) differentiates the willingness to provide the least sensitive data (and to withdraw from a transaction when any data needs to be given) suggests that with increasing knowledge of the Internet, even a situation of gift exchange for less sensitive data will be treated by m-users as suspicious – it will not encourage them to give information about themselves. It is, therefore, to be expected that users will be increasingly sensitive to the protection of their personal data of all kinds, as their online experience grows.

The second research question concerned the specifics of transactions with well-known brands. The results confirmed that users are willing to provide their personal data more frequently when a transaction involves a well-known brand company, compared to a situation defined as an exchange of gifts with an unspecified company. The differences concerned medium and high sensitivity information, which confirmed previous findings regarding the willingness to make Starbucks payments using a smartphone. What it means, is that this tendency appears regardless of social norm pressure arising from looking at other people paying in this way (i.e. a known brand influences trust as an additional factor).

Both of these results allow the formulation of several practical recommendations. First of all, to obtain personal data for a company, it is effective for them to use one of their well-known brands, especially when the company wants to obtain very sensitive data. Offering "gifts" in exchange for personal data in the form of free smartphone applications can be an effective way to obtain only low-sensitivity data.

A second important practical consequence of the results of our study is the limited extent to which smartphone users will be willing to give out their personal data in exchange for free gadgets such as phone apps – with more online experience, users should be expected to be more sensitive to protecting their personal data.

From a scientific knowledge perspective, the study showed that the Theory of Perceived Risk explains the decisions of users in both studies, which became the starting point for the current study. The assessment of a company, or more precisely, the recognition of their brand as "well-known" changes the perception of risks in a transaction with such a company. Our results demonstrated that users are ready to provide a wide range of personal information when they enter into transactions with well-known brands, which suggests a different risk assessment in such a situation, rather than undermines the rational decision-making model. Confirmation of this suggestion, however, requires further research, aimed at a more accurate description of the user's decision-

making path, as our data is based on the declared results of the decision and not on the process of arriving at the said decision.

The second direction of future research, which is suggested by the results obtained here, concerns the measurement of knowledge about the risks involved in sharing personal data on the Internet. The two measures of this knowledge adopted here – the declared efficiency of using the Internet and living in a country with a certain level of socio-technical infrastructure indexed by e-readiness – are not precise, and are indirect indicators for a specific type of knowledge about threats. Basing this study on such distant indicators is one of the important limitations for the interpretation of the results obtained here. The need to search for good indicators for the levels of "general online culture" of the respondent is another direction of research suggested by the results obtained here. Direct declarations of online activity (through years of using a given tool, or a subjective declaration) – although attractive in terms of measurement, because the resulting measurement tool consists of one or two questions – are becoming increasingly unreliable, as they do not differentiate well between modern users. Alternative methodologies, which measure online familiarity on a scale of activity in the use of selected online tools, are not very well suited to the assessment of personal data risks and are cumbersome to measure due to the length of the questionnaire. From a methodological point of view, it is, therefore, necessary to continue to look for a short tool that reflects well the different levels of knowledge about the risks involved in making various types of data available online.

In conclusion, the study demonstrated that the mechanisms involved in providing personal data in m-transactions are more complicated than the TAM model with its additions and the Mauss model of personal gif exchange suggest. It has also been shown that transactions with well-known brands appear to be governed by separate rules from those with an unspecified website and that the online experience contributes to decreased readiness to provide certain types of personal data in both contexts. The underlying limitations for these conclusions, apart from the incidenality of the samples on which our study is based and the assumed operationalization of the indicators, are on self-reports of the undertaken behaviors (questionnaire responses), and not actual action in a situation of "temptation" to obtain an attractive application in exchange for entering some data. It can be expected that in a study inducing certain behavior (without exploring the intention), the tendency to provide personal data will turn out to be higher than that obtained in the current study. Confirmation of this suggestion requires further research, with a differently constructed methodology.

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Jacek WOŹNIAK is the Professor of Human Resource Management at University of Economics and Human Sciences, Warsaw, Poland. He is currently co- editing Zarządzanie Zasoabmi Ludzkimi (Polish journal for Human Resource Management). Research interests: human resource management, management in professional and knowledge based companies, ICT in HRM.
ORCID ID: https://orcid.org/0000-0003-4610-2822

Alexandra ZBUCHEA is associate professor at National University of Political Studies and Public Administration - Faculty of Management, Bucharest, Romania. She is currently co-Editor-in-Chief of Management Dynamics in the Knowledge Economy. Research interests: m-commerce, marketing for museums and non-profit organizations, knowledge management.
ORCID ID: https://orcid.org/0000-0002-5341-7622

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THE IMPACT OF ECONOMIC INTERESTS ON ECO-CONSUMPTION: THE CASE OF THE RUSSIAN ARCTIC ZONE OF KARELIA[*]

Valentina Karginova-Gubinova [1*], Alexander Volkov [2], Sergey Tishkov [3], Anton Shcherbak [4]

[1,2,3,4] Institute of Economics, Karelian Research Centre, Russian Academy of Science, A. Nevsky Avenue, 50, Petrozavodsk, Russia

E-mails: [1]vkarginowa@yandex.ru (Corresponding author); [2] kov8vol@gmail.com ; [3]insteco_85@mail.ru; [4] scherbaka@mail.ru*

Abstract. The transition to the use of eco-products is one of the directions for ensuring the sustainable economic development and security of territories. This makes it relevant to study the influence of various factors on environmentally responsible consumer behavior. The goal of this article was to determine the importance of economic interests in the system of factors that determine consumer behavior in relation to eco-friendly products. The results of a survey of 1102 residents of the Arctic zone of the Republic of Karelia (Russian Federation) served as the research data. The work was structured within the framework of the reasoned action approach and Maslow's theory, using the methods of descriptive statistics and confirmatory factor analysis. It was found that economic interests are one of the factors that determine consumption behavior; however, the significance of economic interests is less than that of ecological interests. The willingness to pay an increased price for renewable electric energy shows that economic interests mostly control the environmental consumption behavior of those with a low level of education, low living standards, and short-term budget planning (regardless of gender and age). Taking into account the identified connections, we propose tools to stimulate the purchase of environmental products. The study findings are of interest to authorities in order to popularize and distribute eco-friendly products, as well as their manufacturers to choose the best strategy for promoting the products to the market.

Keywords: eco-friendly products; purchase of eco-friendly products; ecological consumer behaviour; renewable energy; willingness to pay; the importance of the price of a product; behavioral beliefs; economic characteristics of an individual; sustainable development; environmental and economic safety

1. Introduction

The depletion of fossil resources, an increase in waste generation, and the disease rates of the population caused by the industrialization of agriculture make it urgent to abandon traditional products and switch to the use of their ecological alternatives—i.e., eco-friendly products. These products are made from natural ingredients, and they have a less negative impact on both the environment and human health during their production and consumption. In a number of cases, such products can be completely safe.

However, despite all of the advantages of eco-friendly products, their distribution presents significant difficulties: Eco-friendly products are less accessible, and consumers are not well acquainted with their brands or not always satisfied with the quality. One of the key problems is the price of such goods, which often exceeds—sometimes significantly so—the price of the usual products (Karginova-Gubinova, Shcherbak, et al., 2020).

It is known that each person acts based on their interests, which can be egotistical (maximizing personal gain), altruistic (maximizing the benefits of society) or biospheric, expressed in pro-ecological behavior, such as preserving and restoring the environment (Imaningsih et al., 2020) from previously accumulated damage. Sometimes, pro-ecological behavior is considered as a type of altruistic behavior(Groot et al., 2012), but there is no connection between such altruistic interests of the individual as, for example, peace and social justice, and the purchase and use of green goods (Imaningsih et al., 2020). If, in accordance with their biospheric interests, an individual strives to take care of nature and to carry out conscious consumption, then their economic interests can lead to a refusal to purchase eco-friendly products due to the fact that they are more expensive than existing analogues.

The purpose of this study was to estimate the significance of economic interests in the system of factors that affect consumer behavior in relation to eco-friendly products. The research tasks were as follows:
(1) to analyze the relationship between economic interests and the purchase of eco-friendly products;
(2) to estimate a degree of influence of economic interests on environmental consumer behavior in comparison to the influence of other groups of factors;
(3) to identify the characteristics of individuals for whom economic interests are of the greatest importance when purchasing eco-friendly products.
Thus, the following research questions are raised in this article:
(1) Is there a relationship between the economic interests of the population and the purchase of eco-friendly products?
(2) How much do the economic interests of consumer affect environmental behavior?
(3) For which individuals economic interests are of the greatest importance in buying eco-friendly products?

Consumer behavior of the population of the Arctic zone of the Republic of Karelia in relation to eco-friendly products was chosen as the object of this study. The subject was the role of economic interests in purchasing eco-friendly products. The willingness to pay an increased price for eco-products was examined using the example of renewable electricity.

Previously, the factors determining the purchase of eco-friendly products have been studied among consumers from different countries (e.g., the USA (Milovantseva, 2016), China (Tong et al., 2020; L. Wang et al., 2019; Yue et al., 2020), India (Aindrila Biswas, 2016), and northern countries such as Finland (Hartikainen et al., 2014), Sweden, Norway, etc.) and of different goods (food products: minced beef (Grebitus et al., 2013), potatoes (Grebitus et al., 2013), fruit (L. Wang et al., 2019), rice (Tong et al., 2020);electronics: mobile phones (Grankvist et al., 2019; Milovantseva, 2016), televisions (Min et al., 2017), etc.). However, these works mainly studied eco-friendly products in general or food products (Bangsa & Schlegelmilch, 2020; Zhang & Dong, 2020). The following analysis of these works showed that the predictors of consumer behavior in relation to green products

differ significantly by region and product group. For the Arctic zone of the Russian Federation, in-depth studies of the factors of ecological behavior have not previously been conducted. This, as well as the importance of the distribution of eco-friendly products for a sustainable development of the territory, determine the relevance of this work.

The novelty of the research is: the first, analysis of the environmental consumer behavior of the inhabitants of the Arctic zone of the Republic of Karelia embraces previously unexplored consumer group; the second, a comprehensive examination of the individual characteristics that shape their economic interests is performed.

The results obtained can be used by manufacturers of eco-friendly products for their successful promotion to the market, as well as by government entities and public organizations in order to form the conscious and responsible consumption of citizens. Ultimately, this will allow the production of competitive goods while minimizing harm to the environment, and, therefore, will enhance both the ecological and economic security of the regions.

2. Theoretical background

The theoretical framework of this research is represented by three blocks of works: the propensity to buy eco-products, the willingness to pay an increased price for eco-friendly products, and renewable electricity as an eco-product.

2.1. Propensity to buy eco-products

Factors affecting the purchase of eco-friendly products include the individual characteristics of the buyer (in particular, their values and beliefs), existing social norms and relationships, as well as the characteristics of the eco-products (Zhang & Dong, 2020).

Consumers with higher levels of environmental awareness (Al Mamun et al., 2018; Boztepe, 2012; Kanchanapibul et al., 2014) and environmental responsibility (Yue et al., 2020) are more likely to purchase green products. Long-term planning (Halder et al., 2020) and collectivism as a social norm (Halder et al., 2020; Sreen et al., 2018) also have a positive effect. Moreover, those buyers for whom interpersonal values are more important than intrapersonal ones (more social rather than personal orientation) demonstrate more stable behaviour (Grebitus et al., 2013). However, a high level of generalized trust does not lead to a greater propensity to buy eco-products.

Younger consumers are more committed to choosing eco-labeled products (Grebitus et al., 2015). However, the age factor is only relevant to certain types of eco-products, such as cosmetics, packaging, and bags (Kucher et al., 2019). In addition, buyers of ecological goods are distinguished by a higher income, their level of education (bachelor's degree and above), and concern for their health, particularly food safety (Golnaz Rezai, 2012).

Less inclined to purchase eco-friendly products are those customers who believe that it is the government that should be primarily concerned with environmental protection (Tong et al., 2020). Moreover, the reason for choosing traditional products may be that customers are more familiar with their brands (Wheeler et al., 2013).

2.2. Willingness to pay an increased price for eco-friendly products

The preferences regarding the price, as well as the quality, of eco-friendly products differ, while a number of consumers are ready to buy eco-products, even if they are more expensive than their less environmentally friendly

counterparts and/or are of lower quality (D'Souza et al., 2007).Overall, price sensitivity reduces the consumption of environmental goods (Hartikainen et al., 2014; Yue et al., 2020).

The willingness to pay an increased premium for the purchase of an eco-friendly product is associated with involvement in pro-ecological behavior, environmental beliefs(Milovantseva, 2016), the level of environmental awareness (X. Wang et al., 2020), and orientation toward product safety, as well as having a higher income (L. Wang et al., 2019) (i.e., a higher purchasing power(Kucher et al., 2019)).According to the study by Wang et al., the willingness to pay an increased price for organic products is primarily dependent on the household income (X. Wang et al., 2020). In addition, a 2010 analysis of British households showed that those with higher incomes spend more on groceries and buy healthier food (Pechey & Monsivais, 2016). This can be seen as one of the reasons why wealthy consumers are willing to pay more for organic food.

Women(Chekima et al., 2016; Grankvist et al., 2019) (especially housewives(X. Wang et al., 2020) and mothers (Min et al., 2017))are willing to pay higher prices than men are. Therefore, the decision to purchase an eco-friendly product among men depends on its cost more often than it does among women (Kucher et al., 2019). Additionally, people with a good education(Min et al., 2017; X. Wang et al., 2020) and with certain types of occupations (e.g., civil servants (Chekima et al., 2016; X. Wang et al., 2020)) demonstrate a higher willingness to pay a higher price.

There is a correlation between the willingness to pay for organic products and age, but some studies show that the willingness to pay is higher among young people (Hersch & Viscusi, 2006; Min et al., 2017), and sometimes among older people (Shahsavar et al., 2020). For example, older consumers are less ready for an increase in gasoline prices to protect the environment than younger consumers. Moreover, it has been established that this difference cannot be explained by economic and social characteristics, differences in information, health risk assessments, or the degree of concern about climate change (Hersch & Viscusi, 2006). Conversely, it has been confirmed that Czech youths are reluctant to purchase eco-friendly furniture (Shahsavar et al., 2020). Based on this, we can draw a conclusion about the existence of different predictors and about their multidirectional impact on different environmental products.

There are also cross-country differences in the willingness to pay more for organic products. For example, a study of attitudes toward green mobile phones showed that, on average, students in Sweden and Norway were willing to pay more for them than students in Germany (Grankvist et al., 2019). In 2012, in the European Union, the smallest shares of those willing to pay for eco-friendly products was in Lithuania (64%), Portugal (64%) and Estonia (65%), while the largest was in Austria (88%). The size of the premium to the price that buyers are willing to pay also differs: in the European Union, the predominant share is ready for a premium of 5%, but in countries such as Austria, Bulgaria, Germany, Denmark, Luxembourg, Slovenia, and Sweden, most residents are ready to pay a premium of 6%–10%. This discrepancy can be partially explained by the frequency of purchases: the more often eco-friendly products are purchased, the higher the willingness to pay an increased premium for them, but this correlation cannot be called all-encompassing or strong. Rather, in this case, it is more correct to state that consumers who do not choose ecological goods do not trust their quality and are therefore not ready to pay more for them than for other goods (European Commission, 2013).

The desire for self-improvement (in social status, power, etc.) has a negative impact on the willingness to pay more (Grankvist et al., 2019). In a number of countries, particularly India, for buyers, the functional characteristics of eco-friendly products dominate the willingness to pay for them (A. Biswas & Roy, 2016).

2.3. Renewable (green) energy as an eco-product

For consumers in Shanghai (China), low income and poor awareness of the benefits and features of green energy are the primary obstacles to the spread of clean energy (Vand et al., 2019). In Poland, age, income level, education, competence, attitude toward the environment, and peer support are named as factors determining the willingness of the population to pay an increased price for green energy. Polish consumers show a relatively low willingness to pay a premium for clean electricity, and this is due to the low level of GDP per capita, the lack of knowledge about green energy, and the experience in using its tariffs (Kowalska-Pyzalska, 2019).

Interestingly, the willingness to pay an increased price for renewable energy also differs in relation to the sources of its generation. Therefore, for example, solar energy is the most valuable from the point of view of consumers, while the least valuable are biomass, agricultural methane (Borchers et al., 2007) and hydropower (Sundt & Rehdanz, 2015).

2.4. Generalization of the theoretical framework

Since the purchase of an eco-product is impossible without agreeing with its higher price, the identified factors affecting the willingness to buy environmental products are certainly similar to the factors of the willingness to pay an increased price for an eco-friendly product. Thus, among the common factors are a high level of education and income, an orientation toward the safety of goods, etc.

Nevertheless, buying an eco-product requires not only the willingness to pay for it, but also satisfaction with its quality, access to the product, and much more. According to this, it can be assumed that the group of factors for the purchase of eco-friendly products should be larger than the set of factors affecting the willingness to pay for an eco-friendly product.

Analysis of the theoretical basis shows that the willingness to pay an increased price for eco-products varies by age group, but there are conflicting conclusions about the effect of age on the willingness to pay more. The presence of these contradictions necessitates clarification of the importance of age. Intercountry discrepancies in the willingness to pay an increased price show that separate studies are required for individual territories, with their socio-cultural characteristics and traditions.

Based on the analysis of previous studies, the following hypotheses were formulated:
H0: The economic interests of individuals are one of the factors that determine their consumer behavior.
H1: Behavioral beliefs shaped by economic interests have a greater impact on purchasing eco-friendly products than beliefs shaped by environmental interests.
H2: In ecological consumer behavior, economic interests are the most constraining factor for men, older people, and people with a low level of education, a low standard of living, and a short-term budget planning period.

3. Methodology

Research on consumer behavior in relation to eco-friendly products is mainly based on the assumption of linear and rational decision-making (Bangsa & Schlegelmilch, 2020). A special characteristic of this work was the consideration of consumer behavior within the framework of the reasoned action approach and Maslow's theory.

According to the reasoned action approach, behavioral beliefs and beliefs about norms and control respectively form attitudes toward behavior and perceptions of norms and control, which, in turn, lead to the emergence of behavioral intentions. However, the intentions of the behavior determine the behavior itself, but it is constrained by the presence of effective control (Fishbein & Ajzen, 2009).

In this study, we focused on examining the influence of beliefs about behavior and norms. Due to the fact that, in the Russian Federation, a forced transition to a widespread use of eco-friendly products is still only being discussed, there is no control over the purchase of eco-friendly products and thus it was not included in this study.

Abraham Maslow compiled a hierarchy of basic human needs: physiological needs, needs for security, love, and respect, and self-actualization (Maslow, 1970). Later, he emphasized transcendence in self-actualization, defined in a broad sense as the actualization of the entire society, nature (Maslow, 1976). Thus, in the framework of Maslow's theory, pro-ecological behavior and the purchase of eco-friendly products are possible only when an individual reaches a certain level of income that allows satisfying the needs of a lower level.

The data required for the study were obtained through a questionnaire survey. Among the works that form the methodological and informational basis of the questionnaire used in this study, worth noting are the questionnaires from the Eurobarometer Surveys and (Liobikienė et al., 2017).

A total of 1102 residents of six municipalities of the Republic of Karelia included in the Arctic zone of the Russian Federation were interviewed: Belomorsky municipal district, 241 people; Kalevalsky municipal district, 120; Kemsky municipal district, 188; Loukhsky municipal district, 125; Segezha municipal district, 220; the urban district of Kostomuksha, 208. The sample was represented by the population aged 18–72 years, displaying information on gender, age, area of residence, and living conditions (private house or apartment building). The sampling error did not exceed 3%.

The required calculations were made in Microsoft Excel.

Within the framework of the selected methodological provisions to achieve the set goal, we conducted the following:
1.   Analyzed the frequency of various forms of consumer behavior in relation to eco-friendly products and behavioral beliefs formed by economic interests by methods of descriptive statistics, revealing the most common relationships.
2.   Studied the existence of a correlation between the frequency of purchasing eco-products/willingness to pay an increased price for eco-friendly products and the following:
1.   Sociodemographic characteristics of the population: Gender, age (up to 35 years old, 36–54 years old, 55 years old and older), and educational level (elementary vocational and lower, vocational education, incomplete higher education and higher).
2.   Economic characteristics: The standard of living of the family and the period of family income planning.
3.   Behavioral beliefs:
2.3.1. Formed by environmental interests: The concern for the generation of household waste, the concern for the depletion of natural resources, and the assessment of the degree of environmental impact of eco-friendly products (to analyze the frequency of purchasing eco-products)/the assessment of the possibility of reducing the negative impact of energy on the environment and climate in the production of renewable energy (for the willingness to pay an increased price for eco-friendly products).
2.3.2. Formed by economic interests: The importance of the price of a product, the willingness to pay an increased price for eco-friendly products using the example of green energy (only for analyzing the frequency of purchasing eco-products), and the assessment of the positive impact of environmental protection on economic growth.
4.   Beliefs about norms: Environmental policies should not cost extra money, and family and friends would approve of buying and using eco-friendly products.

To investigate the presence of these dependencies, a confirmatory factor analysis was carried out, involving chi-square, *p*-value, and the root-mean-square error of approximation (RMSEA(Cramer, D., 2003)) calculation. The

acceptable level of RMSEA significance for the model was taken as 0.05 or higher (in accordance with(Brown, 2006)).

4. Results

The survey showed that more than half of the inhabitants of the Arctic zone of the Republic of Karelia, namely, 51.3%, sometimes bought eco-friendly products; however, the percentage of those who make such purchases often was almost 4times less (Figure 1). At the same time, almost a third of the population reported not currently purchasing eco-friendly products and not planning to in the future. A small share (5.9%) used to buy eco-friendly products earlier, but had stopped.
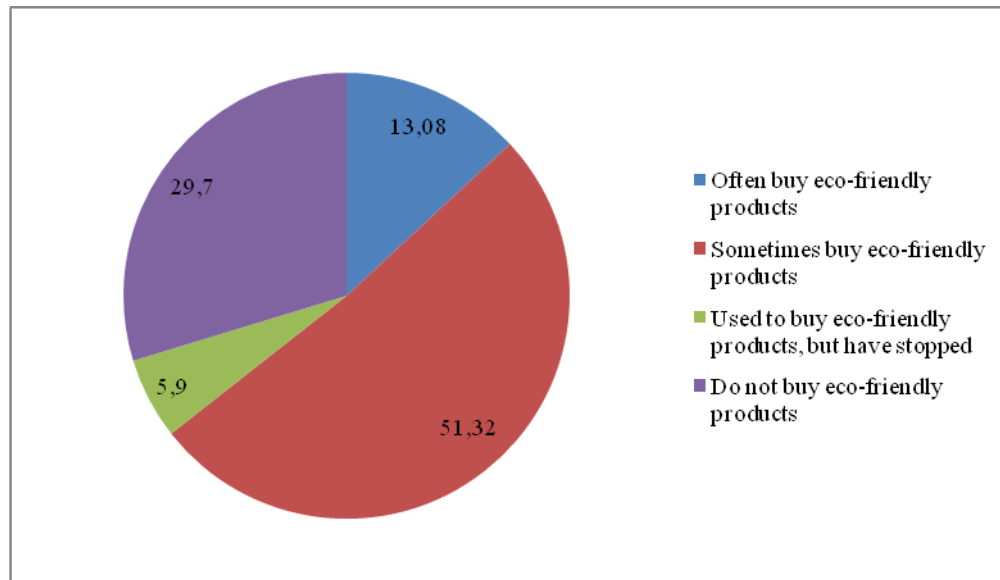
Figure 1. Distribution of the residents of the Arctic zone of the Republic of Karelia by frequency of purchasing eco-friendly products(%).Source of data: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

When choosing products, the price is a significant factor: it was ranked as very important for 57.7% of the respondents and as moderately important for 33.9%, played a secondary role for 5.7% and was absolutely not important for only 2.6%.

Mostly, the surveyed population (60.4%) was not ready to pay more for renewable electricity that would reduce the burden on the environment. Less than a third (26.4%) were willing to pay a little more, with 1.7% willing to pay one and a half times more and 0.8% willing to pay twice as much. The remaining 10.6% were undecided.

It is evident that the price importance factor correlates with the willingness to pay an increased price for eco-friendly products. For approximately the same share of the population, the purchase price was very important (57.7%) and they were not ready to pay more for renewable electricity (60.4%). In addition, the shares of those for whom the price was moderately important (33.9%) and who were willing to pay a little more for electricity (26.4%) practically coincided as well.

Among those who buy eco-friendly products, the significance of the price was lower; the price played a secondary role or was absolutely not important (Table 1). Among those who do not purchase eco-friendly products, the largest share was composed of those for whom the price was very important—70.6%.

Table 1. Frequency of the combinations of various forms of consumer behavior in relation to eco-friendly products and behavioral beliefs regarding the price of the product

Behavioral belief	Frequency of purchasing eco-friendly products			
	Often	**Sometimes**	**Used to buy but stopped**	**Never**
Price importance when choosing goods: Very important	37.50	54.87	63.08	70.64
Moderately important	38.19	39.65	32.31	22.32
Plays a secondary role	13.89	4.60	3.08	4.59
Absolutely not important	10.42	0.88	1.54	2.45
Willingness to pay more for renewable energy: Ready to pay 2 times more	2.08	0.71	0.00	0.61
Ready to pay 1.5 times more	6.25	1.24	3.08	0.31
Ready to pay a little more	43.06	29.73	23.08	14.07
Not ready to pay more	40.28	56.64	64.62	74.92
Undecided	8.33	11.68	9.23	10.09

Source: Compiled on the basis of the conducted questionnaire survey.

At the same time, 40.3% of those who often buy eco-products were not ready to pay more for renewable electricity in comparison to its traditional alternative. For those purchasing eco-friendly products less often or not purchasing them at all, this percentage was even higher. Thus, the less often eco-friendly products are purchased, the lower the willingness to pay an increased price.

Next, we analyzed the existence of a relationship between the frequency of purchasing eco-friendly products and the various characteristics and beliefs of individuals.

Based on the data in Table 2, we can conclude that not all of the selected characteristics were factors that influence the purchase of eco-friendly products. Taking into account the established level of significance of the RMSEA, among the economic characteristics, we can observe that the living standard had a reasonable degree of influence, but the period of budget planning did not. For example, of those who believed that they live in full prosperity, without denying themselves anything, 61.3% bought eco-friendly products, which is 4.7 percentage points more than in the group of people living from paycheck to paycheck, and 36.3 percentage points more than in the group borrowing money even for food.

Table 2. Results of a confirmatory factor analysis for the frequency of purchase of eco-products

Factors	Chi-square of the sample	Critical value at $\alpha=0.05$	*p*-Value
1.Sociodemographic characteristics Gender	13.97	7.81	0.0029
Age	18.58	12.59	0.0049
Education	11.36	12.59	0.0779
2. Economic characteristics Standard of living	72.65	21.03	0.0000
Income planning period	44.56	25.00	0.0001
3. Behavioral beliefs 3.1. Formed by ecological interests Concern for generation of household waste	43.58	21.03	0.0000
Concern for depletion of natural resources	41.70	21.03	0.0000
Assessment of the degree of environmental impact of eco-friendly products	215.41	16.92	0.0000
3.2. Formed by economic interests Importance of the price of the product	99.61	16.92	0.0000
Willingness to pay an increased price for eco-friendly products using the example of green energy	86.65	21.03	0.0000
Assessment of the positive impact of environmental protection on economic growth	17.06	21.03	0.1475
4. Beliefs about norms Environmental policies should not cost extra money	37.19	21.03	0.0002
Family and friends would approve of buying and using eco-friendly products	236.29	16.92	0.0000

Source: Calculated based on the data of the conducted questionnaire survey.

The degree of significance of the standard of living was comparable to the significance of such a sociodemographic characteristic as gender (the influence of age was insignificant and the frequency of purchasing ecological goods did not depend on the level of education). Men were somewhat more likely to purchase eco-friendly products than women (68.3% versus 59.0%), although more women made such purchases frequently (15.7% versus 12.2%). Moreover, 31.7% of men and 41.0% of women neither bought nor intended to buy eco-friendly products.

Among the considered behavioral beliefs based on both environmental and economic interests, there were insignificantly influencing and non-influencing factors; however, in general, the degree of significance of environmental interests (the assessment of the degree of influence of eco-friendly products on the environment) can be recognized as being higher than that of economic interests (the significance of product prices). However, environmental consumer behavior was observed to depend only on individual economic interests, and not on public ones.

Thus, the lack of growth in demand for eco-friendly products, although being due to the individual economic interests of citizens, can primarily be associated with low environmental literacy, lack of knowledge about reducing generated household waste and saving natural resources in the production and use of eco-friendly products, and failure to realize the possibility of achieving economic growth through transition to the production and consumption of eco-friendly products.However, the average assessment by the population of the concern for the generation of household waste on a five-point scale was 4.34, and the average assessment of the concern for depletion of natural resources was 4.26. Assessing whether environmental protection contributes to economic growth, 25.4% of respondents found it difficult to give an answer, while the majority of the remaining respondents agreed with this statement (35.4% agreed completely and 45.9% agreed rather than disagreed).

The lack of approval of purchasing eco-friendly products by the immediate circle, i.e., family and friends, also played a significant role. Similarly, we considered the results of the analysis of consumers' willingness to pay an increased price for renewable electricity (Table 3).

Table 3. Results of a confirmatory factor analysis for the willingness to pay an increased price for renewable electricity of consumers

Factors	Chi-square of the sample	Critical value at $\alpha=0.05$	*p*-Value
1.Sociodemographic characteristics Gender	4.14	9.49	0.3879
Age	10.41	15.51	0.2376
Education	32.22	15.51	0.0001
2. Economic characteristics Standard of living	113.30	26.30	0.0000
Income planning period	180.67	31.41	0.0000
3. Behavioral beliefs 3.1. Formed by ecological interests Concern for generation of household waste	48.48	26.30	0.0000
Concern for depletion of natural resources	49.61	26.30	0.0000
Assessment of the degree of environmental impact of eco-friendly products	50.74	26.30	0.0000
3.2. Formed by economic interests Importance of the price of the product	185.34	21.03	0.0000
Willingness to pay an increased price for eco-friendly products using the example of green energy	22.60	26.30	0.1250
Assessment of the positive impact of environmental protection on economic growth	96.43	26.30	0.0000
4. Beliefs about norms Environmental policies should not cost extra money	45.17	21.03	0.0000
Family and friends would approve of buying and using eco-friendly products	4.14	9.49	0.3879

Source: Calculated based on the data of the conducted questionnaire survey.

The willingness to pay an increased price for renewable electricity to the greatest extent unsurprisingly depended on the importance of the price (the individual economic interests), but public economic interests, as well as the frequency of purchasing eco-friendly products, did not have any influence. Moreover, significant were the economic characteristics of the individual (the living standards and the period of budget planning), the beliefs about norms, and the level of education. It is worth noting that gender and age in this case were not influencing factors. The environmental interests were not significant.

Consequently, increasing the financial literacy of the population for the transition to long-term planning of the household budget can be considered as a special direction of the formation of readiness for a higher price of eco-friendly products. In addition, it is in the long-term perspective that the benefits of purchasing certain types of eco-friendly products (e.g., care products) can be assessed.

Based on the above, hypothesis H0 can be confirmed: economic interests are one of the factors that determine the consumer behavior of individuals.

Hypothesis H1 can be rejected: the importance of environmental interests exceeds the importance of economic interests. Among the individuals who agreed that eco-friendly products have a positive impact on the

environment, and at the same time who considered the price of a product to be very or moderately important, 72.5% stated that they bought eco-friendly products, while 27.5% did not (Figure 2).
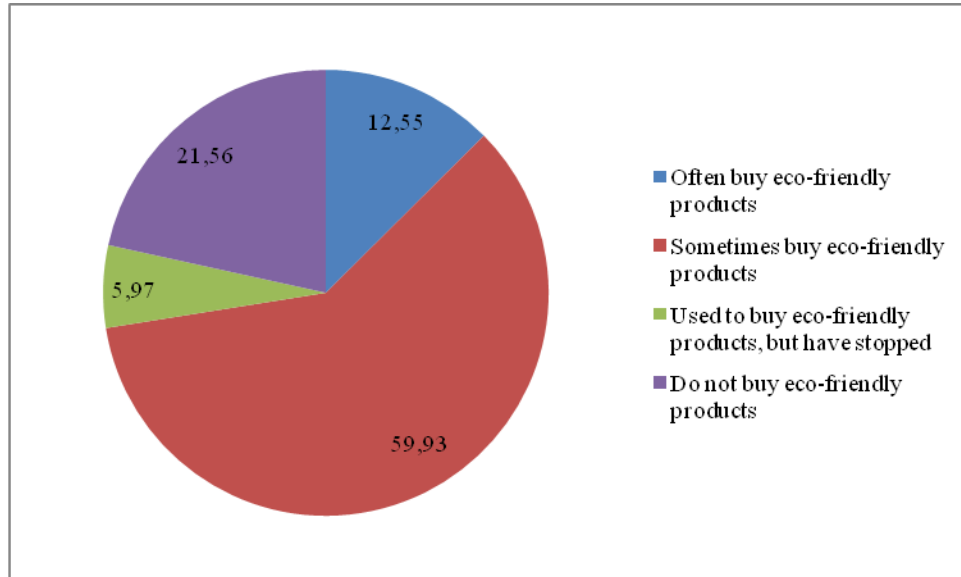
Figure 2. Distribution by the frequency of purchasing eco-friendly products of those who believe that they have a positive impact on the environment and who consider the price to be very or moderately significant(%). Source: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

Based on the data regarding renewable electricity, hypothesis H2 can be confirmed only partially: economic interests mostly constrain the ecological consumer behavior of people with a low level of education, a low standard of living, and a short-term budget planning period, but not men or older people.

4. Discussion

Authors should discuss their results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted.

As shown in this study, for most individuals, behavioral beliefs based on environmental interests had a greater impact on the purchase of eco-friendly products compared to beliefs shaped by economic interests. This conclusion contradicts Maslow's theory of the satisfaction of physiological needs overriding safety and transcendence. However, this discrepancy can be explained by a higher standard of living. Among those who believed that eco-friendly products have a positive impact on the environment and at the same time believed that the price is very or moderately significant, as well as those who rated their living standards higher, were more likely to buy environmental products, while those who rated them lower were not (Figure 3). For example, 64.2% of those living in prosperity purchased eco-friendly products, and so did only 36.4% of those who borrow money even for food (the presence of low-income buyers of environmental goods may be due to the rural nature of the surveyed territories, where purchases of products from local farmers are quite common). Thus, with the possibility of satisfying the needs of a higher level, the satisfaction of the needs of a lower level changes.
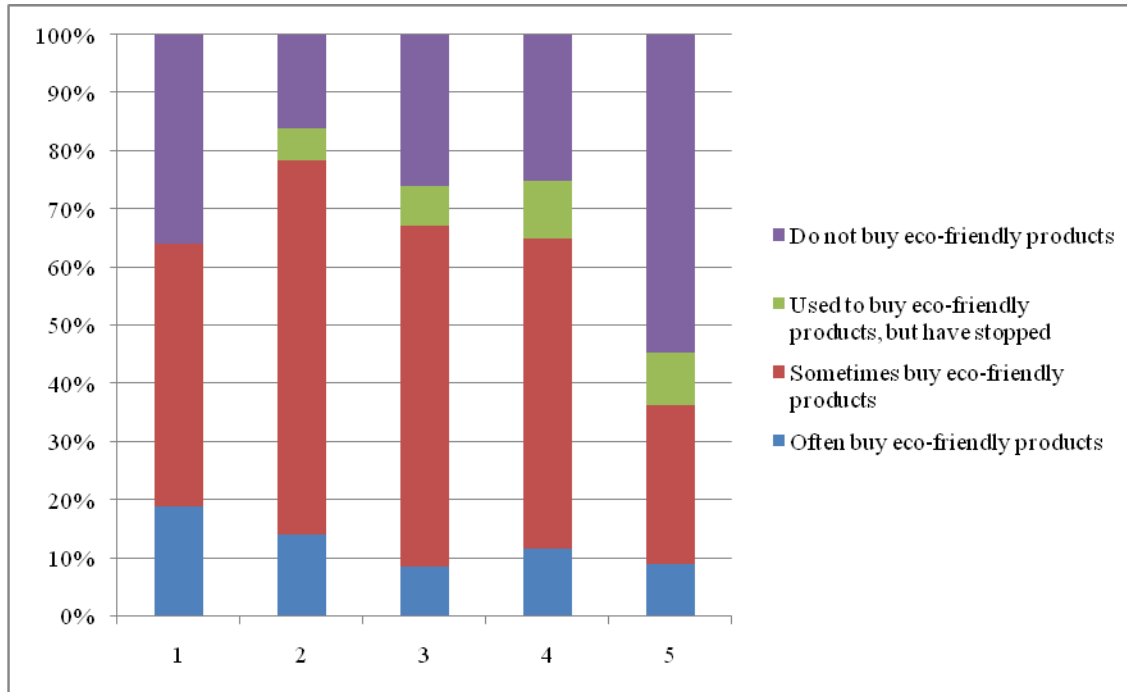
Figure 3. Frequency of the purchases of eco-friendly products and the living standards of those who believe that eco-friendly products have a positive impact on the environment and who consider the price to be very or moderately significant. (1)Living in full prosperity; (2) having to save up for larger purchases; (3) living from paycheck to paycheck, where the money is only enough for current expenses (food, maintenance bills, etc.); (4) having enough money only for food and the most necessary things, while maintenance and utility bills are often postponed; (5) having to borrow money for food from friends and acquaintances. Source of data: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

Another interesting point is the greater propensity of men to buy eco-friendly products in comparison to women. Moreover, the more frequent purchases of eco-friendly products by men cannot be explained by a higher standard of living (the calculations showed no connection between these indicators). While most researchers conclude that women are more active in purchasing eco-friendly products(Liobikienė et al., 2017) and other forms of eco-consumption (e.g., reducing the amount of water used(Gilg & Barr, 2006)), there are studies showing that gender does not matter in shopping for eco-friendly products (Zhao et al., 2014). It can be assumed that the resulting discrepancies are explained by the different distribution of values in cultures, as well as by the different roles of men and women in organizing the household under different sociocultural conditions. Thus, in further research, it would be advisable to include the measurement of the degree of participation of individuals in the decisions and consumption practices of the household. It should also be noted that, according to the survey, men buy eco-friendly products more often than women do, but a larger proportion of women do it often. Accordingly, it can be assumed that, in the absolute amount, a greater number of eco-friendly products will be bought by women, not men. This assumption should be verified in further studies.

However, there is no connection between gender and the willingness to pay an increased price for renewable electricity. Women's acceptance of a higher price for eco-friendly products has been shown in other studies (Chekima et al., 2016; Grankvist et al., 2019; Min et al., 2017; X. Wang et al., 2020). This discrepancy can be explained by the existing asymmetry in the perception of the value of eco-friendly products not only by age, but also by gender.

A similar explanation is possible for the existence of a relationship between the level of education and the willingness to pay more for renewable electricity than for traditional electricity, while there is no relationship between the frequency of purchasing eco-friendly products and the level of education. This is due to the fact that, these days,there is an increasing number of sources of information on ecology, which allow people to significantly expand their knowledge in this area outside of the classical multi-stage education system. However, understanding the characteristics of such goods as electricity from renewable sources requires a certain knowledge base.

Thus, we can conclude that the identified factors that determine the consumer behavior in relation to eco-friendly products of the population of the Arctic zone of the Republic of Karelia correspond to most of the previously conducted studies. This increases the scientific value of the main conclusion—determining the degree of influence of the economic interests of individuals in comparison to other factors—in connection with the possibility of transferring this conclusion to other groups of consumers.

This research, however, is subject to several limitations. A number of the limitations are due to the fact that the collection of baseline data was carried out in the context of the unfolding coronavirus disease 2019 (COVID-19) pandemic. Despite the fact that at the time of data collection, the number of infections in the study region did not exceed 316 people per 100,000 people (with the total number of people living in the region as of 1 January 2020 being 113,572, the number of cases at the start date of the study on 8 July 2020 was 359 people), strict restrictive measures in the studied territories were introduced from 1 April 2020. These included both the introduction of a self-isolation regime for citizens and the restriction and suspension of the provision of services and commercial activities involving physical contact between consumers and workers or consumers with one another. These restrictions managed to have a certain impact on the economic activity and well-being of the inhabitants of Karelia, as well as on the level of their consumption and consumption habits. Nevertheless, the research toolkit was directed at identifying common practices, and three months is clearly not enough for the formation of new consumer habits of individuals. Moreover, at that time, people viewed the COVID-19 pandemic as a temporary phenomenon and, obviously, perceived its consequences as temporary. The interviewers took notes when people talked about a significant change in their habits and preferences due to the pandemic, but such an emphasis on the specifics of the current situation was rather an exception and was not widespread.

We also note that the study was conducted in compliance with all anti-epidemic and sanitary standards, which made it difficult for the interviewers and the respondents to interact directly, which could have some impact on the respondent's openness in answering questions.

Summarizing the results, it should be noted that each product has its own specific characteristics; therefore, the conclusions drawn based on the willingness of individuals to pay an increased price for renewable electricity cannot be fully transferred to their behavior in relation to other eco-friendly products. In addition, the lower interest in eco-friendly products in comparison to their existing traditional counterparts can be associated with a lower prevalence of eco-friendly products, a lack of knowledge about their brands, and dissatisfaction with their quality (it is known that certain types of eco-friendly products cannot fully functionally replace traditional counterparts (Karginova-Gubinova, Tishkov, et al., 2020)).

Promising in terms of further research are the following:
1. Studying the dynamics and factors of environmental consumption during the COVID-19 pandemic and the manifestation of its socioeconomic consequences.
2. Analysis of the reasons for the various results of ongoing research in the field of environmental consumption in a number of countries by organizing and conducting an intercountry international study with a single methodological toolkit.

Conclusions

The economic interests of individuals are one of the factors that significantly limits the distribution of eco-friendly products, but the importance of economic interests is less than importance of environmental interests (almost three quarters of individuals with both economic and environmental interests buy eco- products). First of all, economic interests are holding back the purchase of people with a low level of education, a low standard of living, and a short-term budget planning period, but not men or older people.

Accordingly, to ensure economic and environmental safety, the global community faces two urgent tasks: reducing the cost of eco-friendly products and reducing the negative impact of economic interests on environmental consumer behavior.

To ensure a lower cost of eco-friendly products, it is necessary to further develop the equipment and technologies, optimize the production and logistics chains, and improve cooperation. It is also possible to establish quotas for eco-friendly products within the framework of public procurement, to hold exhibitions and fairs, to organize access for eco-friendly products, especially local ones, to large retail chains and to put them on marketplaces, to subsidize them on a competitive basis for obtaining green labels, etc.

In order to reduce the negative impact of economic interests on environmental behavior, and the purchase of eco-friendly products in particular, it is necessary to popularize an ecological lifestyle, as well as to increase environmental literacy and consumer awareness of the long-term consequences of purchasing non-eco-friendly products for nature and public health. The population should understand not only the importance of reducing the volume of waste generated, but also the possibility of achieving this by switching to eco-friendly products. Currently, as shown above, the majority of consumers do not comprehend this connection. It also requires an understanding of the relationship between companies' transition to the production and consumption of environmental products and the economic growth of the territory. These measures will also increase the approval of eco-friendly purchases by family and friends. Improving financial literacy and stimulating the transition to long-term budget planning can be considered a separate approach for increasing the willingness to pay a higher price for eco-friendly products.

At the same time, there should also be economic incentives for consumers to purchase eco-friendly products. Thus, for example, currently in the study area, the payment for waste collection does not depend on the volume of its production. In the case of using eco-friendly products, the volume of waste generated by households will decrease. Consequently, the fee for the collected waste should also decrease. Ecological goods can also be recycled. Therefore, it is required to ensure the possibility of delivering waste for recycling. Currently, the organization of the mass collection of sorted waste, especially in remote areas, is only being planned.

Manufacturers, first of all, can be recommended to focus their products on the consumer groups least susceptible to the negative influence of economic interests: men, young people, and highly educated people (the latter in relation to goods that have the greatest price difference to their traditional counterparts).

We assume that the measures described above will increase the demand for eco-friendly products and, accordingly, their supply. Thus, the economy will come closer to achieving sustainable development without additional harm to the environment, and ensuring the ecological and economic security of the territories.

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Valentina KARGINOVA-GUBINOVA is the Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: economic security, environmental economics, conflicts of interest, and regional economics.
ORCID ID: orcid.org/ 0000-0002-8630-3621

Aleksander VOLKOV is the Junior Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. Research interests: environmental behavior, green purchase, sustainable environmental and economic development, environmental and social responsibility of businesses, consumption and human capital.
ORCID ID: orcid.org/0000-0003-0451-8483

Sergey TISHKOV is Secretary for Science in the Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: innovation development, renewable energy, spatial economic, regional innovation systems.
ORCID ID: orcid.org/0000-0002-6061-4165

Anton SHCHERBAK is the Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: energy efficiency, renewable energy, economic security, waste management, and regional economics.
ORCID ID: orcid.org/ 0000-0002-2259-9953

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DIGITAL COMPETENCIES' ASSESSMENT AND CHALLENGES OF ACADEMIC STAFF: THE CASE OF LATVIA[*]

Iveta Mietule [1], Lienite Litavniece [2], Jelena Lonska [3*], Olga Burova [4]

[1,2,3,4] Rezekne Academy of Technologies, Atbrivosanas alley 115, Rezekne, Latvia

E-mails: [1] Iveta.Mietule@rta.lv, [2] Lienite.Litavniece@rta.lv, [3] Jelena.Lonska@rta.lv (Corresponding author), [4] o_burova@hotmail.com*

Abstract. The need to develop digital competences has long been emphasized, but only in the state of emergency due to COVID-19, it has become a real necessity. The study process in higher education institutions is organized remotely, which means that academic staff have essential digital competencies to ensure a certain level of quality. The aim of the research is to study the self-assessment of the digital competencies of the academic staff and the possibilities of its improvement. In the course of the research, there were surveyed the representatives of the academic staff of regional higher education institutions of Latvia, who were asked to assess their digital competencies. When analysing the obtained data, it was taken into account whether the academic staff has an IT-related education or occupation. As a result, it was concluded that, in general, the most significant problems for academic staff are content creation and information processing, which are essential for the successful implementation of their job responsibilities. Accordingly, the academic staff is also interested in developing these competencies in particular.

Keywords: academic staff; digital competencies; Information and Communication Technology (ICT).

1. Introduction

The global economy and society as a whole are open to information and communication technologies (ICT) and expect the growth of added value and productivity. The sector of higher education plays an important role in the growth of the country's economy, public expectations include the quality of higher education as a factor for growth. Higher education institutions (HEIs) are required to demonstrate the ways in which they respond to the social and economic needs of society. This refers to multiple areas: their actions to enhance graduate employability, their short- and long-term contribution to the growth of national economics and local development, and the ways in which they are stimulating the establishment of new enterprises, and innovations in existing firms. HEIs may demonstrate entrepreneurialism and innovation in many ways, one of them is how they embed digital technology into their activities (Heinnovate, 2018). The set of skills and competencies of the academic staff plays an important role in the quality of higher education, which multiplies the development of entrepreneurship and growth of the economy. The higher education is characterized by both academic traditions and the search for innovations. Changes in approaches and paradigms in education are always complicated. Today, structural long-term education reforms are not possible without a radical improvement in the skills and competences of academic staff, which basically includes the development of digital competences. The research paper pays special attention to one of the today's priority issues and challenges in higher education - the readiness of the academic staff to use ICT in the provision and administration of the study process. ICT are evolving rapidly and the issues surrounding their use in education are becoming increasingly complex. In order to use ICT tools effectively in the study process, it is necessary to improve the digital skills and competencies of the academic staff.

The aim of the research is to analyze the self-assessment of the digital competencies of the academic staff and the possibilities of its improvement.

Within the framework of the research, **a hypothesis** was put forward - the level of self-assessment of the digital skills of the academic staff and the professional activity or education of the staff in the field of ICT are interdependent values.

The significance of the research becomes especially essential in the Covid-19 emergency situation, when thanks to ICT technologies it was possible to do business and implement the study process in HEIs. It is clear that the changes brought by the Covid-19 emergency situation are not the short-term ones – the digital transformation will not stop, it will only accelerate to continue. Those enterprises and HEIs that are able to take the advantage of the benefits provided by technologies will definitely have a better chance of winning the competition. Taking into account the fact that the digital competences of the workforce in all spheres and sectors will be a key advantage of competitiveness for both employees and enterprises, it is important for a high-level workforce to develop these competencies in a timely and sufficient manner. Today's students are the human capital of tomorrow, the quality of which largely depends on the competencies of the academic staff of universities. The assessment of digital competences in all areas has become increasingly important, both in assessing the professional skills of employees and in developing curricula at all levels.

The novelty of the research is related to the fact that for the first time a self-assessment of digital competencies of the academic staff of the regional higher education institutions was performed based on the Europass approach to the assessment of digital competencies.

The research limitations are related to the formation of selection amount, when only the elected academic staff was interviewed.

The scientific research methods that were used in the research are as follows: monographic method, content analysis, survey, data processing with SPSS to determine the mutual independence of statistical indicators.

2. Literature review

The authors of the research focus on the **digital competence** as one of the eight key competences defined by the European Commission. This is defined as "the confident and critical use of Information Society Technology for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" (European Commission, 2006). Digital competence also referred to as digital literacy, encompasses a set of basic digital skills described in five areas, covering information and data literacy, online communication and collaboration, creation of a digital content, safety and problem solving. Digital competence is about the ability to apply those digital skills (knowledge and attitude) in a confident, critical and responsible way in a defined context (e.g. education) (European Commission, 2016; Brolpito, 2018; Kirillova et al., 2019; Shevyakova et al., 2021).

In the current information age, educational institutions at all levels are expected to play a crucial role as a driving power for generation of knowledge and learning environment. The renewed EU agenda for higher education emphasizes the need for higher education institutions to address digital transformation, implement digital learning strategies and exploit the potential of technology to the benefit of their staff and students (European Commission, 2017). Digital technology has been used to improve the accessibility and provision of education, in particular at the university level, offering new tools and solutions for innovative pedagogies and distance learning. For HEIs, dealing with digital transformation means introducing new digital processes in their organisations, adopting new digital teaching methods and tools, helping students in achieving the skills and competencies needed to act in digitalized societies and economies or having open science policies. It also means adopting a broader view of their role as actors of digital innovation. HEIs, with adequate policies and support from the government, can have an important role in helping enterprises adopt emerging technology and acquire relevant digital skills for their workers (OECD, 2019a).

Undoubtedly, digital competencies are becoming important in all sectors of the economy starting from agriculture to industry and services due to the increasing ubiquity of ICTs and growing capabilities of new technologies. Digital competencies are the skills and capabilities that enable businesses to exploit opportunities provided by ICT, to ensure more efficient and effective performance, to explore new ways of conducting business and establishing new businesses. Be it a start–up, a small or micro company or a medium company operating for decades on the market – they all need a certain set of digital competencies to be competitive, productive and innovative. Digital technologies offer new scope for entrepreneurship because digitalization brings about fundamental changes to the organization of production, how businesses are set up and who can become an entrepreneur, even without a lot of capital (United Nations, 2019). Digital technologies can be enablers, outcomes, and contexts of digital entrepreneurship at the same time (Davidsson et al., 2018; Recker and Von Briel, 2019).

Today, we are at the beginning of the so called 4.0 industrial revolution, it will lead to a digital transformation of our economies and societies. Representatives of a real economy sector consider the crucial one the problem of insufficient digital competencies and lack of literacy in the sphere of IT on the part of entrepreneurs and workforce. Fortunately, fundamental knowledge can easily be obtained by upskilling or reskilling of the current workforce as short-term measures (Hoell et al., 2018) and maintained in a process of lifelong learning. Even though in the first European skills and jobs survey, the majority of employees (between 60% and 80 %) reported only needing a basic or moderate level of ICT skills for their job (Cedefop, 2018), one strong indicator for the

digital transformation of the professional world is the fact that about 70% of newly emerged job titles are directly related to digital technologies (Zenhäusern & Vaterlaus, 2017).

Digital technologies have also created and grown the gig (or sharing) economy and generated new entrepreneurial opportunities and new types of entrepreneurship called digital entrepreneurship. Digital entrepreneurship – the intersection of digital technologies and entrepreneurship – is gaining increasing importance in the global economy and scholarly community. Digital entrepreneurship focuses on the design, use, and commercialization of digital technologies in the context of creating new economic activities and, importantly, how both digital technologies and entrepreneurial processes interact and shape each other (Shen et al., 2018; Elia et al., 2020).

However, several challenges remain with respect to promoting digital entrepreneurship. One of the challenges to building digital skills among youth is modernising education and training systems to ensure that teachers are equipped with the skills and resources to teach basic and advanced digital skills to students (OECD, 2019b). In the process of integrating digital technology into education, critical aspects in its success are teachers' digital competences, digital confidence and their mindset towards new technologies (European Schoolnet, 2013). However, the majority of today's teachers only feel sufficiently confident in administrative and basic digital tasks (e.g. producing text documents and sending emails), but far less confident with regard to more complex digital tasks such as programming or creating databases (Deloitte & Ipsos MORI, 2019). In short, European students are still taught by teachers who are neither sufficiently digitally confident nor sufficiently supportive (Conrads et al., 2017). The previously made research reveals that the overall digital teaching competence of academic staff in Latvia and Lithuania should be developed: on the one side, the university teachers obtained the optimal level of competence in media and equipment, media literacy and teaching staff motivation. On the other side, university teachers' competence that requires a specific professional knowledge in courses, didactics and instructional design, Learning Management Systems and e-moderation is of the low level (Grünwald et al., 2016). The digital competencies of the academic staff have become an essential tool in everyday work, and they are important not only in the study process, but also in the scientific research, communication and administrative work.

The main characteristics of Pedagogical Digital Competence (PDC) is the ability to develop/improve pedagogical work by means of digital technology in a professional context, primarily in web course/online teaching. University lecturers have great influence over their students' learning contexts, i.e., the contexts that guide the students in their study of a particular subject. Lecturers in higher education can influence and leave their mark in various ways on the courses they teach or coordinate. The ability to design courses is directly related to knowledge. In this connection, a knowledge of ICT-support is relevant and important. Are there digital technologies that might enhance the teaching and learning processes the students are involved in? ICT has dramatically changed our society, the contexts that young people are fostered into, what is learnt and how it is taught. In order to attain PDC it is not enough merely to understand concepts, be familiar with current research and to know what digital technologies are available. Skills are also needed, e.g., being able to use such technologies, meeting students where they are and giving them precisely the kind of support they need to progress. A person possessing PDC can support students in their journey towards achieving expected learning outcomes, understand how this process works and how it relates to regulating principles (From, 2017).

Today, it must be taken into account that students are the Z generation[†], who expects to acquire knowledge using ICT and digital tools, therefore, digital competencies of the academic staff must be at a high level. The conducted survey of the students who are going to become future managers and administrators, allows concluding that acquiring digital competences is, evidently, of crucial importance for their present and future professional activity

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[†] Often referred to as Digital Natives or the iGeneration. Gen Z starts from around 1996 till 2010 which means they are currently somewhere between 9 and 23 years old in 2020.

(Ashmarina & Mantulenko, 2020). Undoubtedly, the level of digital competencies of the academic staff and the use of digital tools in the study process have an impact on the digitization of society as a whole.

According to Digital Economy and Society Index (DESI) 2019 Latvia ranks 17th out of the 28 EU Member States. Latvia performs well in Digital public services and Connectivity thanks to the wide availability of fast and ultrafast fixed and mobile broadband networks and the increased take-up of e-government services. However, the Latvian business sector still scores below the EU average on the Integration of digital technology and also on the Human capital dimension. As regards Human capital, Latvia ranks 21st among EU countries and below the EU average, with indicators showing no relevant progress in the last few years. Although increasing numbers of Latvians are going online, basic and advanced digital skills levels remain well below the EU average. Only 48 % of people have basic digital skills (57 % in the EU as a whole) and the gap between Latvia and other EU countries is even wider for advanced skills (European Commission, 2019).

Regarding the business sector, the conclusions of the Latvian Information and Communication Technology Association's "Smart Latvia" campaign on the level of digital development of the enterprises of Latvia also confirmed the assumption that a large number of companies are not ready to work in the digital age. The majority - 41% - of the respondents of the Digital Maturity Test available at www.gudralatvija.lv admit that only a few basic digital solutions have been implemented in their company (LIKTA, 2020).

Scientific discussions on the assessment and development of digital competences have been topical since the beginning of this century. Improving digital competences has also become a priority for the European Union in the context of citizens' lifelong learning. Digital skills - alongside literacy and numeracy - are basic skills necessary for all sections of the population, but too many people have limited or outdated digital competences. There is a need for more comprehensive approach since all citizens have different levels of understanding of different aspects of digital competences, as well as there is a need for an in-depth approach to more specialized IT skills that are particulary essential in the ICT profession (European Commission, 2018).

The assessment of digital competences in all areas has become increasingly important, both in assessing the professional skills of employees and in developing curricula at all levels. An objective and widely used tool is essential for this purpose.

3. Methodology

Within the research there was developed a survey based on the Europass approach to the assessment of digital competences. The survey included 5 categories of digital competencies: information processing, content creation, communication, problem solving and safety. Respondents were asked to assess their competencies in each of these categories.

The survey was conducted in higher education institutions of the regions of Latvia by interviewing the elected academic staff. In general, there were collected 116 valid surveys from 24.04.2020 to 06.05.2020. The survey data represent the general population (Raosoft Samle size) with the probability of 95%.

4. Research outcomes

The survey was mostly completed by respondents whose education or occupation is not related to IT (71.6% - is not related to IT; 28.4% - is related to IT). The gender distribution of respondents is 54.3% women and 44.0% men. The distribution corresponds to the gender structure in Latvia, where the proportion of women is 54%, which confirms the representativeness of the sample. 1,7% - prefer not to say their gender. 32,8% was

respondents till 40 years and the same percent (32,8%) 41-50 years, 25,0% - 51-60 years and 9,5% - more than 61 years.

Figures 1., 2., 3., 4. and 5. show the respondents' self-assessment of their digital competencies.
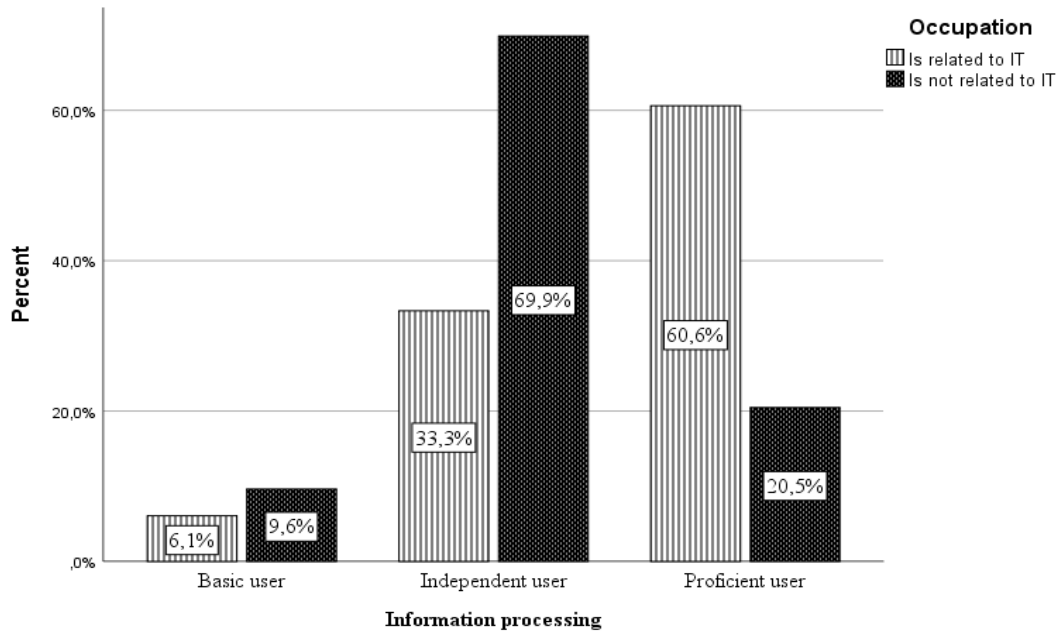
Fig.1. Respondent's self-assessment of information processing

Source: authors compiled

Figure 1 shows that the majority of respondents for whom education/occupation is not related to the IT field evaluate their information processing competence as an independent user (69.9%) and relatively many (20.5%) consider that they are proficient users. This competence is essential for academic staff to be able to provide students with the latest information they need, as well as for researchers to find relevant information in order to carry out high quality scientific research. According to the authors, there are a relatively large number of respondents whose occupation or education is related to IT, but according to self-assessment they refer to themselves as basic users (6.1%) and independent users (33.3%). This trend is also observed in other areas of digital competence assessment: content creation, communication, problem solving and safety. The assumption of the authors of the research in explaining these results is as follows - in accordance with the LR Cabinet of Ministers regulations No. 322 of 13.06.2017. "Regulations on the Classification of Education in Latvia", as well as on the basis of the research conducted by CERTUS think tank specialists on the ICT sector in Latvia, the field of IT studies includes the thematic study programmes of the fourth level of Latvian education classification code 48 "Computers" and a part of the fifth level codes of the study programme groups 523 "Electronics and Automation" and 526 "Other engineering sciences" (see Table 1) (Cabinet of Ministers of the Republic of Latvia, 2017; Spuriņš, Sjundjukovs, 2017).

Table 1. The fourth and fifth levels of the classification of Latvian education
(education thematic groups, thematic areas and programme groups) in the field of IT studies

Fourth classification level		Fifth classification level	
The third and fourth digit of the code	Thematic area of education	The third, fourth and fifth digits of the code	The group educational programmes
48	Computers	482	Use of computers
		483	Computer systems, databases and computer networks
		484	Programming
52	Engineering sciences and technologies	523	Electronics and automation *
		526	Other engineering sciences

* In the 523rd group of educational programmes "Electronics and automation" in accordance with the sixth classification level in vocational education there are included the sets of educational programmes as follows: 52301 Automation and computer engineering, 52302 Electronics, 52303 Telecommunications, 52304 Repair of computer equipment, 52305 Transport computer management, information and electronic systems.

Source: Cabinet of Ministers of the Republic of Latvia, 2017

Due to the fact that the respondents were not offered the opportunity to indicate the specific education/occupation, but only to indicate the connection of the education/occupation with the IT field, it means that the group of respondents who indicated that their education/occupation is related to the IT field could include also representatives of academic staff, for whom, for example, the education is actually related to "Electronics and automation" (which is also IT-related education). Thus, it suggests that IT education/occupation does not always automatically mean that a person can have digital competencies at the level of independent or proficient user.

Respondent's self-assessment of content creation is available in Figure 2.
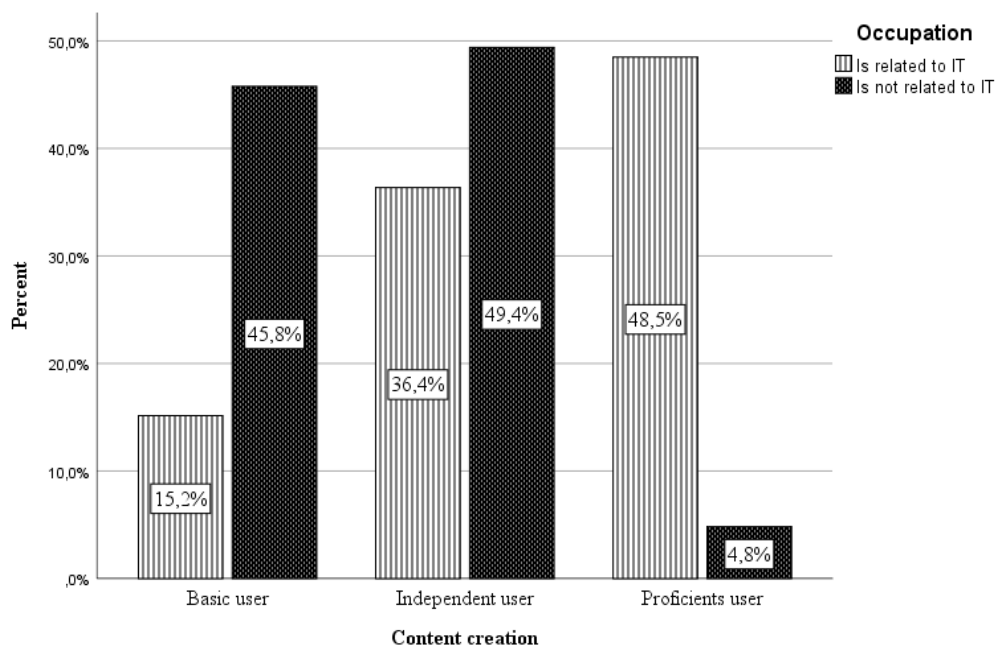
Fig.2. Respondent's self-assessment of content creation

Source: authors compiled

Figure 2 shows that almost equal respondents whose education/occupation is not related to IT believe that their content creation competence corresponds to the basic (45.8%) and independent (49.4%) user level. This shows that most academic staff know how to create simple content, such as gathering information from various sources, creating text, citing and creating references, images, charts, tables, formatting text, creating presentations, and much more. According to the authors, this digital competence is important both for the academic staff in the development of the study content and for the research staff in the research work in order to present the obtained research results in a way understandable to the audience, using various content reflection methods.

The average age of the academic staff in Latvia is one of the highest in Europe. According to OECD data, in 2017, in Latvia, the academic staff of higher education institutions aged 40+ accounted for 71.5%, while 47.4% of the total number of academic staff in higher education institutions of Latvia was represented by the staff aged 50+. The authors of the study note that the structure of the survey respondents is similar - 67.2% of them are aged 40+. This may explain why a relatively high proportion of respondents (45.8%) whose education/occupation is not related to IT have indicated that their digital requirements for content creation are at a basic level. Older adults have limited digital competences, for example, in 2017 in the EU there was on average 43% of people aged 55-64 with at least low digital competences (based on the ability to copy or move a file or folder) (ICTskills4All, 2019), thereby it can be assumed that the level of digital competences indicated in the survey directly depends on the age of the respondents. This assumption is also included in the hypothesis put forward in the research. In order to prove the hypothesis, a Chi-Square Test was performed at the end of the study, assessing the statistical independence between the age of the respondents and each area of the digital competences (see Table 4).

Respondent's self-assessment of communication is avalable in Figure 3.
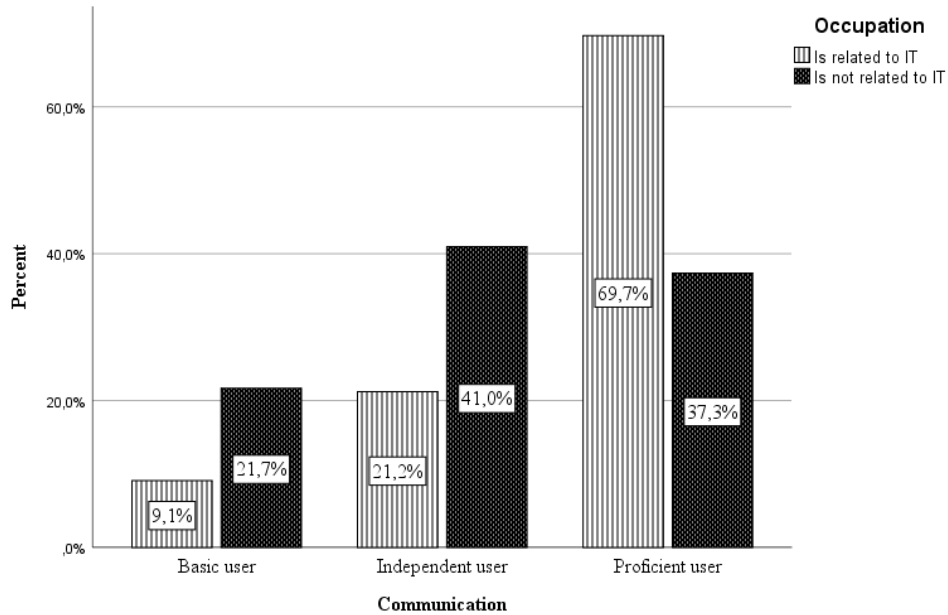
Fig.3. Respondent's self-assessment of communication

Source: authors compiled

Figure 3 shows that despite the fact that a large proportion of respondents who do not have a profession or education related to IT evaluate their communication skills at the level of independent user (41.0%) and slightly less as a proficient user (37.3%), however, relatively many respondents have assessed themselves as basic users (21.7%). The use of digital technologies in communication means the use of various communication tools (e-mail, social media, blogs, etc., online collaboration and file sharing tools) on a daily basis. The relatively high number of respondents (78.3%) whose education/occupation is not related to IT and who marked their communication competencies as an independent user or proficient user can also be justified by the restrictions caused by COVID-19, as a result of which the study process is organized in on-line mode, which promotes the need for academic staff to master a variety of platforms under the influence of external conditions.

Respondent's self-assessment of problem solving is available in Figure 4.
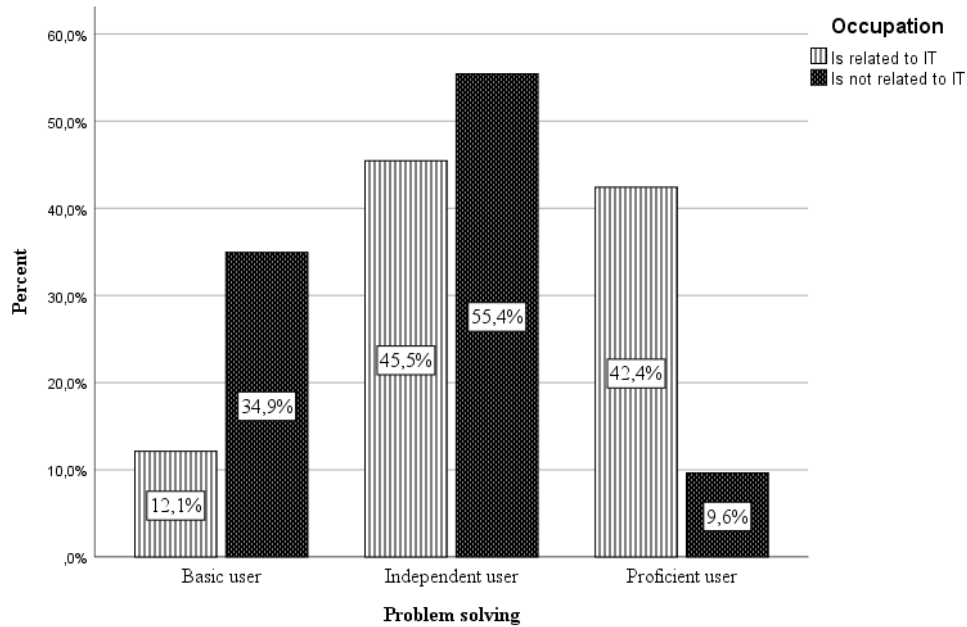
Fig.4. Respondent's self-assessment of problem solving

Source: authors compiled

Figure 4 shows that the majority (55.4%) of respondents whose occupation or education is not related to IT evaluate their problem solving competencies at the independent user level, while a relatively large number of respondents (34.9%) with education/occupation not related to IT rated their problem solving competence as a basic user. The authors of the study believe that this can be justified by the fact that higher education institutions usually employ IT specialists who are responsible for servicing computer equipment and monitoring its functionality. As a result, there is no need for academic staff to be able to solve all the problems connected with digital devices. The same can be said for academic staff who marked their education/occupation as IT related. Most of them (45.5%) rate their problem solving competencies at the independent user level, which means that they are able to solve uncomplicated technical problems on their own, such as updating software or checking the Internet connection.

Respondent's self-assessment of safety is available in Figure 5.
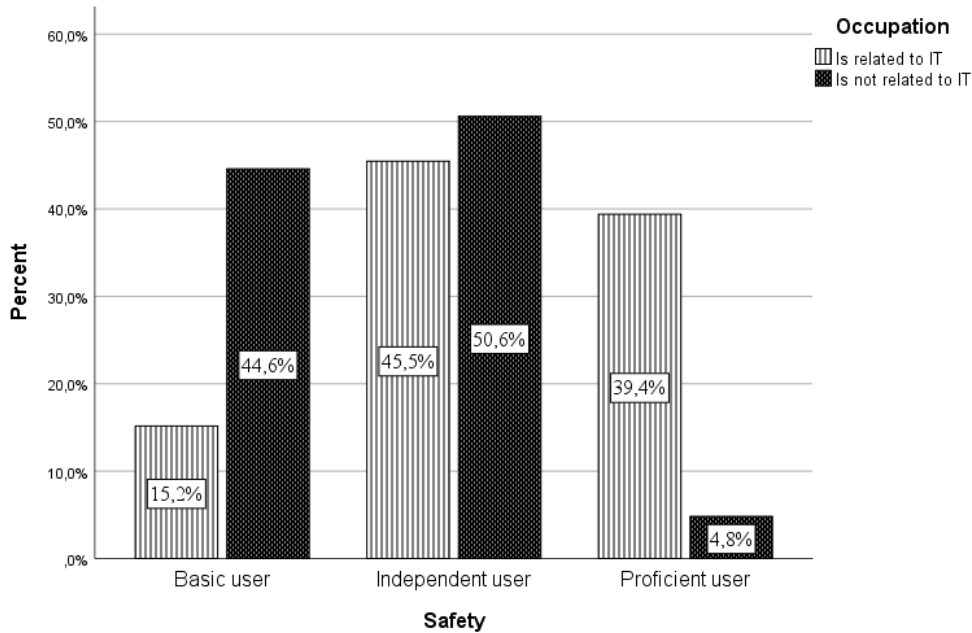
Fig.5. Respondent's self-assessment of safety

Source: authors compiled

Figure 5 shows that respondents' self-assessment of digital safety competence is very similar to problem solving. Digital safety competence means the use of various security programmes to protect the devices, safe use of the Internet (passwords, antivirus programs), adherence to the principles of personal data protection, as well as knowledge of the positive and negative effects of technology on health and the environment. The authors of the research are concerned about the relatively high number of respondents whose education/occupation is not related to IT and who assess their digital safety competence at the basic user level (44.6%). This means that they can recognize simple ways to protect their digital devices and content, distinguish simple risks and threats in the digital environment, choose simple means of protection and safety, and distinguish simple ways to protect their security and privacy that threaten not only academic work but also daily life. The authors of the research link it both with the age structure of the respondents and with the fact that the requirements of safe digital behavior have not still been fully accepted in society and the risks of non-compliance have not been identified (Bismart, 2020; Digital Security Alliance, 2017).

In general, it can be concluded that the majority of respondents whose education/occupation is not related to IT assess their digital competences at the level of independent users, however, in a relatively large number of cases they are at the level of basic users.
Respondents were asked what they thought was the best way to improve their digital competences. The responses are summarized in Figure 6.
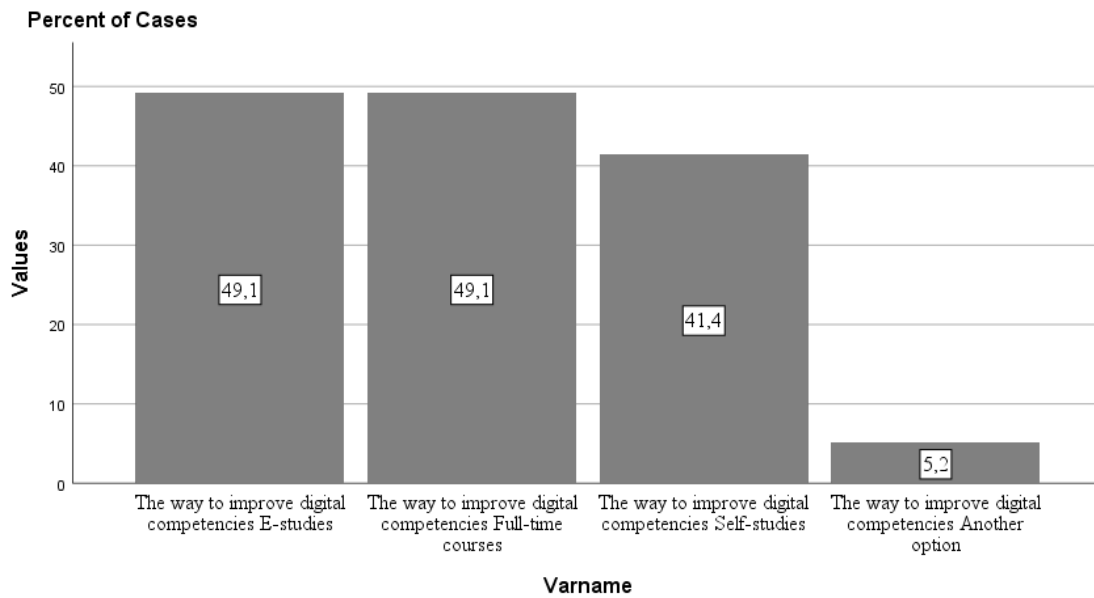
Fig.6. Respondent's answers about the way to improve their digital competencies

Source: authors compiled

Figure 6 shows that respondents' answers are evenly distributed (49.1%) between distance learning and full-time studies. This means that it is important for the interviewed respondents to gain new knowledge in the organized training process, where there is two-way communication between the lecturer and the learner. A slightly lower number of respondents chose to improve their digital competencies through self-studies (41.4%). 5.2% of respondents offered their vision of how to improve their digital competences, such as face-to-face individual classes with a lecturer.

Table 2 presents the information on the Cross-Tabulation Analysis carried out in order to find out how IT-related education/occupation influences respondents' choices regarding ways to develop digital competences.

Table 2. Cross-Tabulation Analysis of the impact of IT-related education/occupation on the ways to develop digital competencies

		Occupation/education	
		Is related to IT	Is not related to IT
Way to improve	E-studies	28,1%	71,9%
	Full-time courses	22,8%	77,2%
	Self-studies	41,7%	58,3%
	Another option	50,0%	50,0%

Source: authors compiled

Analyzing the information presented in Table 2, there can be observed significant differences between the answers provided by the respondents. It is clear that respondents who do not have an education/occupation related to IT prefer to improve their digital competences in the form of e-studies or full-time courses - 71.9% and 77.2%, respectively. The option of self-studies is marked as one of the least attractive (58.3%). It is logical that respondents who do not have an IT-related education/occupation choose the ways of developing digital competencies, where there is feedback and the opportunity to communicate with the lecturer. This cannot be

attributed to the respondents who have an education/occupation related to IT - in their opinion, the development of digital competences in the form of full-time courses is the least engaging way (22.8%), followed by e-learning (28.1%). The option of self-studies, by contrast, is marked as one of the most attractive way (41.7%). Interestingly, both groups of respondents equally marked another option as a way to improve their digital competences (50.0% and 50.0%, respectively).

Respondents were asked to express their opinion about the digital competences they need to improve. The responses are shown in Figure 7.
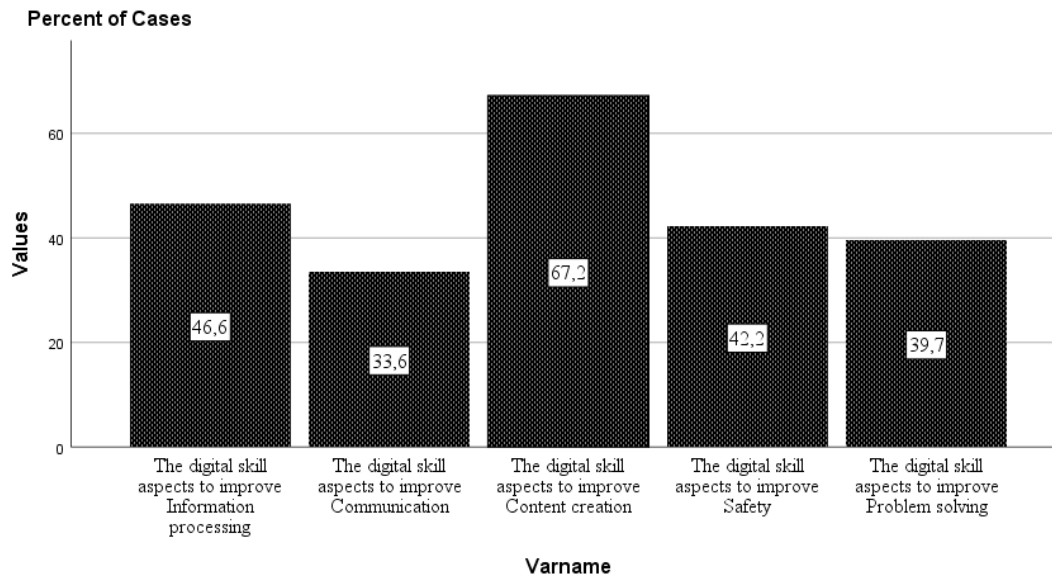
Fig.7. Respondents' answers to what digital aspects need to be improved

Source: authors compiled

Figure 7 shows that the majority of respondents believe that there is a need to improve content creation (67.2%) and information processing (46.6%). Taking into account the fact that the target audience of the survey is academic staff, these two competencies are essential in their daily work. Therefore, it is natural that these two competencies are marked as those that need to be improved.

Table 3 presents information on the Cross-Tabulation Analysis carried out in order to find out how IT-related education/occupation influences respondents' choice of categories of digital competences to be developed.

Table 3. Cross-Tabulation Analysis on the impact of IT-related education/occupation on the categories of digital competences to be developed

		Education/occupation	
		Is related to IT	Is not related to IT
What need to improve	Information processing	27,8%	72,2%
	Communication	23,1%	76,9%
	Content creation	23,1%	76,9%
	Safety	34,7%	65,3%
	Problem solving	28,3%	71,7%

Source: authors compiled

Analyzing Table 3, the authors of the research note that in this case, there are also sharp differences between the answers of the two groups of respondents. Respondents who do not have education/occupation related to IT have marked all digital competencies that need to be improved, respectively information processing - 72.2%, communication - 76.9%, content creation - 76.9%, safety - 65.3 %, problem solving - 71.7%. On the other hand, among respondents with IT-related education/occupation, among all digital competencies, which need to be improved, safety digital competence stands out the most, - 34.7%, but this indicator is twice lower than the second group of respondents' assessment of this digital competence. The authors of the research emphasize the interesting fact that it is safety digital competence that has the lowest value in the group of respondents who do not have an IT-related education/occupation, and the highest value in the group of respondents who have an IT-related education/occupation. This could be based on the data presented in Figure 5 - 15.2% of respondents with an IT-related education/occupation have assessed their safety digital competence at a basic level. However, despite the fact that 44.6% of respondents who do not have an IT-related education/occupation have assessed their safety digital competence at basic level, which is one of the highest indicators among all digital competences (the highest 45.8% is related to content creation), they have identified safety digital competence as the one that needs to be improved the least.

Within the research there were done calculations and determined statistical independence between the age of the respondents and each of the areas of digital competences (see Table 4). For this purpose, respondents were divided into 6 age groups (up to 40 years, 41-50 years, 51-60 years, more than 61 years).

Table 4. Chi-Square Test, assessing statistical independence between respondents' age and digital competences

Variables		Value	df	Asymp.Sig. (2-sided)
Information processing: Age group	Pearson Chi-Square	24,032	6	,001
Communication: Age group	Pearson Chi-Square	24,020	6	,001
Content creation: Age group	Pearson Chi-Square	21,136	6	,002
Safety: Age group	Pearson Chi-Square	47,155	6	,000
Problem Solving: Age group	Pearson Chi-Square	55,071	6	,000

Source: authors compiled

Analyzing the results presented in Table 4, it can be concluded that the probability of the chi-square test statistic was p = 0.000 or p = 0.001 or p = 0.002, less than the alpha level of significance of 0.05. Thus, we can state that the age group and each of the digital competence categories are interdependent features, which confirms the initial hypothesis that digital competences are directly dependent on the age of the respondents, i.e. elderly respondents have an insufficient level of digital competences.

The calculations established statistical independence between the respondents' IT-related education/occupation and each of the digital competence areas (see Table 5).

Table 5. Chi-Square Test, assessing statistical independence between respondents occupation/education and digital competences

Variables		Value	df	Asymp.Sig. (2-sided)
Information processing: Occupation	Pearson Chi-Square	22,483	2	,000
Communication: Occupation	Pearson Chi-Square	11,822	2	,000
Content creation: Occupation	Pearson Chi-Square	50,856	2	,000
Safety: Occupation	Pearson Chi-Square	37,334	2	,000
Problem Solving: Occupation	Pearson Chi-Square	24,737	2	,000

Source: authors compiled

The probability of the Chi-Square Test statistic (information processing: chi-square=22,483, communication: chi-square=11,822, content creation: chi-square=50,856, safety: chi-square=37,334, problem solving: chi-square=24,737) was p=0.000, less than the alpha level of significance of 0.05. Consequently, we can say that the occupation/education is or is not related with IT and each digital competence category are mutually dependent features.

Conclusions

Within the framework of the research, 116 representatives of academic staff from higher education institutions of the regions of Latvia were interviewed with the aim to obtain information about their self-assessment of the level of digital competencies. In total, digital competences were assessed in five areas: information processing, communication, content creation, safety and problem solving.

In the research it was found that the majority of respondents whose education/occupation is not related to IT rate their information processing skills as independent users and proficient users. Content creation and digital safety competences were rated the lowest by the respondents whose education/occupation is not related to IT. However, the digital competence of communication was rated at the highest level by the respondents in this group.

Respondents whose education is related to IT rated the level of their safety digital competence the lowest. In turn, the digital competence of communication was evaluated the highest by the respondents of the mentioned group.

As a result of the analysis, it was concluded that respondents whose education/occupation is not related to IT prefer to improve their digital skills in the form of e-studies or full-time courses. On the other hand, respondents who have an IT-related education/occupation are not interested in the development of digital competencies in the form of full-time courses and e-studies. Respondents in this group noted the type of self-studies as one of the most engaging.

Analyzing how IT-related education/occupation influences respondents' choices regarding digital competencies to be developed, it was concluded that it is safety digital competence that has the lowest value in the group of respondents without IT-related education/occupation and the highest value in the group of respondents with IT-related education/occupation.

In order to prove the hypothesis put forward in the research - the level of digital competences depends on the age of respondents - the Chi-Square Test was performed, assessing the statistical independence between the age of the respondents and each of the areas of digital competences. In the result of analysis, it was concluded that the age group and each of the digital aspects are interdependent features that support the original hypothesis.

Therefore, based on the results obtained in the study, the authors conclude that digital competencies of academic staff from higher education institutions of the regions of Latvia are directly dependent on the occupation/education related or not related to IT.

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Iveta MIETULE is the Professor at the Faculty of Economics and Management of Rezekne Academy of Technologies (Latvia), as well as Rector and director of study programs. She has the status of the expert of Latvian Council of Sciences in the field of economics. Research interests: accounting, higher education, human resources, regional development.
ORCID ID: https://orcid.org/0000-0001-7662-9866

Lienite LITAVNIECE is the Assistant Professor at the Faculty of Economics and Management of Rezekne Academy of Technologies (Latvia), as well as Head of project management and technology transfer contact point, director of study program. She has the status of the expert of Latvian Council of Sciences in the field of economics and management. Research interests: tourism product and development, food processing, regional development.
ORCID ID: http://orcid.org/0000-0001-9859-7850

Jelena LONSKA is the researcher at the Business and Society Process Research Center of Rezekne Academy of Technologies (Latvia), as well as an associate professor at the Faculty of Economics and Management. She has the status of the expert of the Latvian Council of Science in the field of economics. Research interests: regional economics, sustainable development, measuring the state of development of countries.
ORCID ID: https://orcid.org/0000-0002-8140-4810

Olga BUROVA is the Master of Humanities in Philology, guest lecturer at Rezekne Academy of Technologies (Latvia), as well as Headmistress of Rezekne Polish State Gymnasium. Research interests: secondary education, human resources, school management.
ORCID ID: https://orcid.org/0000-0003-0484-1985

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HOW WE CAN BENEFIT FROM PERSONAL FINANCE MANAGEMENT APPLICATIONS DURING THE COVID-19 PANDEMIC? THE POLISH CASE[*]

Krzysztof Waliszewski [1*], Anna Warchlewska [2]

Poznan University of Economics and Business, Al. Niepodległości 10, 61-875 Poznań, Poland

E-mails: [1] krzysztof.waliszewski@ue.poznan.pl (Corresponding author); [2] anna.warchlewska@ue.poznan.pl*

Abstract. The aim of this article is to determine if and to what extent sociodemographic factors are related to how home budget management applications are evaluated. The authors attempted to verify to what extent applications supporting personal finance management are beneficial and popular in Poland via a CAWI online survey. The architecture of the research covered the following areas: the name of the application used, its method of use, the level of complexity of the software installation process, evaluation of the application's transparency, intuitiveness, functionality, if it meets financial needs, the technical and substantive faults of the application, degree of satisfaction with the application as well as recommendations for further development, the advantages and disadvantages of the application, the use of PFM during the SARS-CoV-2 era. The study showed that users tend to use non-banking applications more often than financial managers offered by banks. A PFM benefit analysis shows that the applications are highly transparent, structured, intuitive and that the respondents have positive approach towards using them. The SARS-CoV-2 pandemic has given grounds to finding gaps in remote customer service, such as better adaptation to the needs of current settlements and payments, the incapability to scan documents, and the lack of advice and ongoing contact with a consultant.

Keywords: modern financial technologies; Personal Finance Management; FinTech; pandemic SARS-CoV-2

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1. Introduction

The growing popularity of mobile applications forces the banking sector to look at the market more broadly and to cooperate with the FinTech industry. In order to be able to compete with external entities for the user of their applications, banks must implement more advanced personalisation strategies to facilitate more targeted marketing and product development using artificial intelligence (Alt et al. 2018; Nicoll 2019).

The effectiveness of using artificial intelligence (Belanche et al. 2018) in various aspects of the economy has been a topic of discussion for many years now. The speed with which users implement and adapt new technological solutions depends on the level of sophistication offered by financial services in a given country. Each financial institution struggles with data overload and the problem of processing and selecting the most relevant. Thanks to technology, robotisation and artificial intelligence, it becomes possible to personalise customer service and switch to remote service channels. The application of modern financial solutions not only serves to minimise the costs associated with employment, but also to target action on the complex problems faced by customers (Javaria et al., 2020). Robotics and artificial intelligence (Xie, 2019) both significantly influence the financial industry, as the technology used there is a key element in the strategy of banks and emerging financial entities (Baker & Dellaert 2017; Jung et al. 2018). Replacing traditional consultancy services with innovations, especially at the beginning, is not met with much enthusiasm, mainly due to the novelty factor, competition, fear and lack of knowledge (Belanche at al. 2019).

Improvements in the management of home finances can be made using appropriate tools. The desire to use modern solutions is associated with the need to choose the right software, purchase a license or install applications on a mobile device. The form of using PFM tools depends on the consumer's preferences and/or the form of making them available to the users offered by the provider. Combination of advances in technology, new uses of data, and changes in customer preferences and expectations are likely to create lasting structural changes in financial services (Xiao, Tao, 2020) like credit, digital payments, savings, investments & PFM, distributed ledger technology) (Marder, 2016); legislation (Artemov et al., 2020).

The key impetus behind the development of solutions based on traditional banking services is the PSD2 directive. Opening up financial institutions to third parties may provide a basis for building new solutions and business strategies, mainly in order to offer clients innovative solutions (EU Directive 2015/2366). Implementation of the PSD2 (Payment Services Directive 2) directive enables financial data to be imported and exported from clients' accounts at various banks and to register financial transactions, group, aggregate and visualise financial events (Gafrikova et al., 2015). One of the regulatory challenges in terms of sensitive data processing is the outsourcing of critical functions. The use of cloud solutions may adversely affect the sense that one has control over the personal data of the entities that commission the creation, implementation and service of, *inter alia*, PFM applications to third parties. It is important to maintain a sense of control over the data and to ensure the effective removal of data from the cloud at the end of a contractual period (EIOPA-BoS-20-002).

Bearing in mind the growing importance of modern financial technologies and entrenched social isolation, entailing the need to remotely manage the home budget during the SARS-CoV-2 pandemic, the study undertook an analysis of the functionality, attitudes and expectations of polish customers regarding the use of financial applications. The aim of this article is to determine if and to what extent sociodemographic factors are related to the how home budget management applications are evaluated. In order to achieve this research goal, a nationwide CAWI online survey was carried out in the period from 01/08/2020 to 30/09/2020 and 301 statistically significant responses were obtained. The architecture of the research covered the following areas: (a) the name of the application used, (b) its method of use, (c) the level of complexity of the software installation process, (d) evaluation of the application's transparency, (e) intuitiveness, (f) functionality, (g) meeting financial needs, (h) the technical and substantive flaws in the application, (i) degree of satisfaction with the application and

recommendations, (j) advantages and disadvantages of the application, (k) use of PFM in the times of SARS-CoV-2.

2. Theoretical background

Digital technologies are increasingly integrated in the economy and making a significant impact in the financial industry by introducing new products, services and providers. Digitalisation is affecting individuals and businesses globally, with mobile money services now available in 64% of developing countries (GSMA 2019), and their spread is likely to increase hand in hand with the growing penetration rate of mobile connections. These changes increase the demand for financial education, financial consumer protection and financial inclusion policies (OECD 2018; Kirillova et al. 2019; Abad-Segura et al. 2020).

Customer self-services enables a new service model to be created that bases its assumptions on the equal involvement of investors and bidders in the financial management process and can influence the establishment of long-term relationships between the parties involved (Djelassi et al. 2018). Most financial institutions do not take advantage of customer self-service potential because they base their assumptions on an incomplete business model in the area of remote service. Remote financial management support services are focused on the speed of response to reported needs, reducing service time, convenience for customers and lowering costs for the service provider (Boon-itt 2015). Innovation in finance may go hand in hand with consumer discomfort arising from lack of control over modern tools, uncertainty of their knowledge and skills, lack of confidence in technology and a sense of technological overwhelm (Parasurman 2000).

The shift in consumer preferences and online activity results mainly from forced, social isolation. The lack of data on the distribution of popularity of financial applications offered by third parties and banks does not allow us to conclude whether the increasing popularity of applications may have an impact on the evolution of banks' business models. Moreover, the uncertainty of the fintech market is growing. Fintech (or lendtech) companies, which offer assistance in automating contract signing procedures and optimising internal processes, are also likely to survive post-crisis. Traditional loan and wealth management companies may find themselves much more turbulent water, as demand for such services is in decline (Blue Media 2020; Fintek 2020).

Significantly, the innovation market is currently passing through regulatory sandboxes. It should be realised that financial technological innovations are just the beginning of creating products or services that require effective regulatory adjustments through the use of artificial intelligence, distributed ledger technology, blockchain or big data analysis and processing. To this end, test programs ('regulatory sandboxes') enable products and services to be tested in a controlled environment, strive to speed up the process of product introduction (with potentially lower costs), support security in the area of consumer protection and boost opportunities to access financing for innovation (Financial Conduct Authority 2020).

The Basel Committee on Banking Supervision categorised innovation in technology (Thakor 2019). The development of the FinTech industry affects the four major areas of financial services: credit and savings, payment and settlement, investment, and insurance, which are all components of the financial planning process (Waliszewski 2014). The PFM application market is divided into applications offered by financial institutions from the banking sector and applications offered by external entities (non-banking, community). Mobile applications on the global markets that help to manage personal finances are especially aimed at the young generation that is entering adulthood. They are characterised by a modern approach in terms of graphics, functionality and availability for smartphones of different generations. It should be noted that developers of available applications on the market compete with each other in terms of usefulness of their programs and their functionality. They are undoubtedly connected by a practical dimension, which in the case of the subject of finance is extremely important. The financial sector is facing the changes that result from technological

developments (Omarini 2018). The implementation of advanced IT systems, business events and data collection and processing is an opportunity for the banking industry to improve profitability and customer relations. Cooperation on the use of PFM from the worlds of business and science is also essential, as demonstrated by research already carried out in this area (Table 1). Research activities have been intensifying since 2012, both in the field of cognitive consumer behaviour and the tools used to support the process of personal finance management.

The literature on the subject defines the criteria for assessing the quality of financial applications (mobile and websites). The most important areas include: reliability, usability and functionality. Functionality is understood as the availability of a function that can be measured by means of defined requirements, the capability to interact with other systems, the maintenance of security standards and accuracy of results achieved. Reliability is the capability of a website or application to operate efficiently under certain conditions. Among others, this is characterised by tolerance of errors, the site's ability to return to normal operation, and the frequency of failures.

Table 1. Selected research on PFM in Poland and worldwide

Year	Author of the study/report	Subject of the study	Main conclusions of the study
2009	F. Philip, M. James, E. Joorgen; Cisco Internet Business Solution Group (IBSG)	Financial priorities for banking services and preferred forms of customer contact with the bank	Financially active consumers and those using PFM applications rarely migrate from bank to bank. They have higher bank account balances and use a wider range of products and services.
2012	Employee Benefit Research Institute and Mathew Greenwald &Associates, Inc.Retirement	How do consumers manage their finances online? (convenience analysis)	Only a small proportion of consumers of working age and post-working age have a positive view of the use of Internet technologies to manage their finances. Among active website users: 4 out of 10 employees and 1/3 of retired people declared that they feel very good about keeping accounts through online calculators. Less interest is observed in the area of online specialist advice.
2012	M. Musiał University of Szczecin	To what extent do Polish households use basic personal finance management tools? (creating a household budget)	Polish households use personal finance management tools to a small extent. However, the most popular tool is the household budget prepared in the traditional form (card and paper). The relationship between the use of personal finance management tools and education was indicated (the percentage of people using these tools increases with the level of education).
2013	Javelin Strategy & Research	Research on consumer expectations of PFM	Respondents in 56% declared that they would be willing to use PFM tools in their basic account. The use of remote tools will have an impact on the constant supervision of the budget, allow for forecasting and planning. American consumers declared that they would like to be able to aggregate all financial data in one application. Banks should focus their attention on personalization of advice, alerts.
2013	A. Barembruch University of Gdansk	Differences between classic and modern personal finance management tools. Disadvantages and advantages of PFM.	The competitive advantage of banks which already implement PFM systems in Poland as part of online banking may be undermined when the services offered within a given bank will only concern products offered within that bank.
2016	M. Heikel-Elsabeh, S. Nouet, M. Nayaradou	Use and application of PFM applications for personal and corporate finance management.	The use of PFM applications depends on the purpose and application of the tools. Consumers who use mobile solutions more intensively prefer to use applications offered by external entities instead of banking applications. Users emphasise the complexity of non-banking tools.

2017	Chamber of Electronic Economy/Mobile Institute	Pole's wallet: Analysis of expenditure and payment methods	The use of banking services was declared by 80% of Internet users, of which 28% use the classic bank account management channel, 36% choose the Internet service, 36% choose the bank's mobile service. The Polish consumer presents himself as a pragmatic and open to innovation financial market participant.
2017-2018	A. Samsel University of Szczecin	Personal finance planning. Information obtained from households.	Households do not run the household budget for the most part (they do not manage their income in a planned manner). Households (head of household) have declared that they have their budget under control and do not have to plan regularly. Moreover, according to the respondents, managing the budget takes time - this is a disincentive.
2018	Aite Group	Construction/reconstruction of personal finance management. Tasks for banks.	About 75% of respondents aged 22-49 indicate that they are interested in using a virtual financial coach. An opportunity for banks is to use artificial intelligence to provide tools to support the financial management process. Banks should strive to implement an interactive tool that will help consumers take control of their financial condition.
2020	Waliszewski Krzysztof, Warchlewska Anna Poznan Univeristy of Economics and Business	Personal Finance Management (student's point of view), Robo-advice	The results of a survey conducted among students of the University of Economics in Poznań indicate that financial applications offered by institutions that are not banks are extremely popular. In addition, the pandemic period highlighted technical and substantive gaps in applications such as the need to update functionality regarding remote contact with the user for ongoing settlements and payments, advice and ongoing contact with a consultant and remote assistance in formalities concerning loans and deposits. According to the respondents, PFM applications support the process of financial management and saving money, which they found valuable in terms of enhancing economic and financial knowledge as well as financial skills. Within the scope of the first robo-advice user survey in Poland, it should be indicated that the type of investment strategy used, the ethicality evaluation, development prospects, and opinions on robo-advice are viewed positively and investors are satisfied with robo-advice.

Source: Own elaboration based on: Farah, Macaulay, Ericsson 2010; Uryniuk 2012; RCS 2012; Musiał 2015, aleBank.pl 2013, Barembruch 2013; Haikel-Elsabeh, Nouet 2016; eIzby Report 2017; Samsel 2019; Albertazzi 2018, Waliszewski & Warchlewska, 2020a and 2020b.

Usability, on the other hand, is understood as the accuracy of the user interface construction, which is based on efficiency, satisfaction, rememberability, resistance to errors and speed of learning (Nielsen 2012). Examples of non-banking applications are presented in table 2.

Table 2. Selected non-banking PFM

Non-banking applications	You Need a Budget, Kontomierz, Money Lover, Kwitki, Wallet, Fuelio, Billy, Mój protfel - MyMoneyTracek, Pan Paragon, Szybki Budżet, Mint, Quicken, Robinhood, Prism, Spendee, Monefy, Personal Capital, Birch Finance Acorns, Twine, Bilo, BillTech, BillBook, Cashap, Comperia.pl, Comapre King.pl, Goodie, Google Pay, Apple Pay, Samsung Pay, Xoom, Circle Pay, Venmo, Square Cash, Zelle, Facebook Messenger, Nice Pay, Kekemeke, Lepsza Oferta.pl, Peyt, Strands, Kalkulator spalania paliwa, Guilt - Expense Manager, Garmin Pay, Skarbnik, Monefy- Menedżer finansowy , ShuCash, ePortfel, PNC Virtual Wallet, My Portfolio, Cashcontrol.pl, Figgy.pl, ifin.pl, Tu cuentas, Money Manager, Mis Finanzas, Eazzy Banking, iFIN24, fin4Family, Moneyspire, Moneydance, moneyZOOM, wxBanker, payZZER, Ace Money Receipts, Microsoft Money
Non-banking applications (in social media)	Bank blogging, microblogging, bank Internet fora, wiki websites, crowdsourcing, Web syndication, podcasting, Web widgets, folksonomy and tag clouds, social bookmarking, social media services (Facebook, Youtube banking)

Source: own elaboration.

Polish consumers of financial services are very interested in using solutions typical for open banking (a characteristic feature of open banking is transparency in access to financial data and freedom to manage them), 48% of them would like to use an application that allows them to manage accounts in different banks, and 25% of them would like to use an application that allows them to plan their expenses based on transaction history from different sources. Moreover, 24% of respondents would like to use financial services that offer far-reaching personalisation, based on data from their accounts in different institutions. As the number of financial service providers increases, cooperation between different financial entities is essential. According to the Mastercard survey (Mastercard 2020) on digital banking - *European Digital Banking Survey*, May 2019 - 94% of Poles surveyed believe that such partnerships are an immanent element for creating innovations in finance, and 26% believe that this cooperation will intensify in the future. Mastercard has been supporting the process of digitisation of the financial sector and cooperation between large institutions and the FinTech sector for years. The market of applications[†] supporting the process of personal finance management is surging, especially on the Polish market, as evidenced by the awards for IKO PKO Bank Polski S.A. for the best banking application in the world appreciated by the British service Retail Banker International. The PeoPay application of Bank Pekao S.A. was recognised in 2018 in the EFMA Accenture Distribution & Marketing contest for the best innovation in the world.
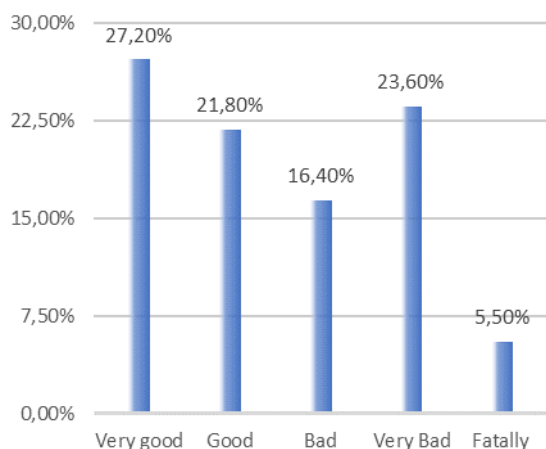
Figure 1. Impact of the COVID-19 pandemic on FinTech companies in Poland in 2020.

Source: statista.com, 2020.
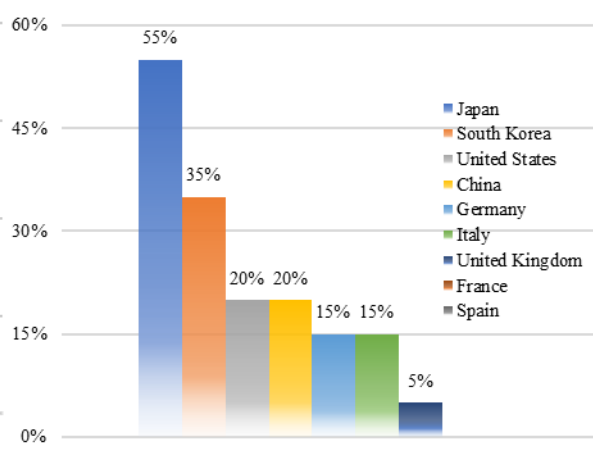
Figure 2. Increase in the average weekly use of financial applications during the COVID-19 pandemic in selected countries from 29 December 2019 to 1 March 2020 (Android phones only).
Source: statista.com, 2020

The SARS-COV-2 pandemic is changing the way many financial institutions and fintech companies operate. Consumer behaviour is changing and the old risk assessment models no longer work. Banks are responding to the crisis related to the COVID-19 pandemic with new technologies (Ozili 2020; Wójcik & Ioannou 2020, Solarz&Waliszewski 2020). Mobile applications and alternative payment methods (also using biometric technology) are gaining popularity. Analysis of the instant payments market via Blue Media (2020) indicates that during the pandemic the amount of fast internet payments rose from 41% to 48%, card payments from 32% to 39%, with a noticeably growing interest in BLIK transactions from 24% to 33%. The coronavirus pandemic resulted in a clear reversal of cash on delivery (from 46% to 24%), automatic bank transfers (from 43% to 34%) and cash upon receipt (from 16% to 9%). This relentless buzz of consumer activity on the mobile payments market conveyed no financial benefits upon the fintech industry. Due to the crisis caused by the coronavirus pandemic in the first quarter, investors interested in the fintech industry began to withdraw (Fintek 2020). On the

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[†] The analysis of selected applications was based on websites and applications of SWF services.

other hand, market data on the continuation of cooperation between the fintech industry and banks show that almost 49% of companies assessed that the pandemic has had a positive impact on their operations in 2020 (Fig. 2).

According to the data, the average weekly use of fintech applications in Japan increased by 55%, which coincides with the onset of the COVID-19 pandemic. In contrast, in Spain, France, there was no increase in the average weekly time spent by users remotely managing their finances.

3. Methodology

The first study of PFM application users in Poland was nationwide and conducted on a group of $N = 301$ people, 288 of whom admitted using applications that assist budget management, while 13 people did not use such applications. The questionnaire was made available on financial portals, including Bankier.pl and financial blogs.
Among those who did not use the application, there was an even distribution in terms of sex and age, while the majority were working people with higher education, usually living in larger towns, from high income households of 2-3 persons.
The study group mainly consisted of men (66.67% of the respondents), and people aged 26-35 (42.36%). People with higher education accounted for 74.65% of the study group, and in terms of employment, most people work (79.44%).

Table 3. Characteristics of the studied group in terms of sex, age, education and professional situation

		Does not use an application		Application users	
		N	*%*	*N*	*%*
Sex	Women	7	53,85%	96	33,33%
	Men	6	46,15%	192	66,67%
Age	19-25	2	15,38%	78	27,08%
	26-35	4	30,77%	122	42,36%
	36-50	4	30,77%	84	29,17%
	Over 50	3	23,08%	4	1,39%
Education	Secondary	2	15,38%	73	25,35%
	Higher	11	84,62%	215	74,65%
Professional situation	Student	1	8,33%	50	17,42%
	Working	11	91,67%	228	79,44%
	Retired	0	0,00%	1	0,35%
	Unemployed	0	0,00%	8	2,79%

Note: N- number, % percentage

Most respondents live in cities with over 500,000 inhabitants (41.61%), usually in households of 2-4 persons and with a high per capita income.

Table 4. Characteristics of the studied group in terms of place of residence, number of people in the household and income

		Does not use an application		Application users	
		N	*%*	*N*	*%*
Place of residence	Village	1	7,69%	50	17,48%
	Town below 50,000 residents	2	15,38%	46	16,08%
	Town between 50,000 and 150,000 residents	2	15,38%	25	8,74%
	City between 150,000 and 500,000 residents	7	53,85%	46	16,08%
	City above 500,000 residents	1	7,69%	119	41,61%
Number of people in the household	1	2	15,38%	52	18,12%
	2	4	30,77%	73	25,44%
	3	4	30,77%	60	20,91%
	4	2	15,38%	73	25,44%
	5 or more	1	7,69%	29	10,10%
Average per capita income (net) in the household	Less than 1000 zł	0	0,00%	9	3,23%
	1001-2000 zł	0	0,00%	33	11,46%
	2001-3000 zł	4	30,77%	56	19,44%
	3001-4000 zł	3	23,08%	66	22,92%
	4001-5000 zł	2	15,38%	35	12,15%
	5001 zł or more	4	30,77%	80	27,78%

Note: N- number, %- percentage

The following research hypotheses were formulated:

H1: Gender would be statistically significantly associated with the assessment of application errors (more often noticed by women), the probability of giving a recommendation (more often recommended by women) and the assessment of how the application impacts budget management during self-isolation (mainly men).

H2: the age of the respondents would be statistically significantly associated with the likelihood of recommending the application to a friend, with the applications being recommended most often by people over 50, and least often by those aged 19-25.

H3: place of residence would be statistically significantly associated with the evaluation of how well the application is organised, willingness to use it, and satisfaction with its use.

H4: the level of per capita household income would be statistically significantly related to the assessment of transparency and organisation of the application, satisfaction with its use and willingness to recommend it.

H5: higher education would be linked with more frequent use of the mobile application. Also, people with higher education would rate the transparency and organisation of the application higher, along with its user-friendliness.

H6: the type of application used would be statistically significantly associated with the assessment of how complicated the application is to install, its organisation, satisfaction with its use and willingness to recommend it.

The following statistical methods were used to analyse the results obtained: Pearson's Chi-squared test, and Cramer's V to test the strength of the relationship.

4. Results

Most of the respondents used non-banking applications (87.50%). The most frequently mentioned were Kontomierz (15.28%), YNAB (15.28%), Spreadsheet (9.38%), 1Money (6.94%) and Family Finance Tracker (6.60%).
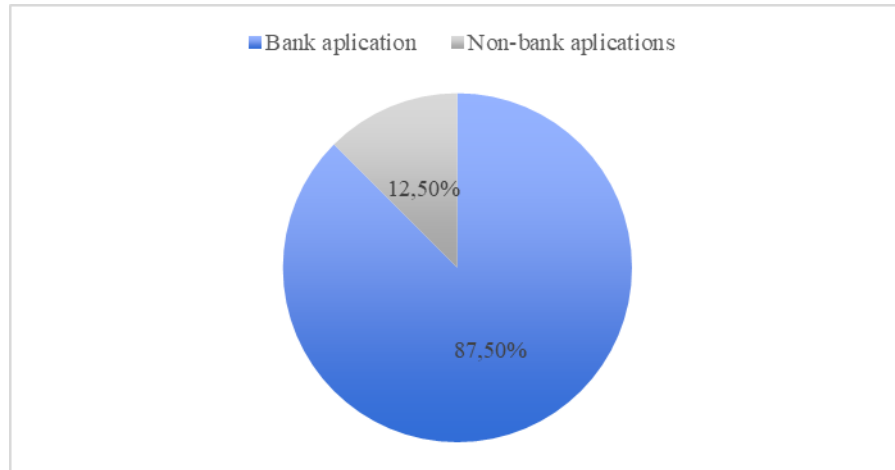
Figure 3. Type of applications used.
Source: own elaboration.

The main mentioned benefit of using an application was control over expenses (91.01%), followed by developing the habit of saving (71.53%), supporting financial decisions (55.21%) and financial security through ongoing control of the bank balance.

In terms of shortcomings, the respondents mentioned the application's inability to make transfers and integrate with their bank, to establish sub-budgets, to scan documents, as well as the lack of exchange rates.
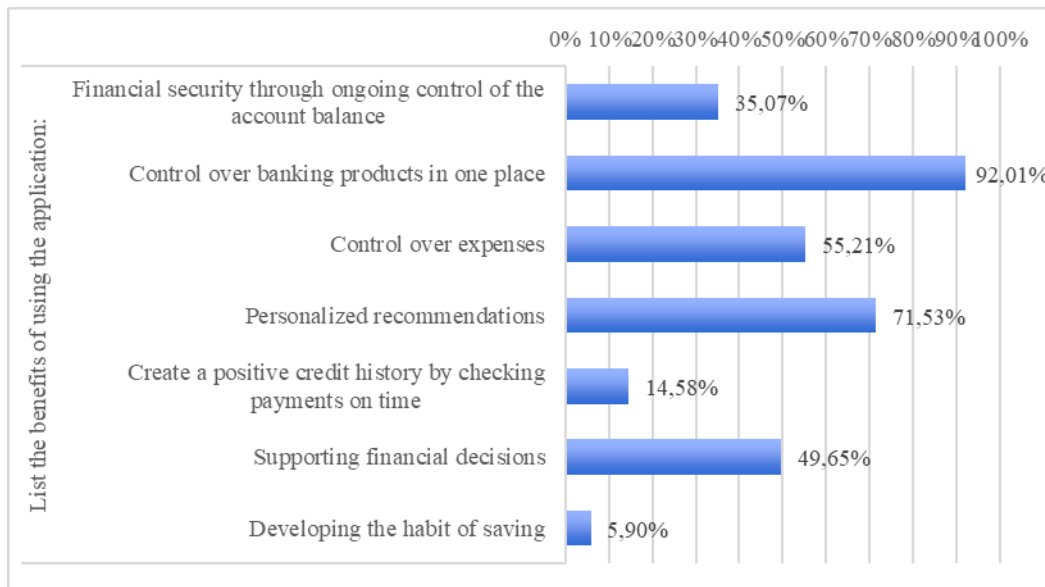
Figure 4. Evaluation of the benefits to be gained from using an application.
Source: own elaboration.

The respondents usually believed that the application helped them manage their finances in a context of self-isolation, quarantine and remote work.
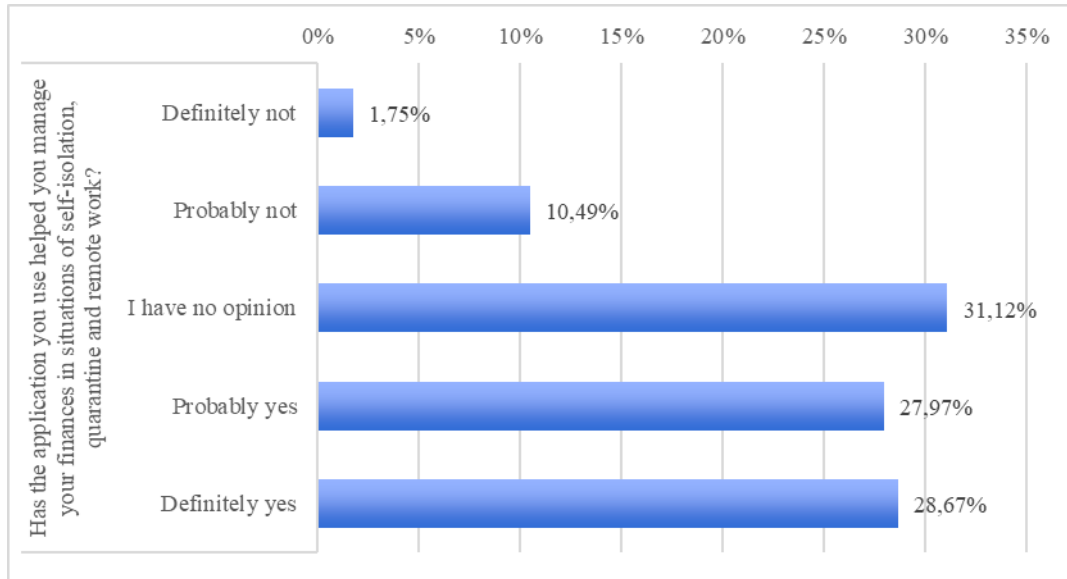
Figure 5. Using applications in times of self-isolation.
Source: own elaboration.

According to the respondents, when it came to a pandemic situation, current settlements and payments (47.80%), followed by sending scanned documents (29.67%) and consultant's advice (28.02%) were all areas that needed to be upgraded and better matched to user requirements.
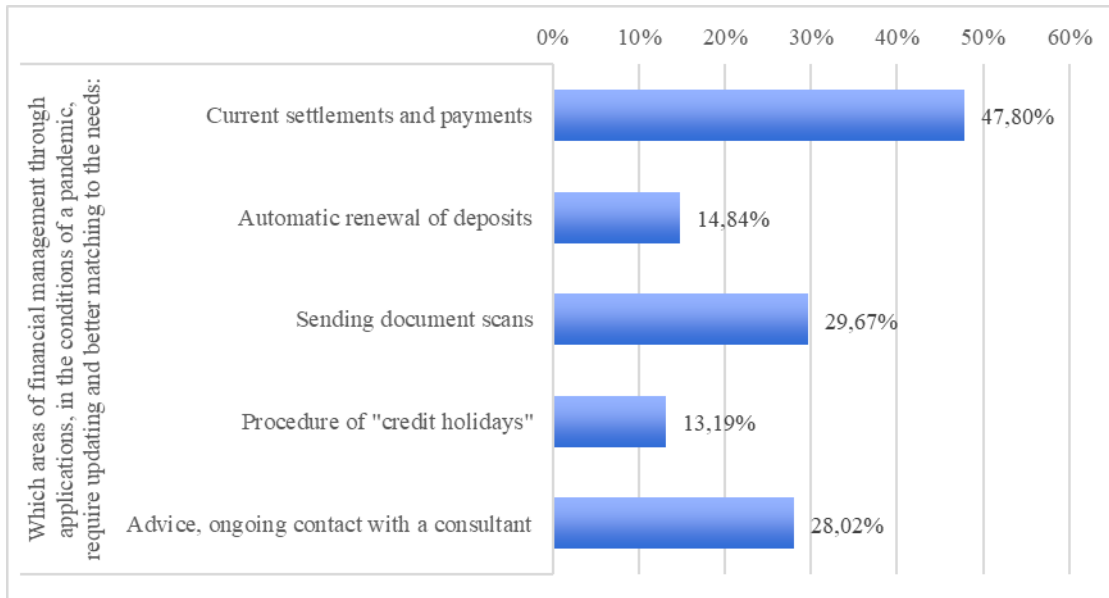
Figure 6. Evaluation of the possibility to improve applications.
Source: own elaboration.

The Covid-19 pandemic most often affected the respondents by cutting back their income (32.99%) and reducing their savings (25.69%). 17.71% of people declared that the pandemic had had no impact on their home budget.
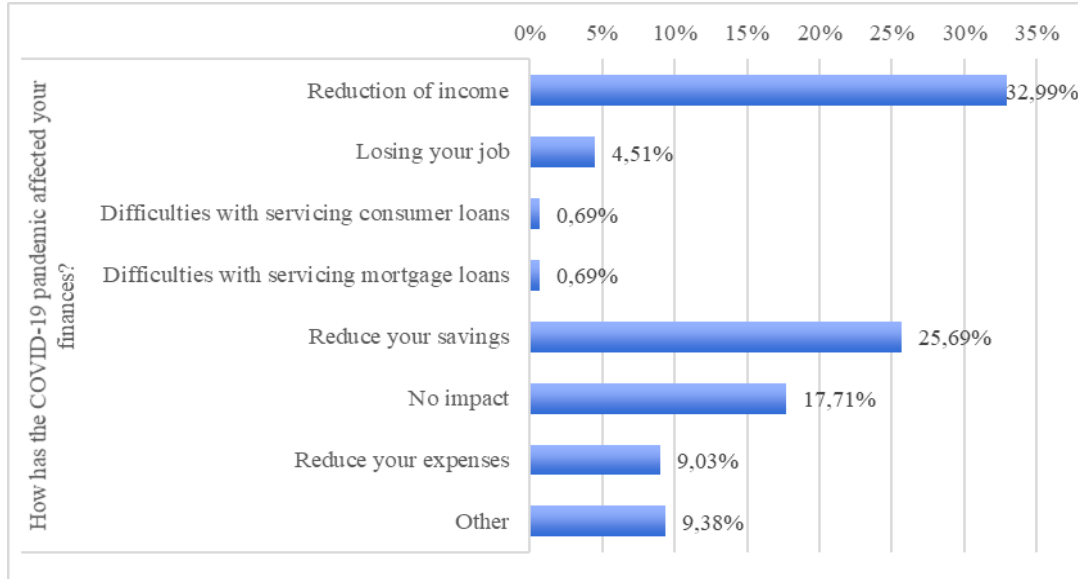
Figure 7. Impact of the pandemic on finances.
Source: own elaboration.

Further, the aim of the study was to determine, *inter alia*, whether and to what extent sociodemographic factors were related to how a home budget management application was evaluated. For this purpose, a series of analyses was performed using Chi-squared tests.

Table 5. Results of Chi-squared test analyses of the relationship between how home budget management applications are rated and gender

Sex	χ^2	df	p	V
How can you use the application?	1,43	2	0,489	0,07
How complicated was it to install?	3,91	3	0,271	0,13
The application you use is transparent:	4,79	5	0,442	0,13
The application you use is organised:	9,24	4	0,055	0,18
The application you use is user-friendly:	4,02	4	0,404	0,12
Is the application intuitive and the functions easy to remember?	4,47	4	0,347	0,13
Does the application have any flaws?	**8,39**	**2**	**0,015**	**0,17**
Rate your satisfaction with the application.	11,59	8	0,171	0,20
How likely are you to recommend the application to a friend?	**21,59**	**9**	**0,010**	**0,27**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	**11,71**	**4**	**0,020**	**0,20**

Notes: χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

The first series of Chi-squared analyses indicated that in the study group, gender was statistically significantly linked with the evaluation of application flaws χ^2 (2) = 8.39; $p < 0.05$; $V = 0.17$, the likelihood of recommending it χ^2 (9) = 21.59; $p < 0.05$; $V = 0.27$ and how the impact of the application on budget management in the situation of self-isolation was assessed χ^2 (4) = 11.71; $p < 0.05$; $V = 0.20$.

In the study group, women (9.38%) noticed errors in the budget management application demonstrably more often than men (7.89%). Women also expressed that they would be less willing to recommend the application to their friends, scoring an average of $M = 8.05$ on a 1-10 scale, while men scored $M = 8.43$. Men, on the other hand,

were more often of the opinion that an application helped them manage their finances in the context of self-isolation, quarantine and remote work. However, these relationships were not strong.
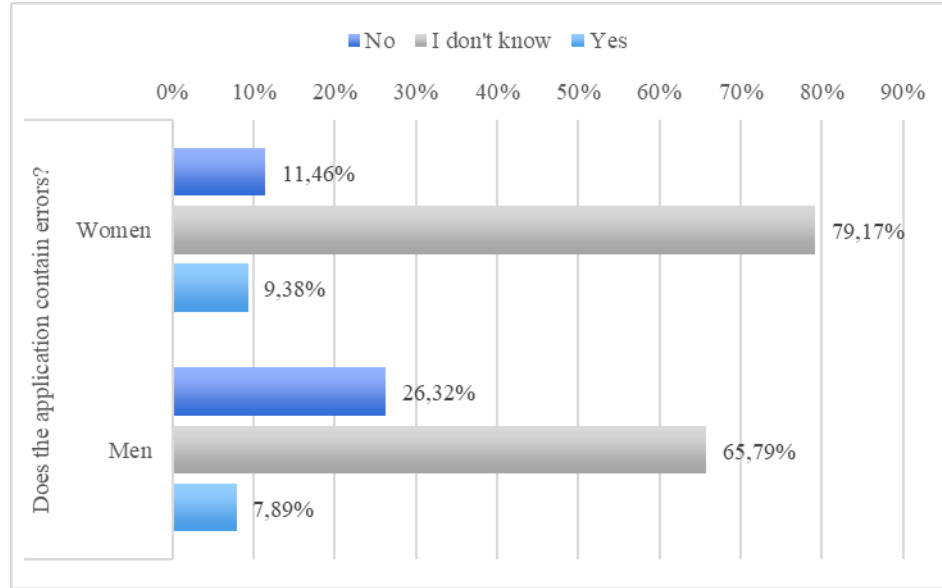
Figure 8. The relationship between the evaluation of flaws in the application and gender.
Source: own elaboration.

The next Chi-squared analysis examined the relationship between the assessment of home budget management applications and age.

Table 6. Results of Chi-squared analyses of the relationship between the assessment of home budget management applications and age

Age	χ^2	df	p	V
How can you use the application?	11,23	6	0,082	0,14
How complicated was it to install?	9,65	9	0,379	0,11
The application you use is transparent:	19,86	15	0,178	0,15
The application you use is organised:	20,22	12	0,063	0,15
The application you use is user-friendly:	8,38	12	0,755	0,10
Is the application intuitive and the functions easy to remember?	11,87	12	0,456	0,12
Does the application have any flaws?	11,93	6	0,064	0,14
Rate your satisfaction with the application.	29,13	24	0,215	0,18
How likely are you to recommend the application to a friend?	**40,52**	**27**	**0,046**	**0,22**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	12,98	12	0,371	0,12

Notes: χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

It was only demonstrated that the age of the respondents was statistically significantly associated with the likelihood of recommending the application to a friend $\chi2$ (27) = 40.52; p <0.05; V = 0.22. The highest probability of recommending the application to friends was expressed by people aged over 50 M = 9.00 and the lowest by people aged 19-25 M = 7.92.

Table 7. Results of Chi-squared analyses for the relationship between how high home budget management applications were rated and education

Education	χ^2	df	p	V
How can you use the application?	**16,22**	**2**	**0,000**	**0,24**
How complicated was it to install?	2,71	3	0,439	0,10
The application you use is transparent:	**25,52**	**5**	**0,000**	**0,30**
The application you use is organised:	**17,25**	**4**	**0,002**	**0,25**
The application you use is user-friendly:	**11,81**	**4**	**0,019**	**0,20**
Is the application intuitive and the functions easy to remember?	**12,16**	**4**	**0,016**	**0,21**
Does the application have any flaws?	3,97	2	0,138	0,12
Rate your satisfaction with the application.	**17,03**	**8**	**0,030**	**0,24**
How likely are you to recommend the application to a friend?	**27,80**	**9**	**0,001**	**0,31**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	**12,33**	**4**	**0,015**	**0,21**

Notes: χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

A series of Chi-squared analyses yielded a number of statistically significant results for the relationship between how high home budget management applications are rated and education. The only indication was that education is not linked with how the complexity of the software installation is evaluated $\chi2$ (3) = 2.71; p = 0.439; V = 0.10 and with the assessment of flaws in the application $\chi2$ (2) = 3.97; p = 0.138; V = 0.12.

Among those with higher education, a greater percentage of respondents only used a mobile application (42.93%), and these people also rated the application's transparency, organisation and user-friendliness higher.

People with higher education were more often of the conviction that the application was definitely intuitive (47.44%) and rated their level of satisfaction with the application higher (M = 8.54 points vs M = 8.06 points). People with higher education were also more likely to recommend the application to their friends (M = 8.49 points vs M = 7.74 points). Such people also tended to think that the application helped them manage their finances during self-isolation, quarantine and remote work. Level of education was most strongly associated with the desire to recommend the application to friends.

Table 8. Results of Chi-squared analyses for the relationship between the assessment of home budget management application and the place of residence

Place of residence	χ^2	df	p	V
How can you use the application?	8,11	8	0,423	0,12
How complicated was it to install?	15,24	12	0,229	0,13
The application you use is transparent:	31,18	20	0,053	0,17
The application you use is organised:	**26,91**	**16**	**0,043**	**0,15**
The application you use is user-friendly:	**30,78**	**16**	**0,014**	**0,16**
Is the application intuitive and the functions easy to remember?	14,31	16	0,576	0,11
Does the application have any flaws?	9,05	8	0,338	0,13
Rate your satisfaction with the application.	**64,87**	**32**	**0,001**	**0,24**
How likely are you to recommend the application to a friend?	41,98	36	0,228	0,19
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	25,79	16	0,057	0,15

Notes: χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Another series of Chi-squared analyses showed that the place of residence was statistically significantly linked with the evaluation of the application's organisation $\chi2$ (16) = 26.91; p <0.05; $V = 0.15$, user-friendliness $\chi2$ (16) = 30.78; p <0.05; $V = 0.16$, and satisfaction with the application $\chi2$ (32) = 64.87; p <0.01; $V = 0.24$.

The inhabitants of cities with 150,000–500,000 residents rated organisation and user-friendliness the highest while village residents gave these aspects the lowest rating. Also, the inhabitants of cities with 150,000–500,000 residents were the most satisfied with the application. Place of residence was most strongly associated with satisfaction.

Table 9. Results of Chi-squared analyses for the relationship between the assessment of home budget management applications and household size

Household size	χ^2	df	p	V
How can you use the application?	8,97	8	0,345	0,13
How complicated was it to install?	20,68	12	0,055	0,16
The application you use is transparent:	13,36	20	0,862	0,11
The application you use is organised:	21,19	16	0,171	0,14
The application you use is user-friendly:	20,56	16	0,196	0,13
Is the application intuitive and the functions easy to remember?	12,33	16	0,721	0,11
Does the application have any flaws?	7,76	8	0,457	0,12
Rate your satisfaction with the application.	25,55	32	0,783	0,15
How likely are you to recommend the application to a friend?	51,63	36	0,054	0,21
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	17,46	16	0,356	0,12

Notes: *χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship*

There was no indication that the size of the respondents' household was statistically significantly associated with how they rated home budget management applications.

Similarly, Table 10 below presents the results of Chi-squared analyses for the relationship between the assessment of the home budget management application and income.

Table 10. Results of Chi-squared analyses for the relationship between the assessment of home budget management applications and income

Income	χ^2	df	p	V
How can you use the application?	12,71	10	0,241	0,15
How complicated was it to install?	24,08	15	0,064	0,17
The application you use is transparent:	**40,34**	**25**	**0,027**	**0,17**
The application you use is organised:	**56,68**	**20**	**0,000**	**0,23**
The application you use is user-friendly:	27,89	20	0,112	0,16
Is the application intuitive and the functions easy to remember?	20,28	20	0,440	0,14
Does the application have any flaws?	14,60	10	0,147	0,16
Rate your satisfaction with the application.	**74,32**	**40**	**0,001**	**0,23**
How likely are you to recommend the application to a friend?	**66,97**	**45**	**0,018**	**0,22**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	25,79	20	0,173	0,15

Notes: *χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship*

Chi-squared test results demonstrated that the level of per capita household income was statistically significantly linked with the transparency rating $\chi2$ (25) = 40.34; p <0.05; V = 0.17, application organisation $\chi2$ (20) = 56.68; p <0.001; V = 0.23, satisfaction with the application $\chi2$ (40) = 74.32; p <0.01; V = 0.23 and the willingness to recommend the application $\chi2$ (45) = 66.97; p <0.05; V = 0.22.

The greater the respondents' per capita household income, the more favourable was their assessment of the application's transparency and organisation, the higher their satisfaction with the application and the greater the likelihood of recommending it to friends.

The next stage of the study was to determine whether the assessment of the home budget management application was related to different ways of using the application and the type of application used (banking/non-banking). For this purpose, a series of Chi-squared analyses was also performed. The following table 11 presents the results of the Chi-squared tests for the relationship between the assessment of home budget management applications and the way the application is used.

Table 11. Results of Chi-squared analyses for the relationship between the assessment of home budget management applications and the way the application is used

How can you use the application?	χ^2	df	p	V
How complicated was it to install?	**22,19**	**6**	**0,001**	**0,20**
The application you use is transparent:	**39,29**	**10**	**0,000**	**0,27**
The application you use is organised:	12,96	8	0,113	0,15
The application you use is user-friendly:	**19,41**	**8**	**0,013**	**0,18**
Is the application intuitive and the functions easy to remember?	**30,74**	**8**	**0,000**	**0,24**
Does the application have any flaws?	5,79	4	0,215	0,10
Rate your satisfaction with the application.	**39,99**	**16**	**0,001**	**0,27**
How likely are you to recommend the application to a friend?	**37,58**	**18**	**0,004**	**0,26**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	**15,87**	**8**	**0,044**	**0,17**

Notes: χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

A series of Chi-squared analyses gave a number of statistically significant results for the relationship between the assessment of home budget management applications and the way the application is used. How the application is used was only demonstrated to be unrelated to the evaluation of the application's organisation $\chi2$ (8) = 12.96; p = 0.113; V = 0.15 and with the evaluation of application flaws $\chi2$ (4) = 5.79; p = 0.215; V = 0.10.

People who only used the application via a website considered the software to be the most difficult to install, and these people also believed that the application was the least transparent and user-friendly. Furthermore, those who only used the application via a website were of the opinion that it was less intuitive and were the least satisfied with it. People using the application solely via a website were the least likely to recommend the application to their friends, and believed that the application helped them manage their budget during the pandemic the least.

Also, Chi-squared tests were used to analyse the relationship between the assessment of home budget management applications and the type of applications.

Table 12. Results of Chi-squared analyses for the relationship between the assessment of home budget management applications and the type of application

Type of application	χ^2	df	p	V
How can you use the application?	4,62	2	0,099	0,13
How complicated was it to install?	**9,45**	**3**	**0,024**	**0,18**
The application you use is transparent:	9,16	5	0,103	0,18
The application you use is organised:	**14,63**	**4**	**0,006**	**0,23**
The application you use is user-friendly:	6,87	4	0,143	0,16
Is the application intuitive and the functions easy to remember?	3,02	4	0,554	0,10
Does the application have any flaws?	**6,77**	**2**	**0,034**	**0,15**
Rate your satisfaction with the application.	**17,01**	**8**	**0,030**	**0,14**
How likely are you to recommend the application to a friend?	**19,77**	**9**	**0,019**	**0,26**
Did the application you use help you manage your finances during self-isolation, quarantine or remote work?	8,39	4	0,078	0,17

Notes: *χ2- Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship*

A further analysis conducted by using Chi-squared tests showed that the type of application used was statistically significantly related to the evaluation how easy the application is to install $\chi2$ (3) = 9.45; p <0.05; V = 0.18, with the assessment of its organisation $\chi2$ (4) = 14.63; p <0.01; V = 0.23, flaws $\chi2$ (2) = 6.77; p <0.05; V = 0.15, satisfaction with the application $\chi2$ (8) = 17.01; p <0.05; V = 0.14 and the willingness to recommend it $\chi2$ (9) = 19.77; p <0.05; V = 0.26. People using a non-banking application more often considered that the software was easy to install and rated the organisation of the application higher. People using the banking application noticed flaws in the application more often, and satisfaction with using the application was rated higher by users of a non-banking application (M = 8.45 vs M = 8.25). People using a non-banking application were more likely to recommend a budget management application (M = 8.38 vs M = 7.75).

5. Discussion

The study attempts to verify how popular and useful are applications supporting personal finance management in Poland. Low popularity of applications supporting the process of personal finance management reported in numerous market studies was a reason to conduct the first nationwide survey in Poland. The study showed that users more often use non-bank applications than financial managers offered by banks. High diversification of the market in terms of PFM applications gives a chance to potential users to choose a tool tailored to their needs. Therefore, one should wonder why the offer of banking institutions is not attractive to current users? Lack of the previous extension of services in banking applications does not give a chance for full use of bank managers, among other things, through the lack of change in categorization of expenses and gaps in technology (import and export of data) and communication with the bank. However, the authors of the study point out that the pandemic period may influence the acceleration of technological measures and the following legal regulations in mobile banking. It should be noted that it is necessary to continue research work on the topic of individual functionalities of PFM applications, which may be a motivating factor for financial institutions to better adapt tools to the needs of customers. It is also worth considering consortium research on the subject.

6. Conclusion

The study showed that men and those in the 26–35 age group most often used home budget management applications during the pandemic and self-isolation. Women noticed flaws in budget management applications more often and were less likely to recommend an application to their friends. Men were more often of the opinion that the application they used helped them manage their finances during self-isolation, quarantine and remote work. There was no single relationship in the study group between evaluation of applications and age. Most of the

people who use applications have higher education. These people also rated applications much higher, considered them clear and easy to use, and would be more likely to recommend them to their friends. It was also demonstrated that the respondents' place of residence and income were related to how applications were evaluated. Applications were rated best by city residents and those with high per capita household incomes.

Most of the respondents used applications in their mobile and website versions, or just the mobile version. However, the minority of people who only used an application in its website version rated it the worst and would be more reluctant to recommend it to their friends. These relationships were moderately strong. People using non-banking applications also rated the application much better. Despite the differences described, most of the respondents conceded that the application helped them monitor their household budget during self-isolation and remote work. The respondents mentioned that applications had many advantages and only a handful of disadvantages.

The SARS-CoV-2 pandemic has cast light on gaps in remote customer service, such as the need for better adaptation to the requirements of making current settlements and payments, the inability to scan documents, and the lack of advice and ongoing contact with a consultant. The study conducted in the context of social isolation identified opportunities and threats for providers of financial management support services, especially in terms of the tools on offer. The assessment of PFM application usability gives room for them to be adapted to the changing needs of consumers. The issues raised require further, cognitive research. The conducted research confirmed research hypotheses H1-H6.

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Krzysztof WALISZEWSKI is Associate Professor in Poznań University of Economics and Business, Poland, at the Institute of Finance. His research focuses on the personal financial planning and management, financial intermediation, personal financial advice, fin-tech and robo-advice.
ORCID ID: 0000-0003-4239-5875

Anna WARCHLEWSKA is Assistant Professor in Poznań University of Economics and Business, Poland, at the Institute of Finance. Her research focuses on personal financial management, modern applications of mobile banking - PFM, financial education, financial exclusion.
ORCID ID: 000-0003-0142-7877

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ROBOTIC PROCESS AUTOMATION IMPLEMENTATION, DEPLOYMENT APPROACHES AND SUCCESS FACTORS – AN EMPIRICAL STUDY[*]

Andrzej Sobczak

Warsaw School of Economics, Collegium of Economic Analysis, Niepodległości 162, 02-554 Warsaw, Poland

E-mail: sobczak@sgh.waw.pl

Abstract. An ever broader use of digital technologies which will lead to profound changes in the functioning of both individual entities as well as entire industries. These changes are referred to as digital transformation. Automation of business processes is a significant aspect of digital transformation. More and more entities (especially in such sectors as: banking, insurance, BPO/SSC, telecommunications) are implementing IT tools that are classified as part of the currently emerging RPA (Robotic Process Automation) category, where the term robot has a metaphorical meaning here – it is a particular type of software, and not a device. It should be emphasized that large scale robotic process automation cannot be viewed as an IT project. It is a business change project with a technical component, very frequently carried out outside the IT department by the company's business units. In the long term - along with the popularization of cognitive robotic process automation - it will lead to the growth of digital innovations at enterprises. The article attempts to answer four research questions: RQ1) what are the premises for the implementation of robotic process automation by enterprises, RQ2) how the implementation of robotic process automation is carried out from the organizational point of view, RQ3) in which areas of enterprise business operations is robotic process automation applied and RQ4) what factors determine the success of robotic process automation. The literature research method is used in the article and the results of surveys carried out among 238 Polish enterprises are presented. The results obtained allow us to conclude that the enterprises surveyed are only at the beginning of the mass scale robotic process automation, but due to the increasingly competitive environment, there will be no turning back.

Keywords: Robotic Process Automation; Business Process Management; Digital transformation; Digital innovations; Entrepreneurship

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1. Introduction

As noted by M. Jarrahi, S. Zuboff's study "In The Age Of The Smart Machine: The Future Of Work And Power" was published already at the end of the 1980s, in which the author, applying an ethnographic approach, described in detail the impact of digital technology on the employees and their work. In spite of the rapid changes in technology over the recent decades, Zuboff's main observations with respect to computerization, and automation in particular, and its impact on work, are still largely relevant. In her opinion, automation means the use of technology to perform work faster and more efficiently, which will lead to profound changes in the labor market. Zuboff proposed that computer systems should be perceived as "smart machines", and her conceptualization was one of the first attempts to examine the transformational nature of IT with respect to work automation (Jarrahi, 2019). Six years later, in 1995, J. Rifkin presented a hypothesis that "we are entering a new phase in world history where fewer and fewer workers are needed to produce goods and services for all mankind" (Rifkin, 1994). The shrinking demand for manpower is due to the advances in process automation made possible by the use of the increasingly sophisticated information and telecommunications technologies. However, some researchers indicate that there is a tendency in the media to exaggerate the scope of replacing human labor with robots. This is demonstrated, among others, by the results of research (Eikebrokk, Olsen, 2020), as part of which the impact of robotic process automation on changes in the white-collar workers' employment level was analyzed. According to the above mentioned authors, robotic automation at the current stage of its implementation does not lead to workforce layoffs - most often the personnel ends up being transferred to perform other tasks. However, one should be aware of the fact that business process automation technologies, as a result of combining them with artificial intelligence, have more and more "power". This may result in profound changes in the employment structure in the future. In particular, automation will push employees out of certain jobs, and. at the same time, there will be a growing demand for workers with new competencies (Varghese, Kumar, 2017).

Robotic Process Automation is an area that is growing particularly fast at the moment, – both in terms of its application, as well as research. The concept is viewed in two different ways in the subject matter literature – narrow and broad.

According to the narrow view, the term refers to a class of information technology tools used to automate business processes using software robots, where software robots are computer programs operating based on the predefined algorithms, used to automatically perform business processes or parts thereof. They usually imitate human labor, most often reproducing it faithfully. Robots are operating based on the preset algorithm, but more and more often they are enriched with certain elements of artificial intelligence, and, as a result, they are able to make more complex decisions and learn based on the data provided – both structured, as well as unstructured (Lacity, Willcocks, 2018). From the terminology point of view, a software robot is also referred to as a digital worker in the subject matter literature.

In the broader view of the concept, "robotic process automation" can be regarded as a particular type of an organizational and technological change the inherent part of which is the deployment of specific software (including cognitive software), ultimately leading to the formation of a hybrid workforce (Fersht et al., 2019), (Lacity, Willcocks, 2018), (Willcocks et al., 2020). Such an workforce is understood as a coherent ecosystem of software robots as well as human resources with specific skills and competences, performing specific business processes and processing specific data. The latter, broader understanding of the robotic process automation concept has been assumed for the purpose of this article. The adoption of such an understanding of robotic process automation leads to the viewing of actions related thereto not only from the technology point of view but also from the organizational and cultural perspective.

Therefore, the topics discussed in the article fall within the thematic scope of the theoretical considerations and empirical research conducted as part of several sub-disciplines of the management science (Belez et al., 2019), in particular:

- Change management (sub-discipline: Strategic Management) - robotic process automation is considered in the article as a specific type of an organizational change that should be managed appropriately;
- Management in the robotic process automation environment (sub-discipline: Production, Services and Technology Management) – the management context in the robotic process automation environment is the main theme of the discussion presented in the article.

The objective of the article is to present – based on the literature studies – key robotic proces automation concepts and to verify such concepts based on the results of surveys conducted among Polish enterprises. In particular, the author will be looking for answers to the following research questions:

RQ1) what are the premises for the implementation of robotic proces automation by enterprises,
RQ2) how is the implementation of robotic process automation carried out from the organizational point of view,
RQ3) in which areas of enterprise business operations is robotic process automation applied,
RQ4) what factors determine the success of robotic process automation.

The rest of the article is structured as follows. Section two presents selected theoretical aspects of robotic process automation. Section three discusses the methodological and organizational aspects of the survey research conducted. Section four presents the results obtained and the discussion thereof. The study concludes with a summary and an outline of directions for future research.

2. Theoretical background of Robotic Process Automation - selected aspects

As presented in the first section, according to the narrow view, the term Robotic Process Automation refers to a class of information technology tools used to develop software robots that automate business processes or sub-processes, implemented using various IT systems (most often not integrated with one another). Robots developed using the RPA solutions are usually running on dedicated machines (physical or virtual) or in a cloud – private or public, performing most of the activities under the supervision of a human operator (while a robot can be started automatically, without human intervention). The human operator is also involved in handling exceptions and emergencies that may occur during tasks performed by robots built using the RPA tools.

RDA (Robotic Desktop Automation) and C-RPA (Cognitive Robotic Process Automation) tools - also known as I-RPA (Intelligence Robotic Process Automation) tools are very closely related to the RPA tools.

RDA is a category of software used to build robots that automate activities usually performed on a single work station (workstation) and operate at the graphical user interface level (typically using one of the variants of the "data scraping" technique - extracting data directly from the user interface). During the activities performed by a robot (whose launch is initiated by a human operator), created with the use of the RDA solutions, the robot can, if required, transfer control to the person supervising the given work station - so that he/she could make a decision that requires experience or a difficult to structure expert knowledge.

C-RPA is a category of software used to develop software robots typically used for the comprehensive robotic automation of complex business processes or sub-processes. Robots created with the use of the C-RPA solutions employ artificial intelligence mechanisms - in particular, machine learning, computer vision, natural language processing models. They usually run in the public cloud or on dedicated machines (physical or virtual) and perform most of the activities on their own (without or only with a minimal human operator participation). Their

determinant is the ability to process unstructured data and acting not on the basis of the predetermined rules, but adapting to changes in the environment thanks to the learning mechanisms.

It has been assumed for the purpose of this article that all types of software robot development tools are collectively referred to as RPA, unless they are directly referenced to a specific tool category.

Researchers dealing with robotic process automation have identified a number of distinguishing features of software robots developed using the RPA tools (Aguirre, Rodriguez, 2017), (Anagnoste, 2018), (Lacity, Willcocks, 2017), (Willcocks, Lacity, 2016):

- they are used to automate selected sub-processes that make up the given process or even tasks logically extracted out of such a process, definitely less often to automate processes end-to-end;
- they are, first and foremost, used with respect to operational processes and business support processes, they are implemented less often in the direct customer service area (Chatbots, Voicebots or Taskbots are typically used in the latter case); attempts are currently underway to apply robotic process automation also in the manufacturing processes - software robots are combined, for example, with sensors (that are a part of the Internet of Things solutions) and image recognition using the OCR tools (see Kobayashi at el., 2019).
- they automate sub-processes or mass (large scale) operations (i.e. performed multiple times within the assumed time unit – e.g. within a month or a year), most often by faithfully reproducing actions carried out by an operator thus far;
- their use does not entail the need to optimize or reengineer processes that are being robotically automated (although it is recommended);
- they operate based on the preset algorithm implemented therein (reproducing routine activities), but cognitive robots already have capabilities to learn and draw conclusions based on incomplete information;
- they perform operations directly on the presentation layer, i.e. the GUI (Graphical User Interface), of the domain systems (such as, for example, ERP, CRM systems, e-commerce platforms, etc.) – the same way a human operator does it (although some RPA tools allow for performing operations directly on the robotically automated applications' database layer);
- they do not require creating of dedicated APIs (Application Programming Interface) to exchange data between applications (although some RPA tools provide such options);
- they do not require programming in the classic sense (although some vendors provide such an option) - instead of writing a robot's code (strong coding), the robot is created in a dedicated tool using predefined graphic components (providing specific functionalities), which are then configured by providing specific parameters or recording actions (e.g. clicks) performed by a human operator; various tools provide diverse functionalities in this respect - e.g. recording of activities performed in a web browser (web recording), recording of activities performed on the user's workstation (desktop recording), recording of terminal sessions (terminal session recording);
- they use business logic that constitutes an integral part of the applications that a software robot will be working with, which eliminates the problem of reproducing such logic within the robot itself;
- they do not require a change in the code of the applications that the robot is interworking with, and therefore no knowledge of the internal structure of the individual applications is required, which is very important in case of the legacy systems;
- all operations performed by the robot can be recorded in the form of the so-called event logs, which can then be analyzed (for example, using the Process Mining tools).

It is also important to outline how the RPA tools are positioned in relation to other classic business process automation methods - such as workflow systems or BPMS (Business Process Management System) tools (Shaw at el., 2007). It can be assumed that both RPA, as well as the above mentioned classic solutions, have a common

set of goals: to increase efficiency and minimize the costs of performing business processes, while ensuring the highest quality of the products delivered by such processes. These goals are, however, achieved using completely different means. The implementation of workflow or BPMS solutions involves altering of the processes. Introducing changes thereto after the completion of their implementation often entails the need to carry out programming work, which requires time and appropriate IT competences. The RPA solutions are the opposite of this. Their suppliers strive to make them intuitive to use so that the representatives of business units could handle operating them on their own, so that they are able to create robots on their own without the support or with minimal support of the IT departments. This is usually done in dedicated teams that constitute a Center of Excellence. Additionally, the implementation of the RPA tools does not require changes in the IT systems already running in the company. This significantly reduces the time required for their implementation, which also translates into lower costs and a lower risk of failure. An in-depth analysis of approaches to process automation based on the classical method and with the use of the RPA tools is presented in (Stolpe at el., 2017).

Despite the fact that robotic process automation has been very well received by many enterprises, more and more often some specialists are beginning to make comments on this approach. The opinion of P. Fersht, who is considered to be the author of the term Robotic Process Automation, is particularly important. He notes that at many companies there has been a phenomenon of misunderstanding or even deliberate denial of the idea on which the original concept of robotic process automation was based. Enterprises have used this approach to automate the "old way of operating", rather than using it as a lever to actually reengineer business processes (Fersht at al., 2019). According to the survey conducted in 2019 by HfS Research among 590 leaders from the group of the world's largest 2000 companies, only 13% of organizations managed to scale the implementation of the robotic process automation tools. The authors emphasize that the majority of organizations implementing RPA "are still tweaking small projects, piecemeal tasks and broken processes. Most companies are not even close to introducing any kind of enterprise wide automation" (Fersht, et al., 2019). At the same time, robotic process automation is a natural direction of enterprise automation, but it must be viewed as a holistic undertaking where various tools (including those using artificial intelligence and advanced data analysis) and organizational change management mechanisms are combined.

Therefore, the author of this compilation proposes the following – broader than just technological - approach to robotic process automation: it is a construct covering the process, content and result of an organizational change, the core of which is robotic process automation carried out with the use of software robots. Where:
- process perspective refers to the activities, tools, organizational structures and human resources required to prepare organizations and processes for robotic automation, and to build, deploy, maintain and develop software robots; based on this approach robotic automation may be a continuous process;
- content perspective refers to the processes to be robotically automated and the software robots being developed;
- result perspective refers to the products of the robotic automation process – the created organizational structures responsible for robotic automation, implemented solutions used for robotic automation, robotically automated processes and the effects obtained as a result thereof.

Adopting such an understanding of robotic process automation requires considering activities related thereto not only from the technological perspective, but also - and perhaps even first and foremost - from the management, organizational and cultural perspective. As it is presented in (Lacity, Willcocks, Craig, 2017, p. 13), robotic automation is not an IT undertaking. It is a business venture with a small IT component - 98% of the undertaking is related to the business rules, which means that, first of all, business process experts are needed to carry out such a project. Therefore, in a broader sense, robotic process automation cannot be equated only with the implementation of a project involving the deployment of an RPA class tool and developing software robots using

such a tool. Instead, it is necessary to consider it in the context of the implementation of a portfolio of projects (that are the carriers of change), and then to continuously maintain and further develop the changes implemented.

Companies are making decisions to deploy RPA class solutions – incurring material capital expenditures – based on the number of benefits that can be achieved as a result of such deployments. The most important ones include: reducing the costs of performing business processes, improving capabilities to carry out such processes without increasing headcount, enhancing employee experience by freeing personnel from performing the most mundane, routine activities, improving quality of products/services provided – as a consequence of minimizing the number of errors made by humans in the business processes carried out, or finally, increasing the number of innovations introduced by organizations by providing the ability to quickly prototype new products/services that require integrating various systems without the need to engage IT departments (Anagnoste, 2018), (Asatiani, Penttinen, 2016), (Willcocks, Lacity, 2016).

An additional factor impacting the current rise in popularity of the RPA solutions is the social and economic situation associated with the COVID-19 coronavirus pandemic. For a number of companies, robotic process automation allows not only to reduce costs, but also enables to ensure continuity of the ongoing processes.

It is also worth noting that a deployment of the robotic process automation tools can be viewed as the foundation for creating digital innovations, since innovations of this type can be understood as a) digital technologies, b) the result generated from the use of such technologies, c) the way processes are implemented using such technologies, changing the nature, structure or method of delivering products/services (to external and internal customers – the author's note) or the way value is created for such customers (Berman, 2012),(Nambisan at al., 2017). As a consequence, this my lead to the transformation of entire industries. Starting with the presented determinants of digital innovation, an assertion can be made that: (1) robotic process automation tools are classified as digital technologies, (2) robotic process automation - in particular carried out with the use of the C-RPA tools - enables the creation of completely new products (that would be unprofitable or impossible to deliver based on the traditional enterprise operations methods), (3) robotic process automation changes the way services are delivered (in particular internal services – provided between the individual departments of a company), (4) robotic process automation may bring about the transformation of entire industries (this is applicable, for example, to the BPO/SSC industry (Suri at al., 2017), (Willcocks at al., 2017).

At the same time, there is a high probability of a number of risk factors materializing during robotic process automation. The most important of them include: a) risk of the wrong perception of robotic process automation – viewed only through the prism of activities aimed at cutting the costs related to human resources, b) risk related to the wrong choice of the robotic process automation model at the given organization, c) risk related to the wrong approach to change management in the robotically automated processes, d) risk related to the resistance of the personnel involved in the processes to be robotically automated, e) risk of a competence gap (Lacity, Willcocks, 2017).

It should also be noted that the future of work environment in many industries is not only its digitization, but also its hybrid nature, where the hybrid nature is understood here as creating of the conditions enabling close cooperation between robots and humans. Such cooperation will be the source of a number of challenges and risks - managerial, ethical, cultural (Malshika et al., 2019).

3. Research objective and methodology

In order to answer the research questions presented in the introduction to the article, the author prepared and conducted a survey research in the April - June 2020 time frame. It was composed of two stages – the pilot stage and the main survey. As part of the pilot stage, a questionnaire on robotic process automation was created and

verified. The survey questionnaire was verified by way of a pilot survey conducted among 15 enterprises representing industries that were planned to be included in the main survey. The subject of the verification was the level of understanding by the respondents of the questions included in the questionnaire, as well as the completeness thereof. As a result of the completed pilot stage, modifications were introduced in the questionnaire itself - four questions were significantly altered, and the wording of another three questions was made more precise. Due to the changes in the questionnaire, the research material collected during the pilot stage was not used in the further research procedure. As part of the main stage of the research, the key survey - from the point of view of the entire research procedure - was conducted. The selection of enterprises for the survey was deliberate - an enterprise had to declare the deployment of at least one software robot in the production environment (developed with the use of the RPA, RDA or C-RPA class tool).

The CAWI (Computer Assisted Web-Interviews) technique was used to carry out the survey, where the respondent individually completed the electronic version of the questionnaire available on-line. It is currently one of the most frequently used polling techniques. As Smith and Kim point out, CAWI is a part of the Computer Assisted Survey Information Collection (CASIC) group of techniques, that are a part of the broader group of Computer Assisted Data Collection (CADAC) techniques (Smith, Kim, 2015). Several factors were behind the author's choice of this research technique. The use of the questionnaire in the electronic form was, first and foremost, aimed at obtaining possibly largest number of collected surveys (the survey was addressed to a specific group of the respondents for whom on-line tools are a natural work environment), shortening the time it took to conduct the survey, enabling the respondents to provide answers at a time convenient for them and cutting the cost of conducting the research work, while, at the same time, maintaining a high degree of completeness and quality of the answers (possible to obtain thanks to the introduction of validation rules for the individual fields of the questionnaire and validation across the individual fields; such validation was applied due to the problems that had occurred during the pilot survey carried out with the use of the paper version of the questionnaire). Significant arguments in favor of choosing the CAWI technique also included the ease and convenience of filling in of the questionnaires by the respondents, as well as the reduction of the interviewer's influence on the answers given by the respondents (such influence could occur in case of the face-to-face survey). The final argument for choosing this research technique was the coincidence of the timing of the survey with the pandemic situation, and the resulting limitations of direct communications with the respondents.

The answers obtained were subjected to additional verification, beyond just checking that all of the mandatory fields in the questionnaire had been filled. In case of ambiguity or inconsistency in the answers, the respondent was contacted by e-mail (the provision of the business e-mail address of the person completing the questionnaire had been a prerequisite for including the given questionnaire in the research pool) and asked to provide explanations by e-mail, or in the event that there were more ambiguities - a telephone conversation was arranged or the teleconference tools - Zoom and MS Teams – were used.

The author made a conscious decision not to engage a survey company in the research. It is true that such a method of conducting a survey would provide a number of benefits (among others, the ability to directly clarify any ambiguities that the respondents faced when filling in the questionnaire, increased motivation of the respondent to complete the questionnaire, which translates into a higher rate of survey returns), but it also has a number of limitations. First of all, it significantly extends the time and increases the costs of conducting a survey, and also generates the risk of diversified training of the individual interviewers, which leads to the possibility of inconsistencies occurring in the explanations provided to the respondents. Face-to-face surveys with the use of interviewers are advisable when dealing with questionnaires containing a large number of open-ended questions (which was not true in case of the questionnaire used by the author, as practically all of the questions were closed-ended) and in case it is necessary to take actions aimed at forcing answers to all of the questions (this was not true in case of the questionnaire used by the author, as the system applied to develop the questionnaire enabled imposing of the obligation on the respondent to provide an answer).

Ultimately, a total of 238 questionnaires (out of 294 sent) were qualified for the analysis, with each of them meeting the following set of conditions:

- questionnaire was completed by a representative of a company from an industry that was included in the study (23 questionnaires were rejected due to non-compliance with this condition);
- all mandatory fields were completed (all questionnaires met this condition); this way the author wanted to avoid averaging the respondents' answers, which is a typical procedure when such situations occur;
- all validation rules were complied with (26 questionnaires were rejected due to non-compliance with this condition);
- all of the doubts regarding the completion of the questionnaire were explained by the author by e-mail or during the interview (7 questionnaires were rejected due to non-compliance with this condition).

The questionnaire used during the survey included 34 questions. The author decided to use diverse types of questions in the questionnaire (in the main part of the questionnaire and in the respondent's particulars (demographics) section):

- 18 single-choice cafeteria questions,
- 3 multiple-choice cafeteria questions, including 1 closed-ended and 2 semi-open-ended questions;
- 12 questions with a 7 point Likert scale,
- 1 open-ended question (in the respondent's particulars (demographics) section - it related to the respondent's business e-mail).

The questions in the main part of the questionnaire were related to the conditions for implementing robotic process automation at an enterprise, the status and scope of robotic process automation, the approach to developing and maintaining software robots, combining robotic process automation with other process automation tools, factors determining the success of robotic process automation, the impact of robotic process automation on the business model of the enterprise and the enterprise management system.

A certain number of questions were included in the questionnaire as control variables. On one hand, the goal of this step was to take into account those attributes or characteristics of the environment/industry that may constitute alternative explanations of the results obtained. Such variables are related to the intensity of competition, the dynamics of the technological environment, the dynamics of the market and regulatory environment, as well customer attitudes. The remaining control variables were related to such issues as:

- enterprise size measured by the number of employees,
- enterprise size measured by revenue,
- enterprise sector.

In addition, a filtering question was introduced - its purpose was to separate the enterprises that had at least one software robot deployed in the production environment from those companies that could not demonstrate such deployment (in such case their answers were not included in the research pool).

A seven point (not a five point) Likert scale was used in the questionnaire, which was supposed to increase the accuracy of the measurement. Such a structure of questions is more and more often recommended in management sciences. However, despite the legitimacy of using the Likert scale with an extended number of response categories in empirical research - i.e. a 7 point scale instead of a 5 point scale, after the preliminary data analysis had been conducted, the decision was taken to combine two variants of answers in the categories appearing at the opposite ends of the scale. In other words, two variants of answers had been aggregated into categories that were later named "Strongly disagree"/"Strongly agree". On both ends of the scale the aggregation covered two categories, expressed on the original 7 point scale as "1 = Strongly Disagree" and "2 = Disagree". These

categories corresponded to the answers related to the respondents' negative attitudes. On the other hand, on the opposite end of the scale, two categories corresponding to the respondents' positive attitudes were aggregated: "6 = Agree" and "7 = Strongly agree". Finally, after the data had been converted, the new categories of the respondents' answers were assigned the following names as the components of the 5 point scale: "1 = Strongly disagree", "2 = Rather disagree", "3 = Hard to say", "4 = Rather agree", "5 = Strongly Agree". The low percentages of answers in the two categories on the 7 point scale ("2 = Disagree" and "6 = Agree") were the main reasons for the above combining of the variables, as in the original survey there had been some kind of artifacts in the answers given by the respondents

The research covered companies from the following industries: banking and insurance, other finance (apart from banking and insurance), professional business services (based on the following split: Business Process Outsourcing (BPO) and Shared Services Centers (SSC)), e-commerce, trade, logistics, media, advertising and entertainment, health care (including pharma), manufacturing, telecommunications, utilites (including energy, gas, heat). The respondents included mainly representatives of shared services centers (SSC), banking and insurance, manufacturing/production and professional services centers for business (BPO) – see fig. 1. According to the literature research carried out by the author, companies operating in these industries are the world's leaders in robotic process automation.

IT (including the RPA tool suppliers) and consulting companies were deliberately not included in the study, as the thematic scope covered by the survey was primarily related to the intra-organizational issues of robotic process automation. The research also did not cover public administration units, as such entities have not yet begun to apply robotic process automation on a larger scale. The author monitored the implementations of robotic process automation at Polish organizations. At the time the study began, only two municipality offices (city halls) reported robotic process automation activities, and a few more were just getting ready for such projects; also there are few references to deployments at such units in the subject matter literature, - see for example (Nauwerck, Cajander, 2019).
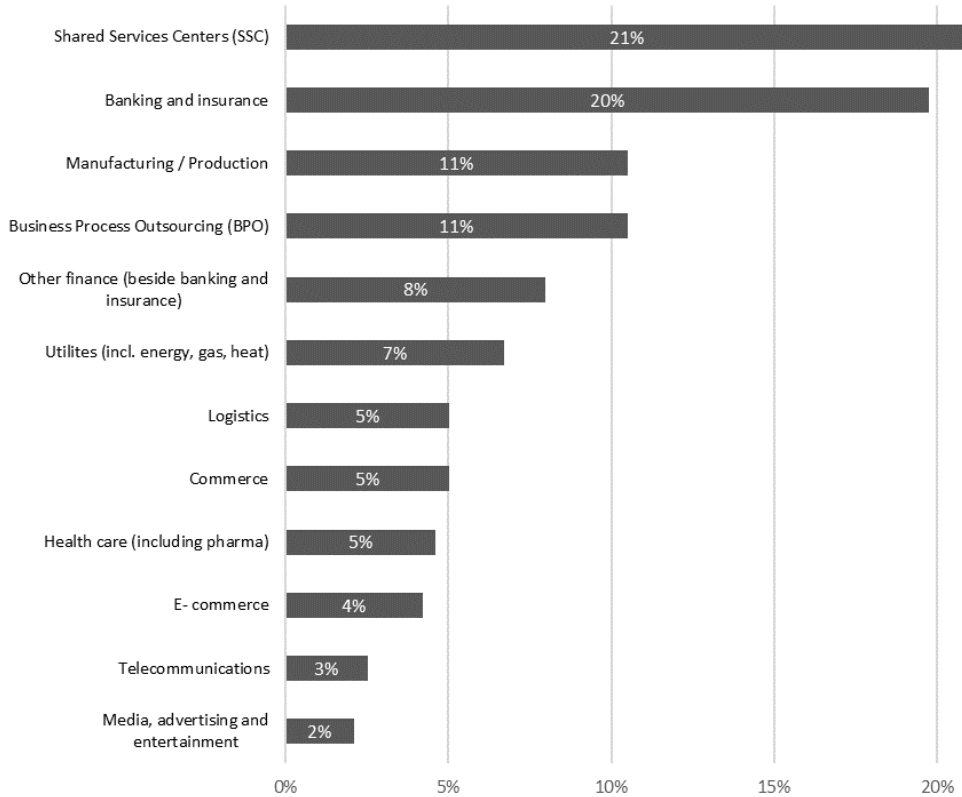
Fig. 1. Industries included in the research [N = 238]
Source: compiled on the basis of own research

As mentioned earlier, 238 enterprises from all over Poland took part in the survey. Based on the analysis of the respondents' composition (see fig. 2), it can be noted that large enterprises (i.e. with more than 250 employees) were a dominant group – they accounted for 75% of the entire sample. The small and medium-sized enterprises – i.e. those employing up to 250 people – were a minority – representing 25% of the total.
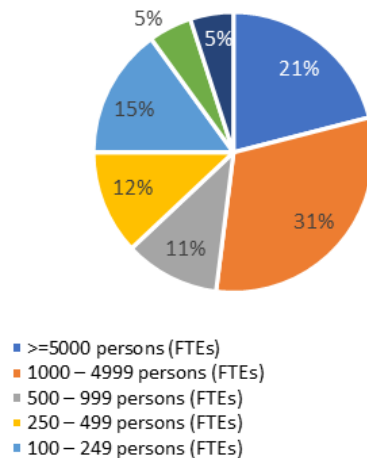
Fig. 2. Size of enterprises taking part in the survey [N = 238]
Source: compiled on the basis of own research

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When analyzing the results of the respondents' assessment of the environment in which their companies are operating (see fig. 3) it should be noted that it is extremely competitive (58% of the respondents indicated that the competition in their industry is very fierce), and customers are demanding (as many as 64% of the respondents indicated that customers in their industry expect very high quality of products/services provided). In addition, according to the respondents, the legal (including regulatory) and technological changes are taking place very rapidly (this is applicable to a lesser extent to the technological changes).
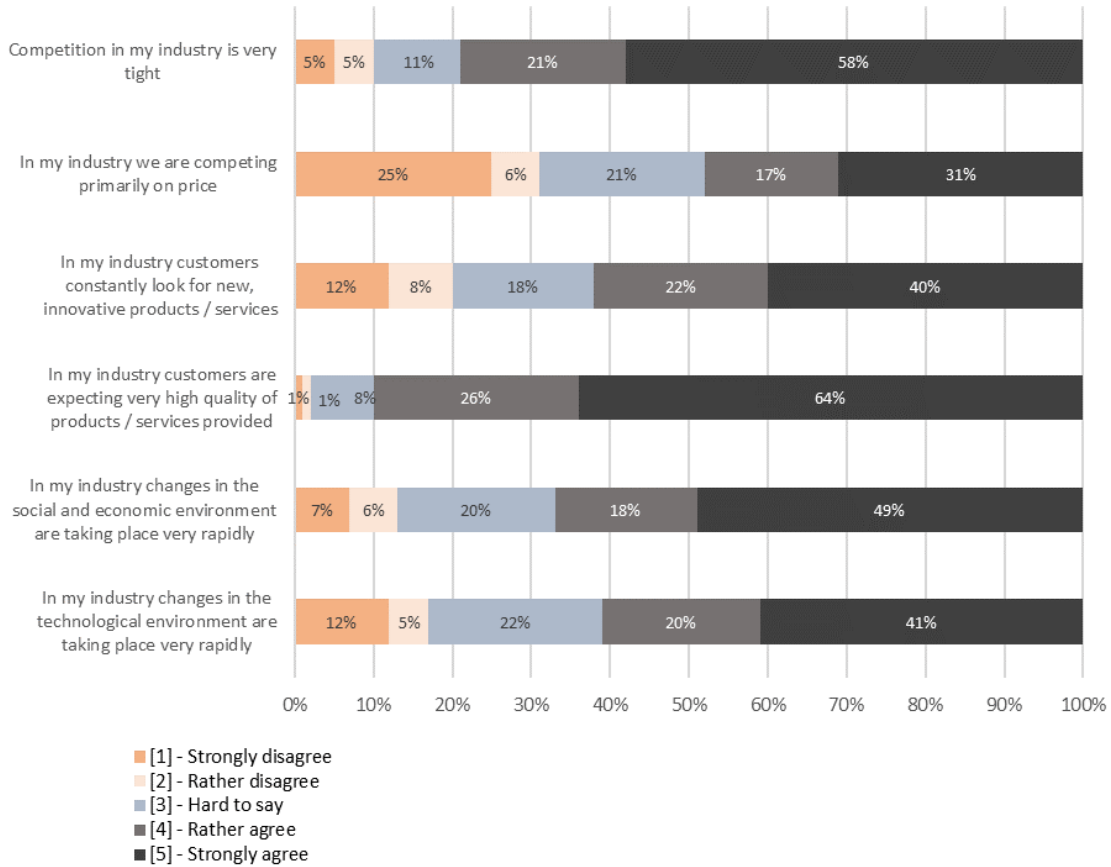
Fig. 3. Characteristics of the enterprise's environment [N = 238]
Source: compiled on the basis of own research

The respondents were mainly the managers of units/leaders of teams dealing with robotic process automation - 36%. Among the balance of the respondents, the managers/directors responsible for robotic process automation were a large group – accounting for 29% of the total (see fig. 4).
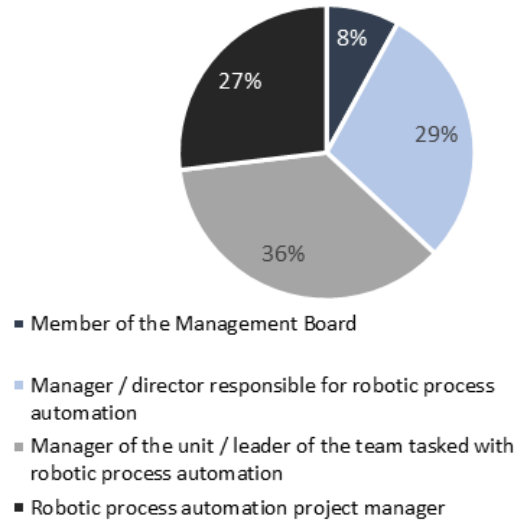
Fig. 4. Position of the respondents [N = 238]
Source: compiled on the basis of own research

People with limited experience in RPA related activities (between 1 and 2 years – representing 34% of the total), and even with very limited experience (less than 1 year – accounting for 30% of the sample) were a dominant group among the respondents (see fig. 5).
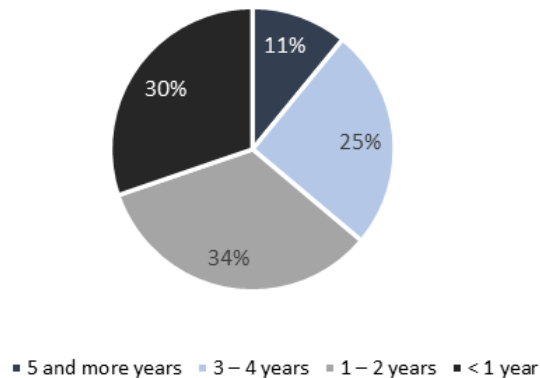
Fig. 5. Respondents' professional experience in robotic process automation [N = 238]
Source: compiled on the basis of own research

Such a composition of the respondents stems from the fact that for most of the people (as well as the enterprises surveyed) robotic process automation is a new subject. Previous analyses carried out by the author demonstrate that pilot implementations of robotic process automation projects in Poland began at the turn of 2017/2018, and only 2019 saw the establishment of this method of business process automation on the market.

4. Results and discussion

As indicated by the research conducted, robotic process automation is a new subject for the majority of enterprises (see: fig. 6). Nearly 1/3 of the respondents have been implementing robotic process automation for less than a year. The same number of the respondent organizations have been implementing robotic process automation for 1 to 2 years. Companies that have been implementing robotic process automation for more than 3 years (17%) are a minority among the enterprises surveyed. According to the author, these results indicate a very

preliminary phase of the robotic process automation implementation at the entities surveyed and their very low maturity in this respect.

■ Less than a year ■ Between 1 and 2 years ■ Between 2 and 3 years ■ More than 3 years
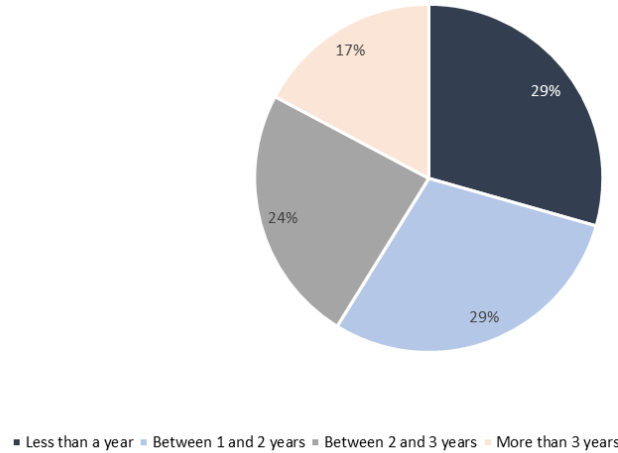
Fig. 6. Time enterprises have been implementing robotic process automation for [N = 238]
Source: compiled on the basis of own research

The time robotic process automation has been implemented for in the context of enterprise size (based on the number of employees) was also analyzed. Table 1 shows that large and very large enterprises were first to commence deploying robotic process automation solutions. On the other hand, small and medium-sized enterprises are just beginning to implement this approach.

Table 1. Analysis of the time robotic process automation has been implemented for versus the grouping variable "Enterprise headcount"

Test variables	Categories	Headcount							
		< 50 persons (FTEs)	50 – 99 persons (FTEs)	100 – 249 persons (FTEs)	250 – 499 persons (FTEs)	500 – 999 persons (FTEs)	1000 – 4999 persons (FTEs)	>=5000 persons (FTEs)	*Asymptotic materiality of the result*
		% of N in a column							
Time robotic process automation has been implemented for	Less than a year	67%	55%	36%	24%	35%	29%	12%	
	Between 1 year and 2 years	25%	9%	33%	31%	35%	26%	33%	
	Between 2 and 3 years	0%	18%	25%	38%	23%	26%	20%	0.001
	More than 3 years	8%	18%	6%	7%	8%	19%	35%	
	Total	100%	100%	100%	100%	100%	100%	100%	

Key: Grouping variable: *Enterprise headcount*. Adopted materiality level (0.05). The result below 0.05 shows the differences in the distributions of individual test variables due to the adopted grouping variable and variable distributions

Source: compiled on the basis of own research

As shown in fig. 7, the vast majority of the organizations surveyed have only 1 to 4 software robots deployed in the production environment (regardless of their individual types). Such a small number demonstrates that the organizations surveyed are at the initial stage of implementing robotic process automation.
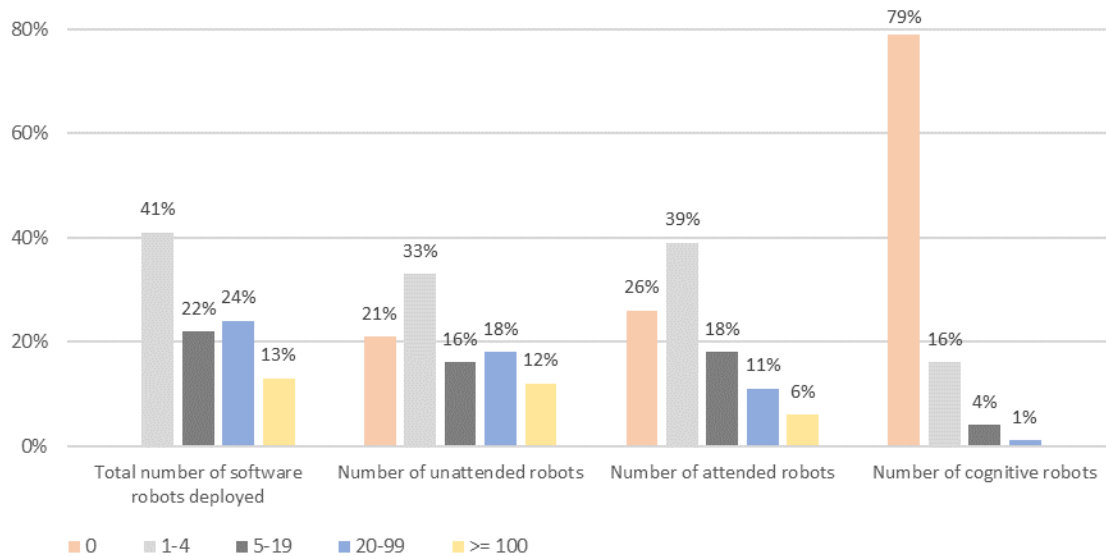
Fig. 7. Total number of software robots (attended, unattended, cognitive robots) deployed by enterprises [N = 238]
Source: compiled on the basis of own research

When analyzing the number of the individual types of robots' (attended, unattended, cognitive) deployments at the enterprises surveyed, it can be seen that a relatively small number of organizations (21%) have cognitive robots, of which the vast majority of enterprises have only 1 to 4 robots of this type. This demonstrates a very low level of intelligent robotic automation at these companies. The analysis of the classic robots' deployments - attended (usually built with the use of the RDA class tools) and unattended (usually built with the use of the RPA class tools) - indicates that only 12% (attended robots) and 6% (unattended robots) of the respondents stated that they had 100 or more robots deployed (as outlined in the literature, this is a commonly assumed threshold above which it is assumed that robotic process automation is carried out on a mass scale). At the same time, as many as 33% and 39% of the respondents, respectively, indicated that their enterprises use between 1 and 4 robots – attended and unattended (see fig. 7). In practice, this means that single processes or parts thereof are robotically automated at those companies.

Regarding factors behind the implementation of robotic process automation by a company (see: fig. 8), the option "Seeking to cut the company's operating costs" was chosen by nearly 78% of the respondents, who answered "Strongly agree", while 13% checked "Rather agree" (in total, the option to seek cost reductions was chosen by 91% of the respondents – the sum of these two response categories). On the other hand, only 4% strongly disagreed with this determinant of robotic process automation. The respondents also indicated seeking to relieve employees from performing routine activities as part of their work as a goal (in total, 88% of the respondents, the sum of the answers "strongly agree" and "rather agree"), which reveals the respondents' strong motivations to robotically automate processes in order to improve the employee experience. These results are in line with the literature research carried out by the author. It is also worth noting that one of the factors behind implementing robotic process automation is seeking to increase the company's innovations (it is indicated by 87% of the respondents in total, the sum of the answers "Strongly agree" and "Rather agree"). This aspect of robotic process automation has thus far been relatively little exposed among researchers. It has been assumed that robotic automation is, first and foremost, applied in the support processes that are not innovative in nature.

Legend:
- [1] - Strongly disagree
- [2] - Rather disagree
- [3] - Hard to say
- [4] - Rather disagree
- [5] - Strongly disagree
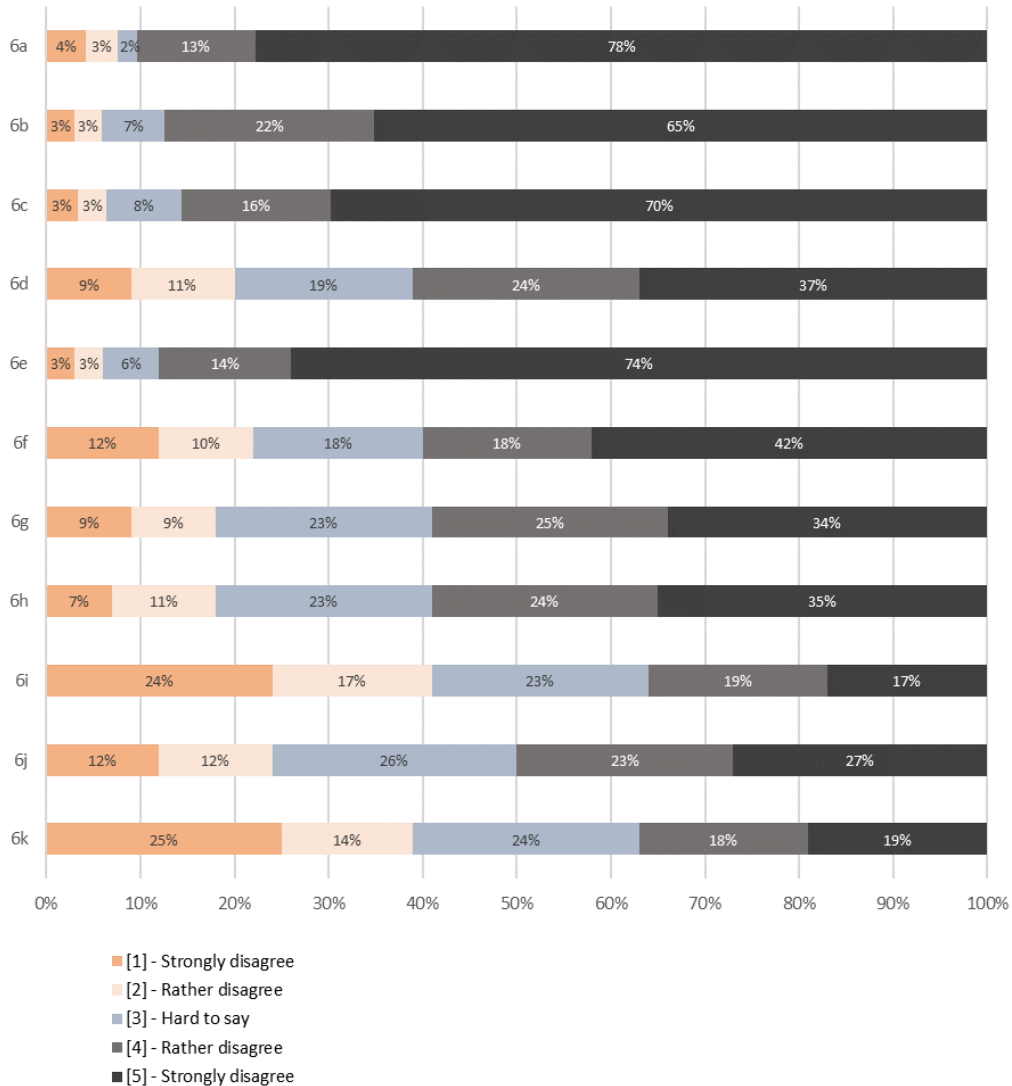
Key: Central measure (Median - ME) 50/50 of the distribution of answers for the individual items in the descending order: 6a = Seeking to cut the company's operating costs, 6b = Seeking to increase the company's innovations, 6c = Seeking to boost employee productivity, 6e = Seeking to relieve employees from performing routine activities (ME = 5.0 = Strongly agree). 6d = Seeking to reduce negative effects related to staff turnover, 6f = Seeking to liquidate workforce overtime, 6g = Seeking to react faster to changes in the company's environment, 6h = Seeking to improve customer experience, 6j = Seeking to minimize problems that occur as IT systems evolve (the so-called legacy systems syndrome) (ME = 4.0 = Rather disagree). 6i = Following the activities carried out by the competitors, 6k = Not very effective IT department of the company, not keeping up with business needs (ME = 3.0 = Hard to say).

Fig. 8. Factors that determine the implementation of robotic process automation by a company [N = 238]
Source: compiled on the basis of own research

Considering the surveyed enterprises' approaches to developing software robots (see: fig. 9), it can be noted that the most common formula is based on the Center of Excellence - 46% in total, while the least frequently used form is the involvement of the IT department in such projects (17%). These results are in line with the literature research which indicates that robotic process automation should be classified as "lightweight IT", implemented mainly by the business units (Stolpe et al., 2017).
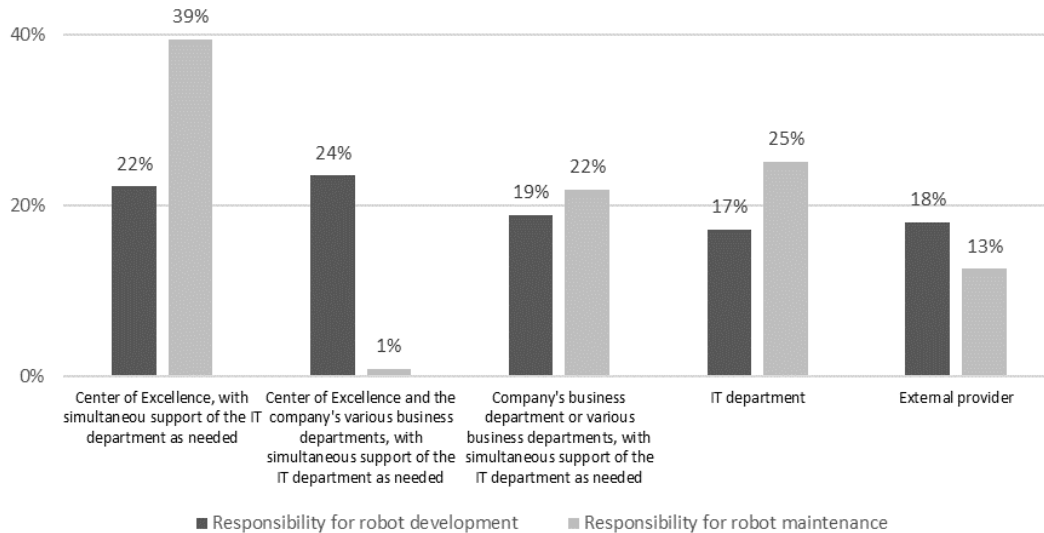
Fig. 9. Models of approaches to developing software robots [N = 238]
Source: compiled on the basis of own research

The vast majority of the enterprises surveyed implement robotic process automation in the form of a series of small steps (66% of the respondents indicated this method, versus 34% of the answers pointing to robotic process automation implemented as a large undertaking). The scope of robotic process automation is most often fragmentary in nature - usually covers 1-2 processes in a selected business area (see fig. 10), which may demonstrate that the companies surveyed are only just researching the capabilities of RPA or approaching it very cautiously. At the same time, it is worth noting that as many as 31% of the organizations surveyed view robotic process automation as a comprehensive undertaking - they have implemented or are planing to implement it in as many business areas as possible. From this point of view, robotic processs automation is becoming a fully fledged way to implement digital transformation.

When analyzing the results obtained, it is necessary to emphasize the need to develop and implement an effective governance model for robotic process automation at an enterprise. This is highlighted by D. Kedzior and E. Penttinen in their work. They are of the opinion that this is a prerequisite for the ability to effectively scale robotic process automation in the enterprise (Kedziora, Penttinen, 2020).

- 1-2 processes in a selected business area
- 1 business area
- As many business areas as possible
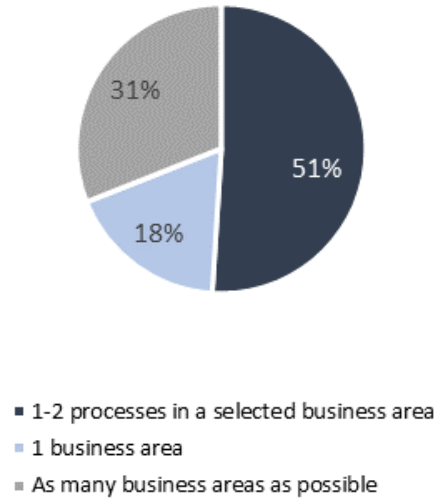
Fig. 10. Scope of robotic process automation at enterprises [N = 238]
Source: compiled on the basis of own research

The scope of robotic process automation at an enterprise in the context of its size (based on the number of employees) was also analyzed. Table 2 shows that enterprises employing 1000 and more people approach robotic process automation in a holistic manner, which may also stem from the fact that the potential for robotic process automation is greatest at such companies.

Table 2. Analysis of the scope of robotic process automation versus the grouping variable "Enterprise headcount"

Test variables	Categories	Headcount							Asymptotic materiality of the result
		< 50 persons (FTEs)	50 – 99 persons (FTEs)	100 – 249 persons (FTEs)	250 – 499 persons (FTEs)	500 – 999 persons (FTEs)	1000 – 4999 persons (FTEs)	>=5000 persons (FTEs)	
		% of N in a column							
Scope of robotic process automation at an enterprise	Fragmentary robotic process automation (1-2 processes in 1 business area)	58%	73%	61%	59%	65%	51%	25%	
	Robotic process automation of the selected business area	17%	0%	11%	17%	23%	18%	25%	0.003
	Holistic robotic process automation – of as large as possible number of business areas	25%	27%	28%	24%	12%	32%	49%	
	Total	100%	100%	100%	100%	100%	100%	100%	

Key: Grouping variable*: Enterprise headcount.* Adopted materiality level (0.05). The result below 0.05 shows the differences in the distributions of individual test variables due to the adopted grouping variable and variable distributions
Source: compiled on the basis of own research

As shown in fig. 11, the implementation of robotic process automation is usually preceded by small (as indicated by 62% of the respondents) and medium scale changes (48% of the respondents) in the processes. These results are in line with the literature research conducted. In a relatively small number of cases (11%) the changes in robotic processes are profound.

Process changes are generally:

Minor	62%
Medium	48%
No changes	16%
Alteration	11%

0%   10%   20%   30%   40%   50%   60%   70%
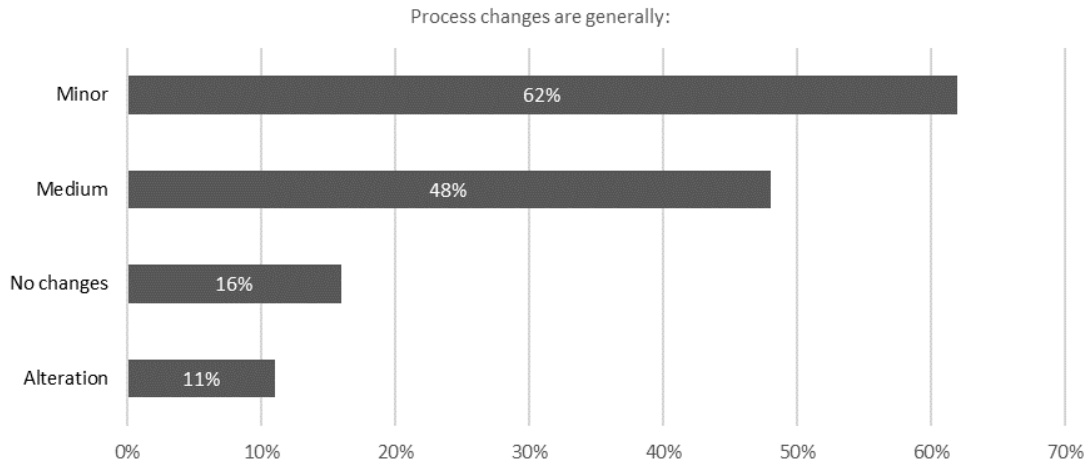
Key: The sum of the values does not equal 100% as the respondents have an option to check several answers to the same question
Fig. 11. Types of changes in business processes introduced prior to the robotic automation thereof [N = 238]
Source: compiled on the basis of own research

In the vast majority of the organizations surveyed robotic process automation is implemented based on the agile approach or its variants - as indicated by as many as 85% of the respondents in total (see fig. 12). The overwhelming minority use the classic approach – employed only by 15% of the organizations. Thanks to the use of the agile approach and the direct involvement of the business in robotic automation, the time needed to achieve business benefits is much shorter than in case of using the classic process automation methods.

15%   38%   23%   24%

- ■ "Hybrid approach" (agile + classic) with agile more prevalent
- ■ "Fully agile" approach, developed based on Scrum or similar methodology
- ■ "Hybrid approach" (agile + classic) with classic more prevalent
- ■ "Classic" approach, so-called Waterfall
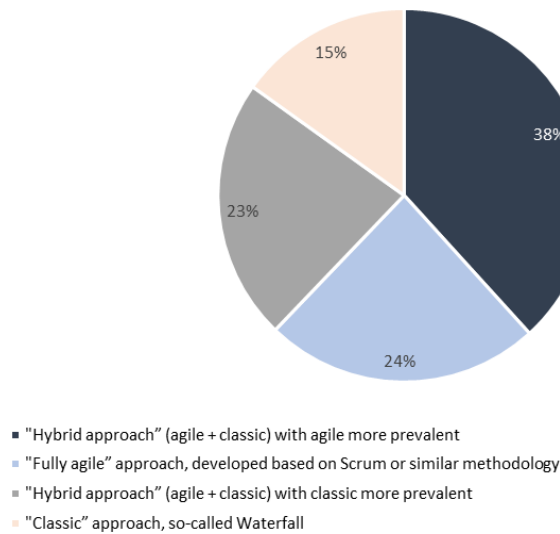
Fig. 12. Methodology applied to implement robotic process automation by the enterprises surveyed [N = 238]
Source: compiled on the basis of own research

As shown in fig. 13, robotic process automation is viewed as an extremely significant undertaking by the majority of the organizations surveyed. This is demonstrated by the fact that most often the works on robotic process automation at enterprises was initiated at the organizations surveyed by the company's management board (44% of the respondents gave such an answer), and only at 13% of the enterprises the initiative was a bottom-up approach – coming from the workforce.

■ Company's Management Board
■ Company's Vice President level (e.g. CFO, COO, CIO)
■ Director level (or similar)
■ Area manager / leader level (or similar)
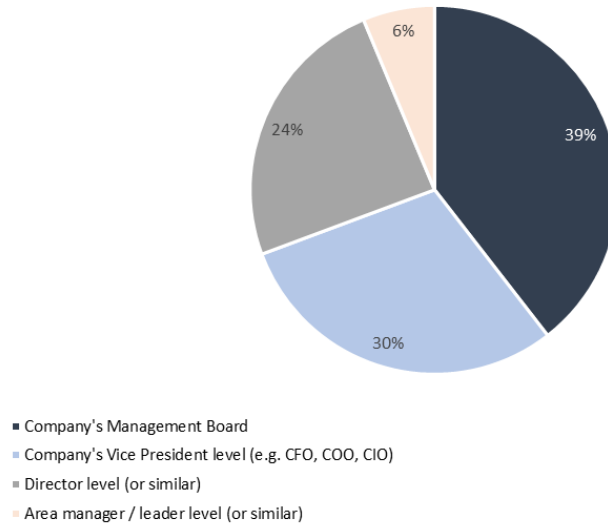
Fig. 13. Initiators of the works on robotic process automation at enterprises [N = 238]
Source: compiled on the basis of own research

Based on the analysis of the answers related to the area where robotic process automation is applied at enterprises, it is clear that the broadly understood finance sphere - accounting, reporting, settlements, controlling and reporting – is the dominant application area (see fig. 14). In addition, software robots are applied in HR, payroll and IT. These indications are in line with other literature research. It is worth pointing out, however, that robotic process automation is also beginning to be applied with respect to customer service - both at the stage of marketing and sales, as well as post-sales service or debt collection. The question regarding the robotic process automation application areas was partially open-ended in the questionnaire and the respondents were also able to indicate other areas of its use. Individual respondents indicated that, additionally, robotic process automation is used at their enterprises in such areas as logistics, master data management and production.
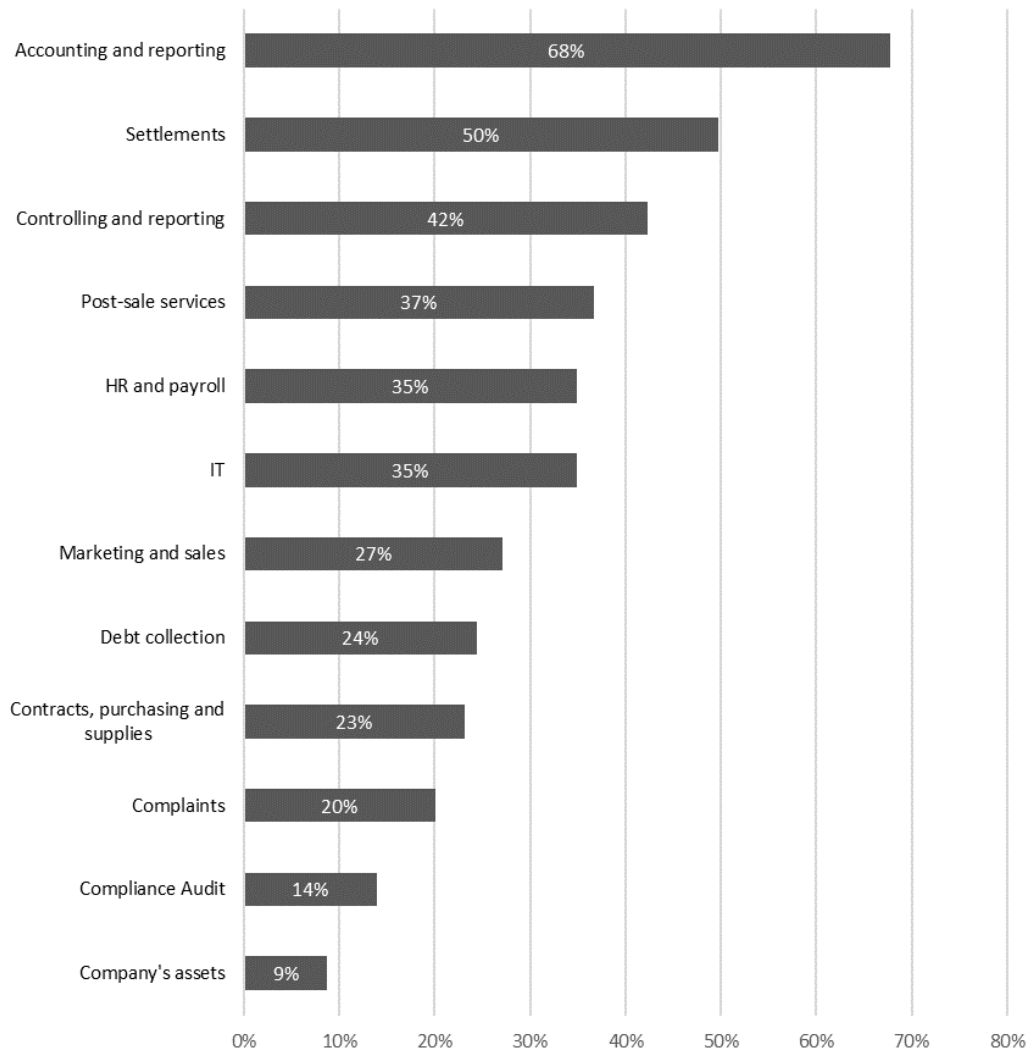
Fig. 14. Organizational units where software robots are used [N = 238]
Source: compiled on the basis of own research

As part of the research conducted, the author also made an attempt to answer the question: what factors have an impact on the success of robotic process automation (see fig. 15).
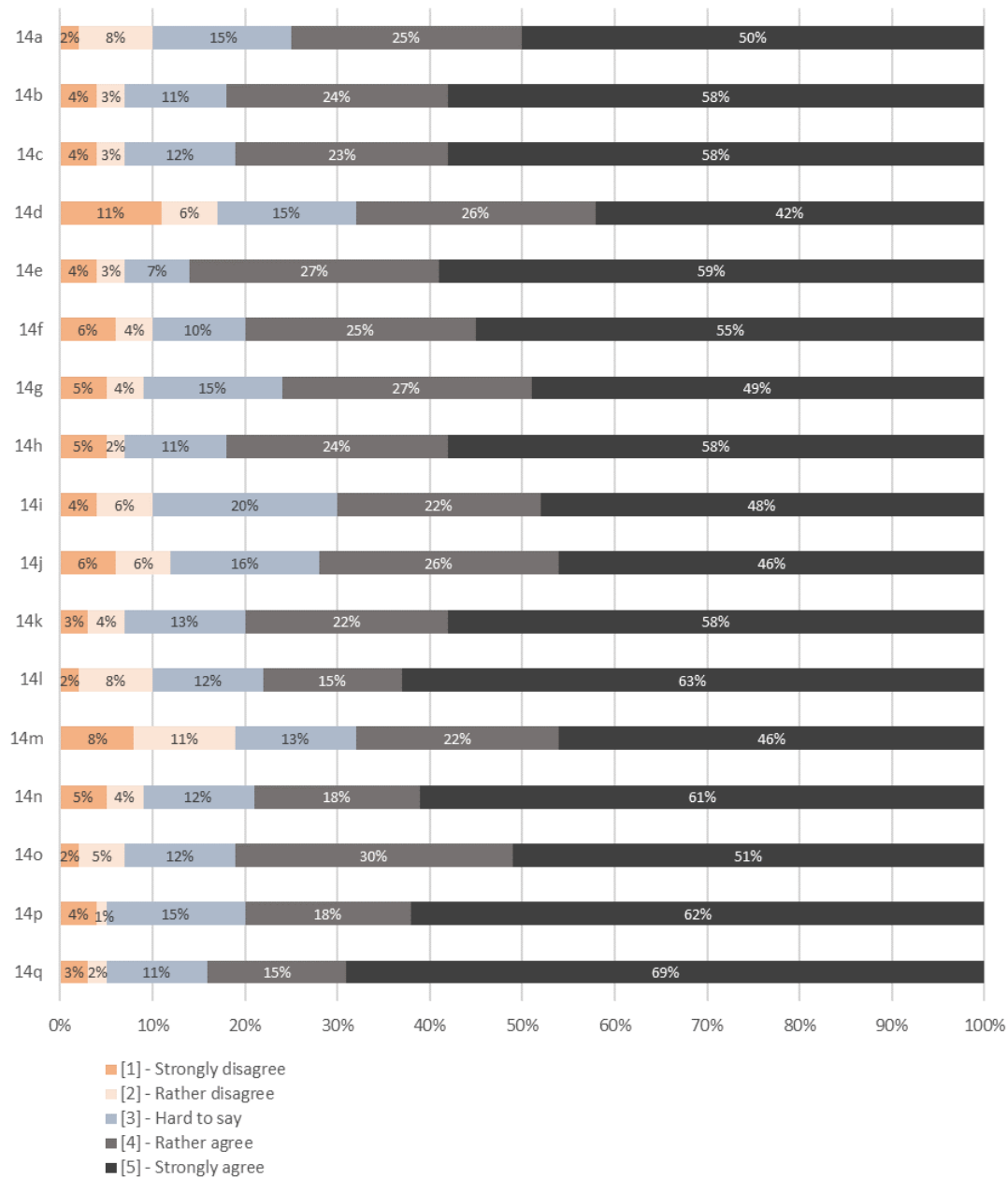
Key: Central measure (Median) 50/50 of the distribution of answers for the individual items in the descending order: 14b = Adopted organizational structure responsible for robotic process automation, 14e = Implemented principles of selecting and preparing processes to be robotically automated, 14f = Implemented principles of documenting and developing robots, 14h = Building robotic process automation competences among the business personnel, 14k = Promoting a pro-innovative organizational culture among the workforce, 14l = Linking the goals of robotic proces automation with the strategic objectives of the company, 14n = Direct involvement of the management team in innovative activities (including robotic process automation), 14o = Providing technological and management support from the consulting/IT companies, 14p = Well selected and interconnected set of robotic process automation tools (robotic process automation platform), 14q = Providing access to high quality data in a digital form that robots are working on, 14a = Developed robotic process automation strategy, 14c = Implemented principles of cooperation with IT/Security department (ME = 5.0 = Strongly agree). 14d = Implemented set of rules supporting the collection of structured knowledge of processes, 14g = Implemented rules on how to make changes to the already robotically automated processes / robots, 14i = Building competences on process management among the workforce, 14j = Agile organizational culture of an enterprise, 14m = Monitoring the progress of the implementation of robotic process automation by the management of the organization (ME = 4.0 = Rather agree).

Fig. 15. Factors impacting the success of robotic process automation at a company [N = 238]
Source: compiled on the basis of own research

In accordance with the respondents' answers, the main factors that determine the success of robotic process automation include the adopted organizational structure responsible for robotic process automation (in particular, the establishment of a dedicated Center of Excellence), the implemented principles of selecting and preparing processes to be robotically automated (according to the subject matter literature, it is one of the key factors determining the success of the works carried out), c) building robotic process automation competences among the business personnel and promoting a pro-innovative organizational culture among the workforce. This is particularly important in view of the fact that mass robotic process automation changes the demand for competences among the workforce - the role of reproductive skills is diminishing in favor of algorithmic and process thinking, as well as soft skills. It is worth noting that the results obtained underscore a very important role of the organizational, cultural and competence related aspects as success factors, and not the technological ones (such as the choice of a robotic process automation tool). In addition, high quality digital data also plays an important role in the success of robotic process automation. Enterprises must remember this and implement mechanisms in the organization that ensure such data is available.

4. Conclusions and further research

As indicated by the research discussed, robotic process automation is a new subject for many companies. Undoubtedly, however, it will be one of the most important aspects of the digital transformation in the coming years, while the coronovirus pandemic and the economic turbulences related thereto will only accelerate activities in this area. This is confirmed by, among others, data analytics companies' forecasts, according to which robotic process automation (RPA) tools are currently the fastest growing group of digital transformation technologies on the IT market. According to Gartner the sales of solutions and services in this area rose 63.1% in 2019, as compared to 2018, coming in at USD 1.3 billion (Gartner, 2019). According to Forrester's analysts the value of RPA licenses and services sold is to reach USD 2.9 billion by 2021 (Clair and others, 2017). While according to Fortune Business Insight analytics company, the value of the RPA market is to reach USD 6.8 billion by the end of 2026 (Fortune Business Insight, 2020).

It is worth noting that the subject matter literature indicates that the RPA tools will now undergo intensive development, which may lead to the arrival of a new generation of such solutions (Anagnoste, 2018). It is believed that the future for this class of tools is Cognitive Automation, i.e. such automation where the software has gained the ability to operate effectively in unforeseen and uncertain situations. Cognitive automation uses algorithms and technological approaches derived from the field of artificial intelligence, such as natural language processing, text analysis and data mining, semantic technologies and machine learning (Marshall, Lambert, 2018, p. 200-210). This allows IT tools to autonomously evaluate and interpret knowledge. Additional elements, but important from the perspective of using cognitive automation, will include having sufficiently large data sets (required for machine learning processes) and access to high computing power. Therefore, cognitive automation will usually be applied in combination with big data tools and cloud computing. In addition, some of the data processed as part of advanced automation will come (at least for some time yet) from paper documents or photographs. For this reason, it is important to use software for automatic, optical character recognition (OCR), enriched with natural language processing capabilities (Wróblewska et al, 2018).

Cognitive automation will allow for providing totally new options for action (van der Aalst et al., 2018, p. 271). Firstly, software implementing this type of automation will have the ability to learn to react to the appearance of new objects and the development of new situations (Leopold, van der Aa, Reijers, 2018). Such cases have, thus far, been the weakness of classical automation. In the event of an unforeseen situation, the tools, at best, provided information about it, at worst - they took nondeterministic actions. Secondly: software that provides cognitive automation capabilities will be able to make complex decisions or such decisions that deal with ambiguities or seemingly competing alternatives. And thirdly and finally, this class of software will be able to detect and react to the situations where the risk and consequences of an error are high.

In reference to the title of M. Ford's book, an assertion can be made that we are facing "The Rise of the Robots" (Ford, 2016).

Four research questions were defined in the introduction to the article. We managed to answer those questions in the course of the research process conducted. Referring to question RQ1 on the premises for implementing robotic process automation: enterprises, when planning activities in this area, mainly aim to reduce the costs of operations, relieve employees from routine activities, but also want to increase their innovations - be it in the product or process dimension. When analyzing the models applied to implement robotic process automation (question RQ2), an assertion can be made that the approach based on technology democratization is the dominating solution: most of the works in this area are carried out outside the IT department, usually by specialized centers of excellence (but there are also companies where robotic process automation is carried out directly by the business departments). Robotic process automation is usually implemented based on an agile or hybrid approach (a combination of agile and classic approaches, but with the emphasis on the classic one). Enterprises implementing robotic process automation are most often rebuilding processes to be robotically automated only to a limited extent. As for the areas in which software robots are used (question RQ3), the broadly understood support is the dominating area, including financial and HR departments. Some companies, however, are starting to use software robots in direct customer service (e.g. in sales, post-sale service, debt collection). According to the forecasts of the data analytics companies, this trend will intensify. According to the Gartner data analytics company, robots will also be used by 30% of enterprises to handle interactions with customers within the next 3-4 years (Gartner, 2020). In accordance with the respondents' answers, the main factors determining the success of robotic process automation include (question RQ4): a) adopted organizational structure responsible for robotic process automation (in particular, the establishment of the dedicated Center of Excellence), b) implemented principles of selecting and preparing processes to be robotically automated (it is one of the key factors determining the success of the works carried out, mentioned in the subject matter literature), c) building competences among the business personnel on robotic process automation and promoting a pro-innovative organizational culture among the workforce. High quality digital data also plays a very important role in the success of robotic process automation.

The issues related to robotic process automation have found their place as part of the currently emerging interdisciplinary research area - robonomics. It is dealing with advanced automation technologies, in particular with robotic process automation, from the point of view of their impact on the economic and organizational aspects of the functioning of enterprises (Amiot, 2016), (Ivanov, 2017), as it is extremely important to make managers aware of the profound changes that robotic process automation will bring. Those enterprises that neglect the transfer of digital innovations related to robotic process automation to their organizations today may expect a significant deterioration of their market position in the coming years (Gölpek, 2015).

Therefore, the author intends to continue his research in the area of robotic process automation in the future. In particular, he is planning to examine how robotic process automation affects the business models of enterprises and the creation of digital innovations. The other area of the planned research work deals with the impact of robotic process automation on the enterprises' organizational structures and management mechanisms - in particular, on the role, scope of tasks and competencies of managers.

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Andrzej SOBCZAK (PhD) is a Professor at Warsaw School of Economics, Collegium of Economic Analysis, Poland. He is the manager of the IT Manangement Unit operating as a part of the Institute of Information Systems and Digital Economy. He has completed internships at the University of Waterloo (Canada), University of Stratclyde (Scotland), University of Manchester (Great Britain), University of York (Great Britain), Trinity College (Ireland), Center of Health Informatics (Ireland). He has been dealing with digital transformation and digital innovation for several years. His research interests are currently focused on the advanced automation and robotic automation of business processes and services. Research interests: digital transformation, robotic process automation, digital technology adoption, digital innovation.

ORCID ID: https://orcid.org/0000-0002-1271-1251

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THE IMPLEMENTATION OF PERSONNEL PROCESSES IN POLAND AND SLOVAKIA[*]

Milota Vetráková [1], Lukáš Smerek [2*], Katarzyna Włodarczyk [3], Ewa Mazur-Wierzbicka [4], Sandra Misiak-Kwit [5]

[1,2] *Matej Bel University in Banská Bystrica, Tajovského 10, 974 90 Banská Bystrica, Slovakia*

[3,4,5] *University of Szczecin, Management Institute, Cukrowa 8, 71-004 Szczecin, Poland*

E-mails:[1] milota.vetrakova@umb.sk ; [2] lukas.smerek@umb.sk (Corresponding author) ; [3]katarzyna.wlodarczyk@usz.edu.pl ; [4]ewa.mazur-wierzbicka@usz.edu.pl ; [5]sandra.misiak@usz.edu.pl*

Abstract. The year 1989 in the countries of Central and Eastern Europe is associated with the transformation of the economy and the gradual transition from a centrally planned to a market economy. The basis of the transformation process was the privatization of small, medium but also large state-owned enterprises, the formation of a business environment, the application of a liberal approach to the implementation of reforms. More than 30 years have passed since the beginning of the transformation and this is the reason for evaluating the level of human resources management in selected companies. The aim of the paper is to identify new approaches to human resource management and to compare the processes of personnel work in Poland and Slovakia. We conducted the survey in the years 2017 to 2020 using the method of sociological questioning. We obtained the opinions of respondents from 811 companies. In our research, we assume that human resources are the driving force behind the development and performance of companies. Descriptive statistics was used to characterize the sampling unit. To verify the formulated hypothese the Mann-Whitney test was used. The results of the findings are applied in the evaluation of the processes with the highest positive impact on performance. According to the results, there is a statistically significant difference in the implementation of more than 50% of personnel processes in companies in Poland and in Slovakia, and also there are differences in over 50% of tools used in personnel processes in companies in Poland and in Slovakia.

Keywords: Human Resource Management; personnel processes; Poland; Slovakia; companies

1. Introduction

A characteristic feature of the countries of the so-called Eastern Bloc after World War II was a centrally controlled economy. The fulfilment of centrally set indicators and plans was monitored by directive based on administrative decisions. Uniform prices, state ownership of companies, plans adopted for a five-year period brought economic growth in the first post-war years. The continuation of the established directive model of economic management gradually began to manifest itself in the inefficiency of the use of production resources, in the inflexibility and non-innovation of the directive decisions taken. The binding nature of the five-year plans had a negative impact on the estimation of consumer needs, resulting in a shortage of some products and a surplus of others. The advantage of the central economy was social equality, while freedom of enterprise and expression was forbidden. Emphasis was placed on the use of technical and production resources, while the position of employees in the work process was not given sufficient attention. Few employers realized the importance of human for the development of business and society.

After the disintegration of centrally managed economies in Europe, individual countries were gradually moving towards the introduction of a market economy. Economic reform is linked to democratic change and enabled companies to manage their own development democratically. In the work with human resources, the centrally managed personnel policy was restructured in order to emphasize the importance and significance of employing a quality workforce for the company. The problem in introducing changes in personnel work was the insufficient readiness of managers and the lack of experience with the work of people in a market economy. Relatively well-developed personnel work procedures have been maintained in large companies. After their purification from political and ideological goals, they formed the basis for the creation of new techniques and a system of human resource management. The positive experience of human resources managers abroad was also an inspiration for the introduction of new practices in working with people. Open access to information, changes in legislation, increasing mobility abroad, higher expectations and awareness of employees were reflected in the practical implementation of personnel work.

Changes in human resource management processes from 1989 to the present have led us to examine the importance of managing human resources in companies in Slovakia and Poland. The reason for choosing the Polish partner is the fact that it is a country that has the sixth-largest economy in the EU and has a long had a reputation as a business-friendly country with largely sound macroeconomic policies (Poland Economy, 2020). Among the transition countries, it has the largest economy measured by GDP. It is the only EU country to avoid a recession during the financial crisis from 2008 to 2009. As a result of the Corona-19 pandemic, it slid into recession for the first time with a fall in GDP of 8.9% in the second quarter of 2020 (CIA, 2020). Poland and Slovakia are among the countries supporting continuation and further development of Visegrad cooperation. In foreign policy at EU and NATO, Poland acts as an active partner, offering its own solutions and in many respects playing the role of advocate for the interests of other Eastern and Central European countries. Poland is an important trading partner of Slovakia and mutual imports and exports between countries have an increasing tendency.

Through a survey organized in selected companies in Poland and Slovakia, we gain the knowledge about personnel work in analysed countries. The aim of the paper is to compare the processes of personnel work in Poland and Slovakia. On the basis of research results it is possible to determine differences and similarities both in the implementation of personnel processes, but also in tools used in these processes in analysed countries. This paper is organised as follows. Section 2 presents Human Resource Management in Poland and Slovakia. Section 3 shows the methodology and characteristics of the sample. Section 4 illustrates the main results. Section 5 provides the discussion of the findings, and last Section reflects the conclusions.

2. Human Resource Management in Poland and in Slovakia

After 1989, personnel work in Slovakia underwent significant changes brought about by the transformation of the economy and the democratization of society. The three countries of the Eastern bloc, Czechoslovakia, Poland and Hungary, with regard to the level of economy and society, had the greatest integration potential. In 1991, the main state officials signed the Visegrad Declaration on mutual cooperation, thus establishing a group called V3. The activities of the three countries were also reflected in the signing of bilateral European Association Agreements with the European Community in 1991. In 1992, they established the Central European Free Trade Agreement (CEFTA) with the aim joining the European political, economic, security and legal system and consolidating democracy and the free market. Following a mutual agreement between the main political representatives of Slovakia and the Czech Republic, Czechoslovakia was divided in 1993. The Slovak Republic was accepted by its neighbours and the international community as an independent republic, and co-operation of the Eastern bloc countries has been under way within 2003. The OECD has offered Hungary, Poland, the Czech Republic and Slovakia assistance in transforming their economies into market economies so that they can integrate into OECD countries. In 2004, the Czech Republic, Hungary, Poland and the Slovak Republic became members of the EU. Much of CEFTA's foreign trade is with the EU. Nevertheless, the transformation is not only associated with the creation of a business environment, with the formation of new legal and institutional mechanisms, but also a change in thinking and behaviour of people in the role of employees, managers and owners and thus a new generation of managers and other employees able to work in the market environment and multinational companies were formed (Lincényi, Mindár, 2021). Finally, thanks to the implemented reforms, Slovakia gained the trust of foreign investors. Significant foreign capital is entering the emerging business environment of the Slovak economy. Experience with market economy management, new forms of work organization were used not only by multinational but also by local companies.

Simultaneously with the inflow of new foreign investments, holders of know-how are also coming to Slovakia, who also influence personnel work in multinational companies. The competitiveness of the environment is growing. Employers are placing increasing emphasis on the selection, stabilization, training and development of employees with development potential. Managers and staff must fully comply with the requirements of the positions and are hired only if they pass all rigorous examinations. By no means do companies compromise on anyone or lower standards (Guo, 2016).

On the other hand, a loyal factor of staff turnover as a criterion for an effective human resources policy is a deterrent to employee turnover and a prerequisite for the successful operation of the company (Semenovna Morozova et al., 2016). In general, it can be said that individual human resource management activities have started to be produced more efficiently to meet the needs of companies and employees themselves. The trend towards a holistic approach to working with people in the work process is observable. This new direction of personnel work expresses the importance of man, the human workforce as the most important factor of production. At the same time, this creates pressure on the job market, because better personnel work offers more lucrative jobs, which represents a competitive efficiency for the company. As a result of the mentioned changes, certain new trends and tendencies also began to appear in personnel work in Slovakia, which fundamentally change the usual way of performing individual personnel activities. The importance of human resources and their management in the company is declared. The validation of the above axiom was the subject of research at Matej Bel University in Banská Bystrica, which has been carried out since 1997. Repeated research revealed the most common problems of managers with the implementation of personnel work. According to them, there is a lack of qualified job seekers and employees willing and able to work. The opening up of the labour market has not eliminated the problem of a shortage of skilled labour in the required structure – despite the high unemployment

rate, employers are announcing the problem of a shortage of candidates for many jobs. Insufficient work discipline and communication, declining reliability and responsibility, dissatisfaction with remuneration, increasing demands of employees are reflected in reduced employee performance and increased turnover. Instead of conceptual issues of personal work, managers have to solve every day work problems. Despite the declared importance of human resources for gaining success and competitive advantages in the market, personnel work in the conditions of Slovakia does not receive the declared attention. Managers and business owners focus on material, technical and financial security and underestimate the care for the acquisition, development and use of employee potential. They do not realize that the best and most successful business distinguishes the level of personal work from others. Employees are looking for companies that have a good reputation and are financially stable (Vetráková et al, 2017).

In Poland, as in Slovakia, in 1989 the economy changed radically. In 1989/1990 started-up of the market mechanism in the Polish economy and caused changes in the labor market, too. A competitive labor market was created. Employers began to follow the economic calculation and employ employees optimal from the point of view of the company's interests. In effect of market mechanisms in the Polish economy was great decline in job offers and increase in dismissed people. The changes in the Polish labor market were influenced by the directions of economic reforms introduced at the beginning of the 1990s. The directions of these reforms were: creating the foundations of the market mechanism and liberalization of the economy, withdrawal of the government from regulating wages and employment in enterprises, shaping minimum wages, changes in income taxation, building a system of information about the labor market, job placement, social protection of the unemployed and the privatization process that was expected to have a positive impact on resource allocation, including work (Sztanderska, 1993).

The first decade of changes did not have a positive effect on the Polish labor market. The ways to change this situation was seen in privatization, restructuring and Poland's accession to the European Union. With Poland's accession to the EU, in 2004, new challenges appeared in the labor market related to the increase in productivity and the economy's ability to create new jobs. The Polish labor market has become part of the European labor market with free movement of workers (Wiśniewski, Dolny 2008).

After Poland's accession to the EU, in the period 2004–2010, there are two specific periods from the point of view of the situation on the Polish labor market. In the years 2004-2007 high economic growth resulted in positive changes as well as an increase in employment and a decrease in unemployment. In turn, from 2008 to 2010, when the economic situation worsened, problems appeared on the Polish labor market. Their main measure was the decline in the employment rate (Pasierbiak, 2012).

The following years of development of the Polish economy showed other growing problems on the labor market, too. Market research and analyzes conducted in Poland in 2010-2015 indicated that the main problems were: competency mismatch, the situation of women on the labor market, the situation of young people on the labor market, extending the duration of professional career and the problem of lifelong learning (Górniak, 2015).

Summing up, it can be said that the Polish labor market has changed significantly over the last thirty years. First of all, unemployment has fallen and salaries have increased during this time. However, changes in the labor market were not positive only in this period. The rapidly growing unemployment was the greatest pain on the Polish labor market in the first years of transformation. Since 1990 unemployment was growing year by year. The apparent stabilization took place only in 1995. However, the number of unemployed continued to increase in the following years, until 2004. Since 2004, unemployment in Poland has been dropping to below 10% in 2008. Unfortunately, the economic crisis has led to a renewed trend in rising unemployment. The highest level of unemployment was recorded in 2014 but since then it has been constantly falling. In the analysis of the Polish

labor market important information are data of increasing average and minimum wages since 1995, too. From 2015 to 2019, the Polish labor market changed even more. Stable economic growth translated into a very good condition of the labor market. The unemployment rate is very low. Poles' salaries are also growing. The actions taken by the government are improving the situation of the underpaid (GUS, 1990-2020, 2006, 2010, 2012, 2015, 2017, 2019).

The transformations of the last decade on the Polish labor market also affect aspects related to human resource management. From the point of view of this study, practices in the field of human resource management used in Polish companies should be presented. The main issues that should be taken into consideration in contemporary human resource management in an organization are: an influence of new technologies in HR supporting, a decrease in unemployment, new and numerous highly specialized positions, constantly growing number of job offers. The Deloite Global Human Capital Trends research from 2019 conducted in Poland may be a signpost for future directions of changes in the field of HRM in Polish companies. Activities in the field of HRM should focus on: intensifying alternative forms of employment, designing positions and professional careers of employees, developing talents, the ability to combine experience and innovation, more frequent implementation of teamwork, implementation of various employee learning paths, and developing the new technologies in HR processes (Deloitte, 2019).

Despite many similar features between the two countries, it is clear that there are significant differences in the implementation of personnel processes. Based on these differences, 2 research hypotheses were formulated as follows:
H1: We assume that there is a statistically significant difference in the performing of more than 50% of personnel processes in companies in Poland and Slovakia
H2: We assume that there are differences in more than 50% of the tools used in personnel processes in companies in Poland and Slovakia.

3. Methodology

Data collection about HRM in companies in Poland and in Slovakia was carried out by the method of sociological questioning using online and print questionnaires. The questionnaire contained 24 questions focused on HRM processes, including problems and proposals for measures to change and trends in the development of personnel work. We obtained the data in person or online from human resources departments and persons responsible for personnel work in companies. The aim if the study was to compare the processes of personnel work in Poland and Slovakia. First partial aim was to determine in which areas are located divergences in the implementation of personnel processes in companies in both countries. Second partial aim was to analyse the usage of tools in personnel processes in Poland and Slovakia. In this regard it was crucial to define similarities and differences of application of these tools.

The survey was conducted from October 2019 to April 2020 in Poland. The base of Data Smart company constituted the sampling frame of the organisations in Poland. The first invitations to participate in the survey were sent to 4000 companies in Poland. Due to a low return of completed questionnaires additional invitations were sent to 376 companies. In total, the invitations were sent to 8000 companies in Poland, out of which 430 (7,34%) agreed to participate in the study and submitted correctly completed questionnaires. The number of incomplete or incorrect questionnaires is 51. The survey was conducted from October 2017 to August 2019 in Slovakia. The invitations to participate in the survey were sent to 4000 companies in Slovakia, out of which 381 (9,53%) agreed to participate in the study and submitted correctly completed questionnaires.

The number of incomplete or incorrect questionnaires is 72. The breakdown of the surveyed enterprises by size and sector is shown in Table 2.

Table 2. The characteristics of the research group

	Poland		Slovakia	
	No.	%	No.	%
Size				
< 10	100	23,26	87	22,83
1– 49	113	26,28	110	28,87
50 – 249	93	21,63	120	31,50
250 >	124	28,84	64	16,80
Sector				
Private sector, including non-profit organisations	326	75,81	336	88,19
Public sector, including state institutions	104	24,19	45	11,81
Total	430	100	381	100

Source: Own calculations based on conducted research.

Table 2 ilustrates the size and sector distribution among the sample group in numbers and in precentages. According to the presented data, the low degree of differentiation in respondent replies can be observed when comparing size of entreprises in Poland. The group of respondents is more varied if we take into consideration the sector.

We used the Mann-Whitney U test to process the obtained data needed to verify the hypotheses. The Mann-Whitney U test can be used to answer the questions concerning the difference between groups. This test has the great advantage of possibly being used for small samples of subjects. In the field of behavioural sciences, the Mann-Whitney U test is one of the most commonly used non-parametric statistical tests (Kasuya, 2001). Its null hypothesis (H0) assumes that the two groups come from the same population. In other words, it assumes that the two independent groups are homogeneous and have the same distribution. The alternative hypothesis (H1) against which the null hypothesis is tested assumes that the first group data distribution differs from the second group data distribution. The Mann-Whitney test is based on the comparison of each observation from the first group with each observation from the second group (Nachar, 2008). We performed testing at a level of significance of 95%.

4. Results

The Mann-Whitney U test was used for personnel processes to assess the statistical significance of the difference between the implementation of processes in the Poland and the Slovak Republic. Table 3 shows the Mann-Whitney U test values, critical values and p-values comparing the implementation of each process in Poland and Slovakia. The last 2 columns show the percentage of the implementation of each HRM process in each country.

Table 3. The difference in the performance of HRM processes

Performed processes	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)	PL	SK
Developing strategies, policies, and other plans	71520.500	-3.637	0.000*	62.56%	49.87%
Employee number and structure planning	77512.500	-1.648	0.099	66.28%	71.65%
Job analysis	78751.500	-1.111	0.266	59.77%	55.91%
Selection of employees	63341.500	-7.879	0.000*	68.14%	90.81%
Employee recruitment and adaptation	72306.000	-4.197	0.000*	74.88%	86.61%
Training and further education	71340.000	-4.283	0.000*	69.77%	82.68%
Talent management	73484.500	-3.458	0.001*	28.14%	17.85%
Job evaluation (payroll system creation)	64912.500	-5.906	0.000*	56.98%	36.22%
Employee welfare	64014.000	-6.651	0.000*	57.67%	79.53%
Employee evaluation	72445.000	-3.693	0.000*	67.44%	79.00%
Release of employees (termination of employment)	79668.500	-0.780	0.435	54.19%	51.44%
Personnel controlling	69852.500	-4.426	0.000*	26.74%	41.47%
Personnel administration	58231.000	-8.501	0.000*	49.30%	78.22%

* Statistically significant difference at the 0.05 level (2-tailed).

Source: Own processing based on conducted research.

The calculated critical values and p-values show that there are 3 HRM processes, the implementation of which did not confirm a statistically significant difference between companies in Poland and Slovakia. These processes are employee number and structure planning, job analysis and release of employees. In all other processes, we identified statistically significant differences.

Table 4 shows the Mann-Whitney U test values, critical values and p-values comparing the implementation of tools in Poland and Slovakia. The last 2 columns show the percentage of the implementation of each tool in each country.

Table 4. Tools used in personal processes in companies in Poland and Slovakia

Tools		Mann-Whitney U	Z	Asymp. Sig. (2-tailed)	PL	SK
Tools		Mann-Whitney U	Z	Asymp. Sig. (2-tailed)	PL	SK
Recruitment tools						
Print		66660.500	-6.292	0.000*	14.19%	32.81%
1.	Electronic	78487.000	-1.219	0.223	59.07%	63.25%
2.	Labour Office	72435.500	-3.971	0.000*	16.51%	28.08%
3.	Database	75464.500	-2.697	0.007*	18.37%	26.25%
4.	Direct	77861.000	-1.458	0.145	39.07%	34.12%
5.	Friends	70257.500	-4.046	0.000*	45.35%	59.58%
6.	Agency	78677.000	-1.392	0.164	22.33%	18.37%
7.	Intermediaries	73612.000	-5.230	0.000*	13.02%	2.89%
8.	Open door days	79093.000	-2.016	0.044*	7.91%	4.46%
Selection tools						
1.	Documentation	76052.500	-2.762	0.006*	87.21%	80.05%
2.	IQ test	75418.500	-3.426	0.001*	8.60%	16.54%
3.	Skills test	79380.500	-0.963	0.336	28.14%	31.23%
4.	Personality test	77895.000	-2.013	0.044*	11.63%	16.54%
5.	Expertise tests	56202.000	-11.605	0.000*	3.26%	34.65%
6.	Structured interview	79157.000	-0.969	0.333	40.47%	43.83%
7.	Unstructured interview	68742.000	-4.689	0.000*	31.16%	47.24%
8.	AC	81550.500	-0.256	0.798	6.74%	6.30%
9.	Other	80415.500	-2.356	0.018*	2.09%	0.26%

Adaptation tools					
1.	Job rotation	76890.500	-2.039	0.041*	21.16%	27.30%
2.	Programs	77626.500	-1.856	0.064	22.56%	17.32%
3.	Projects	77049.500	-2.179	0.029*	21.16%	15.22%
4.	Tutoring	71779.000	-3.534	0.000*	39.07%	51.44%
5.	Water	79711.000	-1.084	0.278	15.81%	13.12%
6.	Examples	69148.000	-5.499	0.000*	13.02%	28.61%
7.	Other	80932.500	-1.308	0.191	1.16%	2.36%
8.	Not planning	69399.500	-5.332	0.000*	28.14%	12.86%
Learning and development tools					
1.	Lectures	72992.500	-3.111	0.002*	50.00%	60.89%
2.	Video	75509.000	-3.295	0.001*	16.74%	8.92%
3.	E-learning	68273.000	-5.269	0.000*	35.81%	19.16%
4.	Instructing	78852.000	-1.062	0.288	52.56%	48.82%
5.	Role plays	80829.000	-0.880	0.379	4.19%	5.51%
6.	Coaching	73807.000	-3.185	0.001*	21.86%	31.76%
7.	Self-education	81407.500	-0.176	0.860	52.33%	51.71%
8.	Model	67531.500	-6.457	0.000*	10.00%	27.56%
9.	Other	78105.000	-4.260	0.000*	4.65%	0.00%
Controlling tools					
1.	Operative	73796.000	-3.052	0.002*	26.05%	35.96%
2.	Strategic	74410.000	-2.825	0.005*	34.88%	25.72%
3.	No	73284.000	-3.015	0.003*	39.07%	49.61%

* Statistically significant difference at the 0.05 level (2-tailed).

Source: Own processing based on conducted research.

The analysis of the data shows that in total, among all tools used in personal processes taken into account in the research, statistically significant differences between companies in Poland and Slovakia were noted for 67% of tools. 100% of statistically significant differences occurring between companies in Poland and Slovakia were observed for tools concerning personnel controlling.

Electronic advertisement was considered the best recruitment technique, both in Polish and Slovakian companies: 59.1% and 63%, respectively, whereas friends, acquaintances: 45.4% and 59.6%, respectively. In turn, open door days (7.9%) and intermediaries (2.9%) were considered the least beneficial recruitment techniques by Polish and Slovakian companies, respectively.

For selection methods, Polish companies mostly used selection according to the applicant's documentation (CV, questionnaire, references) (87.2%) and the structured interview (40.5%), while testing expertise (3.3%) was used least often. Slovakian companies, when it comes to the outlined selection methods, applied selection according to the applicant's documentation (CV, questionnaire, references) (80.1%) and the structured interview (47.2%), while testing expertise (6.3%) was used least often.

Tutoring and guidance (39.1%) was named as the most frequently used tool by Polish companies at the stage of employee adaptation. As many as 28.1% of companies did not plan to apply any new tools allowing the employee to adapt to the new work place or a new post. Whereas three tools were used to a similar degree, that is: planned work programs (22.6%), job rotation and special tasks/projects, each 21.2%. Illustrative examples (13%) proved the least popular. A situation in the field of using tools for employee adaptation looked slightly different in Slovakian companies. Now, as in the case of Polish companies, the tool used most frequently was tutoring and guidance (51.4%) - it needs to be noticed that this tool is much more popular among companies in Slovakia than in Poland. Illustrative examples (28.6%) came second - least appreciated by Polish respondents. Slovak companies least frequently pointed to the tool called: "throw into the water, where the deepest" (13.1%). A

similar percentage of Slovakian and Polish companies did not plan to use any tools allowing the employee to adapt in the new work place (12.9%).

The methods of employee training most often used in Polish companies included instructing 52.6%, self-education (52.3%) and course/lecture (50%), while role playing (4.2%) was used the least often, similar to Slovakian companies (5.5%). Course/lecture (60.9%) and self-education (51.7%) were put into operation the most in Slovakia, which is similar to companies in Poland.

For personnel controlling, as many as 39.1% of Polish companies and 49.6% Slovakian companies did not apply any methods. Among companies in Poland which used tools of personnel controlling, the strategic controlling (surveys, audits) (34.9%) was most popular, opposite to Slovakian companies, who pointed to operative controlling (indicators) (36%) more often.

Table 5 shows the Mann-Whitney U test values, critical values and p-values comparing the implementation of strategy and personnel work responsibility in Poland and Slovakia.

Table 5. Personnel work responsibility and formalised strategy in companies in Poland and Slovakia

Personnel work responsibility					
	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)	PL	SK
Owner	79767.000	-0.832	0.405	26.51%	29.13%
HR	64605.000	-6.007	0.000*	58.14%	37.01%
Line manager	77971.500	-4.035	0.000*	0.70%	5.51%
Top manager	73132.500	-4.896	0.000*	5.81%	16.54%
Economist	62094.000	-8.970	0.000).	6.51%	30.71%
Other	78690.000	-4.151	0.000*	0.00%	3.94%
Formalised strategy					
Yes	66221.500	-5.459	0.000*	55.12%	35.96%

* Statistically significant difference at the 0.05 level (2-tailed).

Source: Own processing based on conducted research.

Among the Polish companies, the HR department (58%) was most often pointed as a unit responsible for personnel processes, as was the case among Slovakian companies, though the percentage was lower (37%). The owner came second in Poland (26.5%), whereas the wage (economic) department (30.7%) ranked second in Slovakia. The research shows that about every second investigated organization from has a formalized strategy for human resources management. For Slovakian companies, only 36% of respondents have such a strategy in place.

5. Discussion

Human resources today are crucial for effective functioning of every organization which brings measurable effects. According to R.W. Griffin: "Human resources management used to be classed under secondary tasks in many organizations, but its significance has grown within the last two decades. This results from the growing complexity of the legal matter, from recognizing that human resources are a means to improve efficiency and from realising the costs associated with their inadequate management" (Griffin, 2013). It is visible in the evolution of the attitude towards HRM (also in organizations) from administering, to managing personnel, to human resources management, to strategic HRM/HCM, to strategic international HRM (Kaufman, 2014; Mura et. al, 2019; Obedgiu, 2017; Lucas, Grant, 2018).

Therefore, it may be assumed that contemporary human resources management plays a strategic role. Which is why HRM practices should be considered in the context of strategic human resources management. The resource-based view has provided a basis to its development (Beer et.al, 1984; Boxall, 1996, Lepak, Snell 2002, Boxall, Purcell, 2016). The conviction about the fundamental role of the organization's internal resources as competition factors has substantiated a statement that people have strategic importance to the success of the organization which creates the possibility of gaining and maintaining competitive leverage. It is because they have resources features attributed to those of a strategic nature, which is why they should be: rare, valuable, difficult to imitate and without substitutes (Listwan, 2010). Individual processes occurring in the framework of HRM should also be examined in this context (Tracey, 2014). More and more organizations are inclined towards HRM in the strategic approach (Marka, Bax, 2002; Cheng, Cooper, 2003; Becker, Huselid, 2006; Storey et.al, 2019; Ahammad et.al, 2020; Portela, 2020; Laužikas, Miliūtė, 2020; Knezović et.al, 2020).

Results obtained in the research point out the existence of differences both in the implementation of personal processes in companies in Poland and Slovakia, but also in tools used in these processes.

Implementation of individual processes, HRM elements, has been addressed in a number of studies, those concerning the aspects of the organization at the level of individual countries (Pološki, Vokić, 2004; Mazurkiewicz, 2010; Liang et.al, 2010; Li et.al, 2011; Pingle, 2014; Cooke et.al, 2019; Jarecki et.al, 2020), and those concerning international comparisons made between them (Budhwar et.al, 2017; Chen et.al, 2018; Ayentimi et.al, 2018; Łobos et.al, 2020). However, there has been no research that would compare, in the scope presented in this paper, the implementation of the HRM process and the tools used as part of them in companies in Poland and Slovakia. This study fills this gap.

The research falls under the positivist (functional) mainstream. It has substantial dominant presence in the area of HRM (Samul, 2016). Reasons for this may be sought in emphasizing values applied in investigating (neo)positivist methods which mainly involve examining the cause-and-effect relationships, the use of statistical tests and linear thinking (Brewster1999; McKenna et.al, 2008). Research on HRM in the positivist mainstream is usually conducted from the perspective of the institutional theory or resource-based view, mainly in the area of strategic human resources management (cf. research by: Becker, Huselid, 2006). HRM-related research is also undertaken in the interpretative mainstream and also, though relatively rarely, in the post-modern and critical angle (Mesjasz, 2003; McKenna et.al, 2008; Sułkowski, 2009).

When taking up a discussion in the framework of research on the functioning HRM in organizations in Poland and Slovakia, and when adopting the research hypothesis as a starting point, it needs to be concluded, that:
Hypothesis - H1: "We assume that there is a statistically significant difference in the performing of more than 50% of personnel processes in companies in Poland and Slovakia" - was verified positively.

The analysis shows statistically significant differences between companies in Poland and in Slovakia were observed in 10 out of 13 HRM processes identified in the research (i.e. 77%). The analysis of data included in Table 3 shows that the greatest differences (taking the % of implementation of HRM processes as a starting point) occur for the processes concerning: personnel administration, selection of employees, employee welfare - implementation % higher in Slovakian companies, job evaluation (payroll system creation) - where the % of implementation is higher in Polish companies.
Hypothesis - H2: "We assume that there are differences in more than 50% of the tools used in personnel processes in companies in Poland and Slovakia"- was verified positively.
When adopting the analysis done at the beginning of the discussion, presented state of affairs points to the needs to put a lot of effort by Polish and Slovakian organizations to direct their activity undertaken under human resources towards their strategic management (cf. Marka, Bax, 2002; Knezović et.al, 2020).

Conclusions

Efficient human resources management today requires the understanding of all issues relating to the operation of the company and to the adaptation of personnel strategy and policy to the needs of the organization. The process carried out as part of HRM and the relevant tools used alike take an important place.
The aim of the paper was to compare the processes of personnel work in Poland and Slovakia. First partial aim was to determine in which areas are located divergences in the implementation of personnel processes in companies in both countries. Second partial aim was to analyse the usage of tools in personnel processes in Poland and Slovakia. On the basis of research results it was possible to determine differences and similarities both in the implementation of personal processes, but also in tools used in these processes in analysed countries. It was possible by means of a critical analysis of the subject-matter as well as inference on the basis of analysis based on the data obtained from the research addressing the operation of HRM in companies in Poland and in Slovakia.

The research hypotheses were verified as positive in the course of the analysis. Therefore, it is true that there is a statistically significant difference in the implementation of more than 50% of personnel processes in companies in Poland and in Slovakia, and also that there are differences in over 50% of tools used in personnel processes in companies in Poland and in Slovakia. We would also like to mention the limitations of the study. The research process in Poland was hindered by the epidemiological situation. After March 2020 companies faced a lot of unforeseen problems which negatively influenced the motivation to participate in the study. Despite these limitations, research results can be a solid basis for further studies. The recommendation would be to conduct complementary, qualitative research to analyse in details current problems and barriers that companies face in HRM.

When wrapping up the reflections presented in this study, it may be concluded that:
- after 1989, the approach to the personnel policy in organizations has undergone significant changes both in Poland and in Slovakia and there has been a shift towards the model of strategic human resources management,
- despite the fact that strategic HRM is today the most desired approach to human resources in the organization, only 36% among the investigated entities in Slovakia and 55% in Poland had a formalized strategy for human resources management,
- there are significant differences in the implementation of personnel processes in companies in Poland and in Slovakia and in the tools used by them in these processes, i.e.
  - for processes in Polish companies, greater emphasis was placed on employee recruitment and adaptation (74.9%) and training and further education (69.8%), and lesser emphasis was placed on personnel controlling (26.7%), whereas in Slovakian companies the greatest degree of implementation was seen in the selection of employees (90,8%), employee recruitment and adaptation (86,6%), and the least in talent management (17.9%);
  - for tools, the greatest differences were seen in the field of: personnel controlling and selection.

Based on the findings, it would be appropriate for companies in both countries to invest more effort into formulating a formal HRM strategies. Likewise, it would be beneficial for companies to implement processes that are associated with strategic HRM, such as job analysis, personnel planning, personnel controlling, talent management. Their underestimation can cause various problems in personnel work in long-term. Although, this assumption requires further in-depth investigation and will be the subject of future research.

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Milota VETRÁKOVÁ is the Professor of Tourism at the Faculty of Economics, Matej Bel University in Banska Bystrica, Slovakia. Her profesional orientation is mainly on Human Resource Management in Tourism, Communication of Managers, Organizing Work and Managing of Human Resources. Her research focuses on the specifics of international human resource management and convergence and divergence in the management of multinational companies. She has had moer than 25-year experience of working at significant positions in the Faculty of Economics and Matej Bel University.
ORCID ID: orcid.org/0000-0001-7837-5118

Lukáš SMEREK is an assistant professor at the Faculty of Economics, Matej Bel University in Banská Bystrica, Slovakia. His research interests include the issues of human resources management, human resources development, international human resources management, corporate culture and managerial communication. He has had the experience of working as a professional lecturer providing lectures, courses and trainings to the employees mainly in field of human resource management and soft skills.
ORCID ID: orcid.org/0000-0003-0008-282X

Katarzyna WŁODARCZYK is a professorat the Faculty of Economics, Finance and Management, University of Szczecin, Poland. Her main research areas are: economics, microeconomics, consumers' behaviour, quality of life, management, management of human resources, and communication in organisation, globalisation, entrepreneurship and negotiations. She is an author of over 150 publications written in Polish and English. She has actively participated in over 80 national and international conferences. She has been a member of organising committee and a member of programme board of national and international scientific conferences. She has participated in international projects as member and coordinator. She was on the research stays in: France, Germany and Italy. She conducts (in Polish and English) more than 10 different courses in the field of management and economics.
ORCID ID: orcid.org/0000-0002-6020-8378

Ewa MAZUR-WIERZBICKA is a professor of the University of Szczecin, Faculty of Economics, Finance and Management. She specializes mainly in the field of human resource management, corporate social responsibility (CSR) (with emphasis on diversity management, ethical and equality-related actions) and sustainable development. She also deals with the issues of soft competences. She is an author over 200 publications written in Polish and English. Member of the Expert Forum of the European Institute for Gender Equality. An expert in the field of CSR– external expert of the Responsible Business Forum. University of Szczecin's plenipotentiary to the Technical Committee no. 305 for Social Responsibility operating at the Polish Committee for Standardization, advisor of the Polish Agency for Enterprise Development in terms of Corporate Social Responsibility. Business consultant. She cooperates with practitioners in the field of management, training companies and institutions.
ORCID ID: orcid.org/0000-0001-7874-6417

Sandra MISIAK-KWIT is an assistant professor at the Faculty of Economics, Finance and Management, University of Szczecin, Poland. Her main research areas are entrepreneurship, self-employment, human resources management, negotiations, co-creation, stress and diversity management and communication. Altogether, she conducts (in Polish, English and German) more than 20 different courses in the field of management and economics. She is co-founder and coordinator of Winnet Centre of Excellence® – the international network of researchers for the purpose of doing and promoting teaching, policy making and research on Gender, Innovation and Sustainable Development (http://wce.usz.edu.pl/). She has extensive experience in international research. She was a holder of worldwide scholarships in Canada, China, Finland, Georgia, Germany, Sri Lanka, Turkey and Ukraine. She is an author of several dozens publications written in Polish and English
ORCID ID: orcid.org/0000-0002-0621-7097

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SLOVAK BUSINESS ENVIRONMENT DEVELOPMENT UNDER THE INDUSTRY 4.0 AND GLOBAL PANDEMIC OUTBREAK ISSUES[*]

Adriana Grenčíková [1], Valentinas Navickas [2], Marcel Kordoš [3], Matej Húževka [4]

[1,2,3,4] Alexander Dubček University in Trenčín, Študentská 2, Trenčín, 911 50, Slovak Republic

E-mails: [1]adriana.grencikova@tnuni.sk ; [2]valna@ktu.lt ; [3]marcel.kordos@tnuni.sk ; [4]matej.huzevka@tnuni.sk

Abstract. The current global crisis, triggered by the spread of the Covid-19 virus, is associated with the economic slowdown in many countries as well as global economy. The presented study deals with the social and economic impacts of a coronavirus pandemic issue on economic environment within Slovak companies and other organizations. Based on the executed e-questionnaire survey analysis, the main goal of the paper is to assess the opinions of workers in different types of companies, while the key parameter is the intensity of impacts on the economy development. The survey was conducted within the period of 30th September to 14th October 2020, it involved 302 respondents and provides data on how different groups of people perceive the current situation from the status of an employee - women, men, different age categories, inhabitants of individual regions in Slovak Republic. The data assessment output reveals the selected labor market trends in terms of new employment possibilities. At the same time, the paper demonstrates a relatively negative economic period within the Slovak society, while mapping the overall macroeconomic situation in Slovak Republic and world economy, caused by the global covid-19 pandemic outbreak. Results show that the Industry 4.0 elements adequately incorporated into the organization of labor are the correct tools to handle the current economic crisis affected by pandemic outbreak within the Slovak entrepreneurship environment.

Keywords: home office; work organization; information and communication technologies; Covid-19 pandemic; international economics

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1. Introduction

According to Toth, Maitah, Maitah, K. (2019), Besenyő, Kármán, (2020) and Wójcik, Ioannou (2020) since the beginning of 2020, the term Covid-19 has gradually become a society-wide phenomenon, which has made us realize how unstable and difficult it is to predict the environment in which we live and work. Although the pandemic initially was profiled primarily as a health problem, the diversity of its effects was already apparent after a few weeks. Emerged multilateral changes have caused the civilized world began to understand this pandemic issue as a crisis. Just as the Great Depression of the 1920s and 1930s or the Global Financial Crisis (Great Recession) of 2008 and 2009, the current crisis, characterized by the spread of the Covid-19 virus, is associated with the economic slowdown in particular countries as well as global economy (Hnát, Zemanová, Machoň, 2016; Maitah, Smutka, 2019; Leduc, Liu, 2020). The difference between the three mentioned crises lies mainly in the causes of their occurrence - while the first ones were the result of problems culmination in financial markets, the primary cause of the current crisis is the spread of contagious respiratory disease, which paralyzes the possibility of social interaction - whether study, work or leisure (Nenckova, Pecakova, Sauer, 2020). Dudáš, Grančay (2019) and Gärtner, Sadílek, Zadražilová (2017) argue that if the cooperation of people is understood as a necessary element for the functioning of their economic and social life, then the consequent restriction of physical contact has economic, social and also psychological manifestations. At the same time, the circumstances that can be seen today significantly underline the significance of Industry 4.0 elements such as communication technologies and artificial intelligence as an essential part of people's lives and society (Grmelova, 2018a; Hanulakova, Dano, Drabik, 2019). The different views of economists and relevant institutions on the pandemic issue development, especially the economic impact, can be summarized in three basic statements. The first is the general belief that the current crisis is primarily the result of an ongoing pandemic and will be deeper but probably shorter than the previous one (Gräbner, Heimberger, Kappeler, 2020; Tajtakova, Zak, Filo, 2019; Thivant, Machková, 2017). The second group of authors such as Krajňáková, Vojtovič (2017) and Roškot, Wanasika, Kreckova Kroupova (2020) underline the fact that the prognostic trends before the pandemic outbreak have already indicated an impending economic recession, but with the emergence of pandemic just accelerating the activation of these processes. The crisis of larger proportions is indicated by the long-term accumulation of risk trends, such as high fiscal deficits and public debts, demographic development in developed countries, growing risk of deflation and commodity price collapse along with currency depreciation, digital economic disruption associated with extending social disparities, deglobalization in terms of protectionist measures and export restrictions, the decline of democracy as a result of economic uncertainty and propensity for populism, geostrategic distance between the USA and China, etc. (Lipkova, 2018; Svacina, Rýdlová, Bohácek, 2018). The third observation is determined by theoretical threats - there is a realistic assumption that liquidity problems of households, businesses and government organizations will result in a chain reaction in terms of insolvency and bankruptcy, resulting in a vortex of financial and economic crises within the global economy (Saroch, Smejkal, 2018; Jiránkova, 2012).

The presented study analyzes the impacts of Covid-19 pandemic on work organization within the Industry 4.0 concept in companies operating in Slovak Republic and on the employees within these entities. The real-status detection provides us with the information necessary for further analysis of rate development and, in particular, analysis of potential impact on labor market. Therefore, the main goal of the research, presented in the paper, is to reveal and estimate the effect of Slovak entrepreneurship environment being able to adopt to particular measures regarding the current global pandemic outbreak. Additionally, we estimate if this change is to result in any massive outflow of workers or the emergence of new jobs. The data collected aim to bring specificity to the discussion and open up opportunities for further action by providing perspective to human resource managers at strategic employers, who are among the leading players in new trends and are key players in the implementation of future workforce strategies. For these reasons, we have been dealing with this issue for several years being the solvers of the Slovak Ministry of Education research grants Vega 1/0430/18 and Vega 1/0462/20. The object of

interest of the research was the opinion of employers on the actual development in companies. The conducted research was focused mainly on technical problems and solutions, and there were the views being introduced in Slovakia to this issue that drew attention in a different direction to the impact on labor market and other changes being brought by. The outline of this paper features in Section 1 a short introduction and a literature review in Section 2, followed by the proposed goal and research methodology in Section 3. Finally, the results are presented and consequently discussed in Section 4 and ended up by brief conclusions in Section 5.

2. Theoretical background

In January 2020, the first reports regarding the spread of Covid-19 in mainland China appeared in the media. It was expected to be a local epidemic only. Only the first cases in the south of Europe and on other continents made most countries pay attention to the disease and its impact on the economy. To prevent the transmission of the virus, most states have restricted their trade, services, transportation links and contacts with foreign countries (Shehzad, Xiaoxing, Kazouz, 2020; Zemanova, Drulakova, 2020). Already in the first quarter of 2020, the first symptoms of the approaching economic recession appeared - Slovak GDP decreased by 3.7% year-on-year, in the second quarter of 2020 even by 12.1%. A similar situation was faced by the entire EU economic bloc - in the first quarter, EU GDP fell by 2.7% year on year, in the second quarter by even 14.4%. To better illustrate the effects of the Covid-19 pandemic on the economy, the Figure 1 presents the GDP development of selected countries and EU in a year-on-year comparison for the last quarter of 2019, the first and second quarters of 2020.

	Slovakia	Czechia	Germany	EU	USA	China	Russia	India	Japan
■ 4Q/2019	2	1,8	0,4	1,2	2,1	6	2,1	3,1	-7,1
■ 1Q/2020	-3,7	-2	-2,2	-2,7	-4,8	-6,8	1,6	3,1	-3,4
■ 2Q/2020	-12,1	-10,7	-11,3	-14,4	-32,9	3,2	-8	-23,9	-28,1
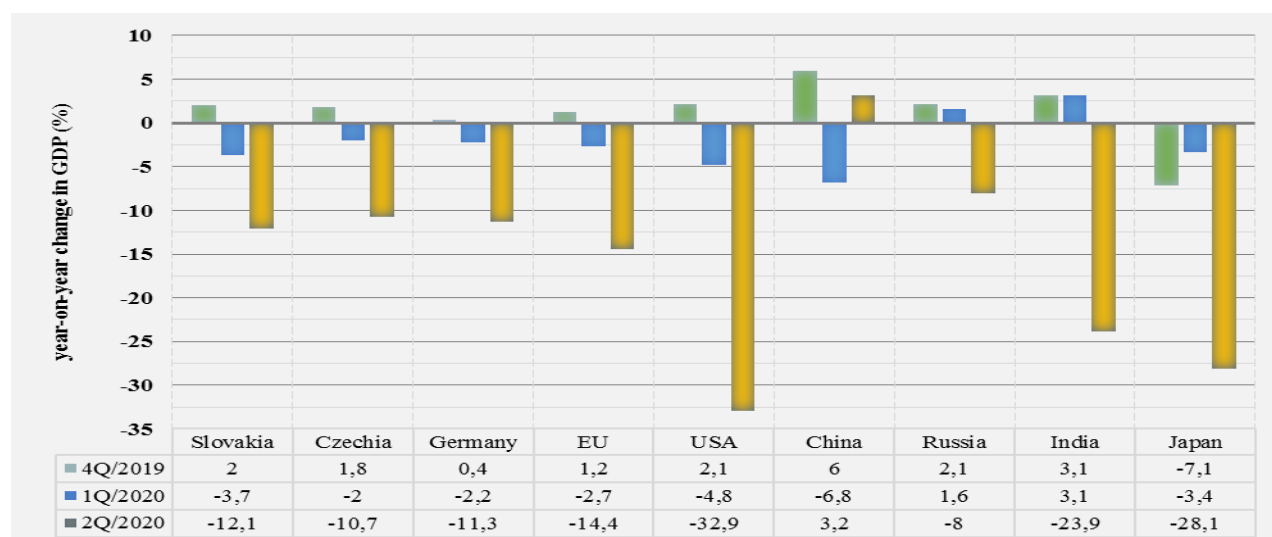
Figure 1. Year-on-year changes in GDP in 4Q / 2019, 1Q / 2020 and 2Q / 2020 - comparison of selected world economies (Q - quarter)

Source: own processing by Our World in Data (2020) and Slovak Statistical Office (2020)

According to Fabus (2018) Slovak economy is too small to significantly influence those statistics. As it depends on foreign demand, the economic slowdown in Slovak main foreign trade partners, the economic slowdown is also anticipated in Slovakia. The closing of borders has disrupted supply in markets, followed by increased unemployment and reduced economic growth - for example, the area of tourism has been severely affected (Leduc, Liu, 2020; Gorlevskaya, Kubičková, Fodranová, Žák, 2018; Mura, 2019). The sectors most affected are those most targeted by the restrictive measures of national governments. Verification of this claim is, inter alia, a

survey carried out by Eurofound (2020). The number of workers who reported that their working hours were reduced during the restrictive measures is above average (compared to the EU as a whole) in all Mediterranean countries (Cyprus, Greece, Malta, Spain, Italy). In these countries, tourism accounts for a significant share of GDP and total employment. As transport is one of the sectors most affected by the global pandemic, the causality of the slump in tourism is indisputable (De Castro, Vlčková, Hnát, 2017; Fojtikova, Stanickova, 2017; Hnat, Sankot, 2019; Lipkova, Hovorkova, 2018; Grmelova, Sedmidubsky, (2017).

As OECD indicates, global GDP will fall by about 4.5% this year, while in the spring of 2020 the prediction was about 0.9% (according to Morgan Stanley), respectively 1.25% (according to Goldman Sachs). The International Monetary Fund (IMF) and the World Bank (WB) have called on the world's largest G20 economies to temporarily refuse to withdraw loans from the world's poorest countries due to the ongoing pandemic. The impact of coronavirus on the world economy is very serious, but especially low-income countries have been hit by the crisis (Cepel et al., 2020; Kostynets et al., 2020). The tendency of a pandemic to significantly affect poorer regions or countries is also confirmed by the opinions of many other experts. The emerging economies and low-income countries recorded the largest outflow of capital to date. Besides this idea, it is also appropriate to mention the growing economic polarization within the Eurozone area as one of the effects within the Covid-19 pandemic. This impact is estimated to be more severe in the southern Eurozone countries than in the northern ones. According to authors such as Sauer, Hadrabova, Kreuz (2018), Taušer, Arltová, Žamberský (2015) and Drulakova, Zemanova, (2020) the causes of this phenomenon can be found in the period before the outbreak of the Covid-19 issue. The polarization processes between the north and southern Eurozone states have been known for a long time (especially since the debt crisis) and are caused by heterogeneous structural resilience of individual Eurozone member states. In other words, the uneven effects of the pandemic are due to the lower resilience of southern Eurozone due to their more vulnerable economic structure. Korauš, Kaščáková, Felcan (2020), Svarc, Grmelova (2015) and Varadzin (2016) concede that the key parameter of economic production determining the potential for economic growth today is undoubtedly innovation and technology in particular. The economic dominance of northern Eurozone countries such as Germany, Netherlands, Belgium, Finland, etc. is thus justified by another factor - before the crisis, these economies accumulated enough technological capacity to compete successfully on international market. Dano, Lesakova (2018), Sauer, Kolinsky, Prasek (2019) and Zemanova (2020) indicate that technological sophistication is more important than price competitiveness. For these reasons, macroeconomic forecasts point out to a more pronounced rise in unemployment due to the economic downturn in southern European countries such as Greece, Italy, Spain and Portugal. Deeper decline in GDP in these countries will exacerbate existing economic difficulties compared to the richer north (Helisek, 2018; Peracek, Noskova, Mucha, 2017). Miklosik, Kuchta, Evans, Zak (2019) and Petriashvili, Mansoor, Sahatqija, Zaganjori (2019) concur that following deteriorating macroeconomic indicators, like a sharper decline in government revenues, are also expected, that limits these countries' ability to increase governmental spending and stimulate a pandemic-damaged economy. In contrast Daňo, Drábik, Hanuláková (2020), Zagata, Sutherland, Hrabák, Lostak (2020) dispute that governmental spending is rising on a much larger scale in northern Eurozone countries, reflecting the existence of better automatic economic stabilizers compared to the southern states in Eurozone monetary group of European countries (Caruso, 2020). The outbreak of the global Covid-19 pandemic and its consequences are thus becoming not only the cause of emerging economic problems, but also the accelerator of already existing macroeconomic difficulties of many developing countries. The impact of a pandemic is therefore very asymmetric, and the intensity of the impacts is thus cardinally dependent on the economy status before the outbreak of a new type of coronavirus (Křečková, Zadražilová, Řezanková, 2016, Grmelová, 2020).

In terms of the GDP negative development in most countries of the world (and thus also the negative development of its global modification), the area of labor migration cannot be neglected as an important determinant of world economy performance (Mentlík, Helísek, 2018). Boksa, Saroch, Boksova (2020) state that restricting mobility is a fundamental tool to handle the spread of Covid-19, and international labor migration falls into this area. However,

limiting international labor migration does not only affect the global economy - the potential impact on remittances for families, communities and national economies of states can be also outrageous (Abel, Gietel-Basten, 2020; Krnacova, Drabik, 2018). According to Drabik, Zamecnik (2016), Helísek (2019) different countries, at different times, durations and intensities, take restrictive measures to partially curb the movement of people - not only at the international level, but often also within their domestic territorial divisions. Machkova, Sato (2017) and Sadílek, Zadražilová (2016) concede that some states enforce the issue of mobility regulation even more vigorously, allowing only the mobility of workers necessary for the proper functioning of the state (servicing the necessary infrastructure - power plants, waterworks, heating plants, gas, security forces, food, medicine, drugstores, oil production, etc.). The impact of restrictive measures taken in this area can make a significant contribution to the downturn in the world economy - migrants generate around 10% of global GDP (WEF, 2020; Grmelova, 2018b; Saroch, 2015).

3. Research objective and methodology

The fallouts of a global pandemic have also affected Slovak companies. It has been possible to change the organization of work in many organizations due to the advanced implementation of communication technologies. The home-office institute has found wide application in all institutions of the public and business environment (Vasilyeva et al., 2018). The aim of the presented study is to assess the impacts of the Covid-19 pandemic on work organization in companies operating in Slovak Republic and on the employees of these entities. Their evaluation is one of the ways to reveal selected trends in labor market in the way of employing people. Based on current circumstances, the questionnaire method was considered the most suitable means of obtaining information in the subject area, as it allows us to address a relatively large number of respondents in a short period of time, while absolutely eliminating health risks resulting from physical contact with survey participants. In case of our study, it is specifically an e-questionnaire, which was sent to a wide range of potential respondents with an unlimited possibility of further dissemination. The survey was conducted from 30th September 2020 to 14th October 2020 and involved 302 respondents in different age structures. As one of the main criteria of the questionnaire was also the size of the organization in which the respondent works or worked, we defined the company based on the division of the Statistical Office of Slovak Republic as follows:
- small business (up to 49 employees, where we also included micro-enterprises up to 9 employees);
- medium sized companies (50 - 249 employees);
- large enterprises (over 250 employees).

The title of the questionnaire was "Impacts of the COVID-19 pandemic on workers with an emphasis on the home office". The title determines the key areas of the survey, which are the consequences of a pandemic in relation to employees, organizations and work from home (home office) as one of the current expressions within the increasingly massive implementation of modern communication technologies into human work activities. We processed the data obtained from the questionnaire survey by means of statistical methods and the findings are presented in this study.

4. Results and discussion

In the following part of the study, we present the obtained results from the survey conducted in October 2020. The survey was focused on issues related to home office and work productivity. The structure of respondents involved in the survey indicates an almost balanced representation of employees in all size categories of enterprises - 34.4% (104 people) work in small companies, 35.8% (108 people) in medium companies and 29.8% (90 respondents) in large companies. Of the eight Slovak regions, only Košice is absent, the Trenčín region was the most represented in percentage terms (55% of respondents), followed by the Žilina region (21.9% of

respondents). The share of other regions individually did not exceed 9%. The input data also show that about 60% of the survey participants were women. The age structure of respondents is shown in Figure 2.
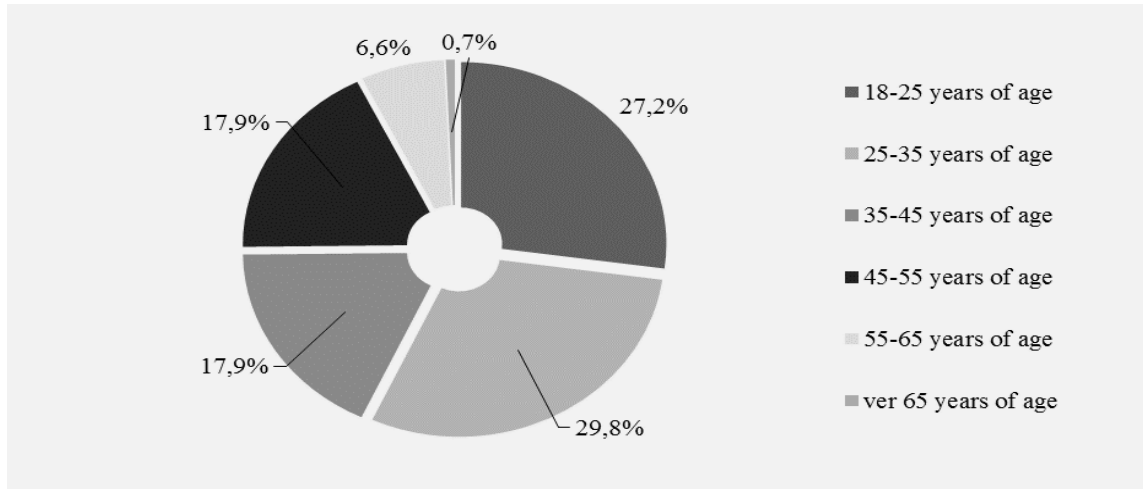
Figure 2. Survey respondents' age structure (in %)

Source: own processing

The GDP level of a state and thus its overall economic performance is cardinally dependent on the private sector properly functioning. It is precisely entrepreneurs and companies that form the backbone of a national economy and determine its current and future potential. That´s why the respondents were asked the following question: " To what extend the company you work in has been economically affected by the Covid-19 pandemic?". In total, 80.8% of respondents described their company as affected by a pandemic; however, in a partial breakdown 28.5% as "significantly affected" and 52.3% as "marginally affected". Only 12.6% of respondents consider the organization in which they work to be "unaffected", the rest described the option "I do not know / do not want to answer" (6.6%). The filtered results of the survey question provided significant data.

We tried to evaluate the obtained data without the representation of Trenčín Region (TSK). In this variation of the questionnaire, a total of 82.4% of respondents described their company as affected, namely 20.6% as "significantly affected" and 61.8% as "marginally affected". In contrast, respondents from Trenčín Region, who were the largest group in the survey, described the organization in which they work as "significantly affected" in almost 35% cases, 44.6% of survey participants from this region chose the "marginally affected" option. The measured data in terms of several parameters are shown in Table 1.

Table 1. Percentage of answers to the question: "To what extend the company you work in has been economically affected by the covid-19 pandemic?"

applied filter	answer options			
	severely affected	*marginally affected*	*no affected*	*I can't judge / I don't want to answer*
the whole SR	28,5	52,3	12,6	6,6
SR except Trenčín region	20,6	61,8	7,4	10,3
Trenčín region	34,9	44,6	16,9	3,6
small businesses	28,8	50	17,3	3,8
medium-sized enterprises	22,2	59,3	7,4	11,1
large companies	35,6	46,7	13,3	4,4
Women	28,9	54,4	8,9	7,8
Men	27,9	49,2	18	4,9
18-25 years of age	28,9	54,4	8,9	7,8
25-35 r years of age	26,7	55,6	13,3	4,4
35-45 years of age	29,6	55,6	0	14,8
45-55 years of age	33,3	44,4	14,8	7,4
55-65 years of age	40	50	10	0

Source: own processing

It follows from the obtained data that the number of respondents in Trenčín Region who described their company as "unaffected" by the pandemic outbreak is more than a quarter higher compared to the results from the entire Slovak Republic. If we compare this number with the results of Slovak Republic without TSK, the number is even higher by more than a half. However, analogous results also appear from the opposite side of the imaginary scale - almost 35% of respondents from TSK consider their company to be "significantly affected", which is a one fifth more than 28.5% of respondents in whole Slovakia. When comparing the Trenčín region with the results from Slovak Republic without TSK, the difference is even higher, over 40%. Only 44.6% of respondents from Trenčín Region chose the "marginally affected" option, which is the smallest share in the inter-regional comparison. This suggests that Trenčín Region is economically very diverse and the impacts on local companies are in line with this fact. The number of companies in TSK was hardly affected by the covid-19 pandemic issue (and the restrictive measures associated with it), but on the other hand there is the highest share of unaffected companies and organizations (within the inter-regional comparison).

Besides regional differences in answers to question, the different answers depending on the gender of a respondent are also evident. While for the "significantly affected" and "marginally affected" options, the percentages are relatively evenly represented; for the "not affected" answer there is an obvious difference (Table 1). Women, compared to men, have described their company as unaffected twice less, and this fact can be determined by several reasons. Firstly, women are generally more likely to work in positions that are currently most affected by the pandemic (sectors such as healthcare, social care, education, trade and services, tourism, etc.), and they have to face much more work pressure. In addition, they often have to pay increased attention to childcare and household, as many school and pre-school facilities remain closed or operate on a restricted basis. The third reason has existed for a long time, but the pandemic situation highlights it dramatically - it is the gender inequality. As a result of a pandemic, bigger significant drop in women's employment is expected, as well as a deeper gender pay gap - even before the pandemic, it was on average at 16%.
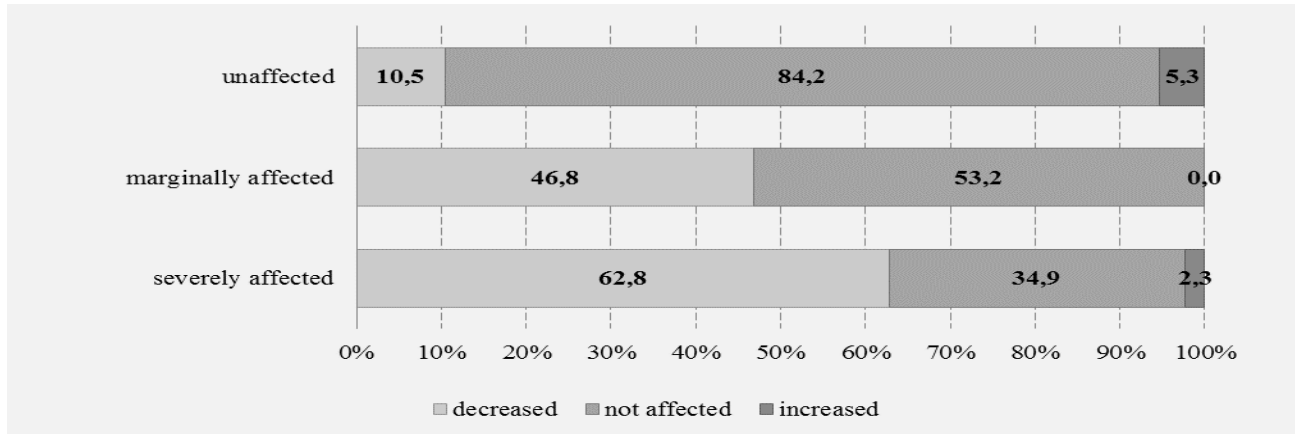
Figure 3. Relationship between respondents' answers to questions regarding the degree to what extent their organization was affected by a pandemic and the changes in their salary as a result of a pandemic.
Source: own processing

The Figure 3 indicates that there is a direct relationship between the intensity for economic disability perception in organization and the development of workers' incomes during the pandemic situation. Answers to the questions in questionnaire "To what extent the company you are working has been economically affected by the Covid-19 pandemic?" and "How did the Covid-19 pandemic outbreak affect your income?" confirm this assumption. It can be implied that respondents´ responses describing their organization as "severely affected" had the highest proportion (compared to other options) of those who lost income as a result of the pandemic (almost two-thirds of respondents identified the "decreased" option). At the same time, the share of responses "not affected by" was the lowest - only a little more than a third of participants in the survey stated that their income stagnated (34.9%). With a lower degree of economic impact on a company, expressed by the option "marginally affected", the number of respondents who confirmed a decrease in their income also decreased (46.8%). The proportion of those whose income did not change ("not affected") jumped to more than half of all responses. Compared to the previous data, the situation was most marked in the answers of the respondents who described their organization as "unaffected". Here, the share of those who reported a reduction in their income reached only 10.5% (almost six times less than in the answer "significantly affected"). In contrast, even 84.2% of respondents stated that their income was the same as in the period before the pandemic outbreak, which is the highest value measured in this respond. As in the whole set of respondents (more than 300) there were only 1.3% of replies indicating that the income of a respondent increased due to the pandemic (the option "increased"), we present these data just for information and do not consider it relevant to deduce from them any assumptions and dependencies with other survey parameters. At the same time, we also omit the answers to the option "I can't judge / I don't want to answer", as their essence automatically excludes the possibility of comparison with other questions of the survey.

Table 2. Percentage of answers to the question "How did the Covid-19 pandemic outbreak affect your income?"

applied filter	answer options		
	decreased	*not affected*	*increased*
the whole SR	47,7	51,0	1,3
small businesses	50,0	48,1	1,9
medium-sized enterprises	50,0	48,1	1,9
large companies	42,2	57,8	0
18-35 years of age	44,2	53,5	2,3
35-55 years of age	55,6	44,4	0
over 55 years of age	36,4	63,6	0

Source: own processing

The overall results of the answers to the question concerning the changes in the respondents' income and their variations are presented in Table 2. The proportions of the answers "decreased" and "not affected" were relatively similar not only in the overall assessment (the whole SR), but also in different applied filters - the survey results show that they were almost identical within the interregional comparison; small differences indicate results regarding the company size (only employees from large companies report a reduction in their income less often than those working in small and medium-sized enterprises). There is also no indication of existing causality between the genders of respondents and their income developmency. However, the development of income is clearly influenced by the age structure of workers. We found out that younger survey respondents (categories 18-25 and 25-35 years) reported a decrease in their income on average in 44.2% of cases, while the category 35-55 years (combined categories 35-45 and 45-55 years)) up to 55.6%, which is already a statistically significant difference. However, a group of respondents over the age of 55 reported a reduction in their income in only 36.4% of cases - at least within the entire filter of answers. It can be assumed that until a certain age of an employee, the risk of a decrease in income due to the Covid-19 pandemic can rise gradually, while after reaching a peak, this trend generally acquires the opposite tendency and gradually falls down. However, the explanation of this phenomenon requires a larger volume of data and their deeper analysis, so that issue can be the object for the next study.
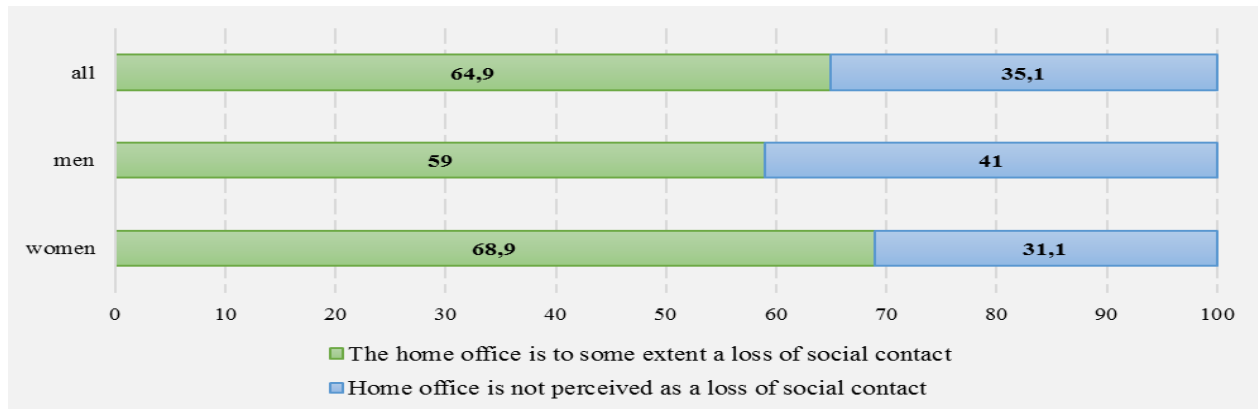
Figure 4. Respondents' answers to the "home office" question: "Which of the following statements do you agree with?" In percentage terms
Source: own processing

Another interesting aspect of the survey are the differences in the answers of men and women to the question - whether they consider work from home to be a loss of social contact or not (Figure 4). While almost 7 out of 10 female respondents chose the yes option, in case of men it was 59%. It has been revealed that women perceive the negatives associated with social isolation during the home office, to a greater extent than men (by about 15%). It can be noticed that answers to this question differed only minimally in terms of age structure. Based on that it can be concluded that attitudes to this question are determined by factors other than the age of a respondent. These and previous information thus confirm the data obtained from our survey - women perceive the situation regarding the pandemic more negatively than men.

In addition, there are also differences in answers when it comes to the survey participants´ age structure (Table 1). While young people at the age of 18 - 25 consider the society in which they work to be "severely affected" in 28.9% of cases, the category of respondents at the age of 55 - 65 states this option in 40% of cases. There are several reasons why older people evaluate the state of their company more negatively than the younger population. There could be objective reasons - for example, a higher concentration of older employees in companies and organizations that operate for a long time and, unlike modern companies, have not yet required significantly more advanced technical knowledge and skills from their employees. This is now the reason for the risk of economic difficulties, respectively, their demise (due to unpreparedness and inability to reflect on current trends related to the use of communication technologies and other tools enabling, for example, home offices). Workers at this age, currently called as Generation X, they often keep one job during their live in the same company, so they perceive any threat to their job more negatively - their adaptability in this direction is naturally limited compared to the younger generations. Another explanation for the more negative view of the situation in companies in case of senior survey respondents may also be the health context of the pandemic - usually older people are directly proportional to the higher risk of health problems, resulting in natural concern for their health. Last but not least, it is probably the life experiences from more economically difficult periods (transition from a centrally planned economy to a market economy, the years of privatization in 90´s, the global financial crisis in 2008) that mostly negatively affect the expectations and assumptions of older people in connection with current events around the pandemic.
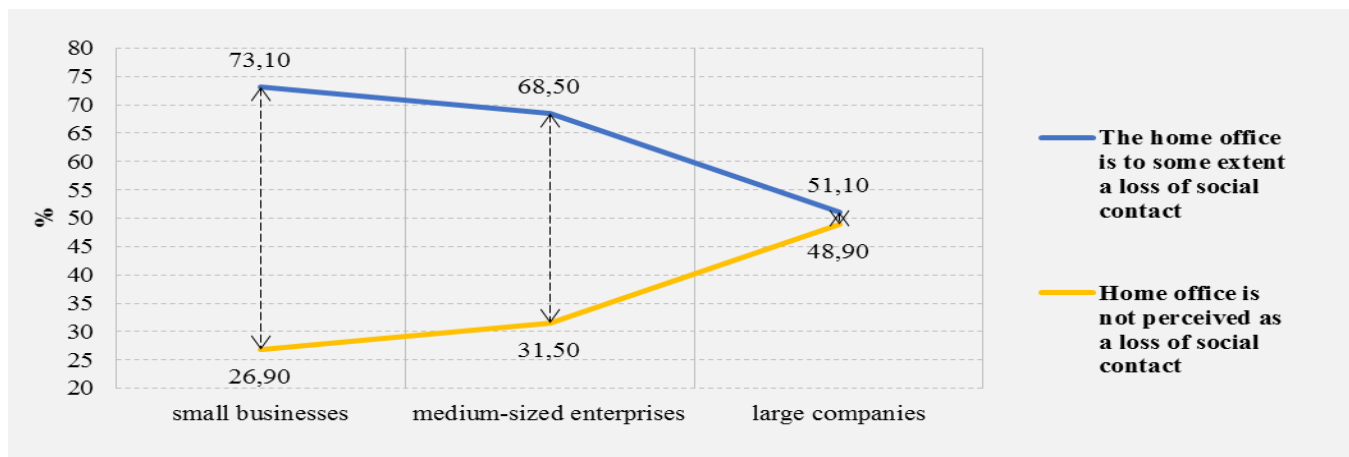
Figure 5. Respondents' answers to the question "Which of the following statements are you identified with?" highlighting the size of organization you work in (%)

Source: own processing

In the next decomposition of survey results, a causality between the size of the company (organization) and the perception of social aspect of home office has been observed (Figure 5). It has been noticed that while respondents working in small businesses (up to 49 employees) perceived work from home as a loss of social contact in almost three quarters of cases (73.1%), with the growing number of employees in the company this share had a declining trend - in medium-sized enterprises (from 50 to 249 employees) was this issue at 68.5% and in large companies (over 250 employees) it even decreased to the value of 51.1% of respondents. Based on two answer alternatives to the question, the second answer had a logically opposite tendency - its share grew with a larger size category of the organization (company). In large companies, 48.9% of respondents did not perceive the home office as a loss of social contact, in medium-sized 31.5%; in contrast, in small organizations only 26.9% of respondents chose this option. Based on these findings, it can be assumed that there is a causal relationship between these two variables - the size of the company affects people's attitudes in terms of the home office issue. The explanation for this relationship is relatively well logically justified - small companies often operate as a larger "family" - employees know each other and there are often more personal relationships existing between subordinates and superiors. However, the higher the number of people working in organization, the lower appearance of personal contacts among people across the company. In large companies, where hundreds to thousands of employees often work at the same time, such relationships are a complete abstraction. Thus, it is reasonable to expect that due to the unfavorable epidemiological situation the employees of small companies and enterprises perceive assigned work from home more negatively than people employed in large organizations, usually operating in a much more formal and less personal regime.

Conclusions

Considering the research results, it can be concluded that while the exponentially growing significance of communication technologies and artificial intelligence across the sectors of national economies has been already assessed many times within the context of Industry 4.0, the current Covid-19 pandemic and its consequences is still a new and unexplored issue. Nevertheless, there is a close link between the two seemingly incompatible entities. The whole situation regarding the spread of Covid-19 can be seen as a kind of accelerator to implement the ideas of intelligent industry concept into economic production. Even though the effects of the first wave of the pandemic in Slovakia and in other countries are already known in clearer outlines, the overall and longer-term consequences can only be estimated so far. Either way it can be predicted that a Covid-19 pandemic will be a part of people's lives for longer than initially expected. In order to learn to coexist with a pandemic, we must understand its impact on human lives and try to adapt to new conditions - in every aspect of how the society and economy work.

The research study has revealed that the Covid-19 pandemic has a severe impact on economic life in a society and healthcare systems. The most exact evidence of this statement is the extraordinary fluctuations of main macroeconomic indicators, which have seemed stable for a relatively long time. National economies have been forced to cope with unprecedented constraints, which often persist to this day. To summarize the results of the research, the year-on-year decline in GDP by tens of percent was recorded in several countries, such as the USA, China and Japan from the G20. Here, however, it is necessary to realize that the macroeconomic results of each country are determined by its internal economic development. In particular, the private sector such as firms and companies represent the performance of any economy. For this reason, we conducted a survey focused on private sector in Slovakia in particular - the respondents were employees who provided unique information about the situation in which companies are operating. A synergetic result of the survey is also the assessment of the ordinary worker's view on the implementation of existing trends (e.g. home office) depending on gender, age, region workplace and the size of an organization. The main uniqueness is that the survey results would serve as a tool for a better understanding of the multidimensional impacts of the Covid-19 pandemic. At the same time,

they make it possible to reveal some trends in behavior of different groups of workers and to work with these trends in such a way that the economic impact on companies is to be minimized in the future.

To broaden the topic, the further research will continue with exploring the role of Industry 4.0 and its impact on labor market development within the world economy, particularly in the U.S. and EU economies. Regarding the Covid-19 global pandemic outbreak issue within the Industry 4.0 the smart quarantine is to be a crucial issue. That's why our next research will also deal with the implementing of smart quarantine in Slovakia. As research limitation it can be mentioned that some questioners from the survey had to be void and some answers were not relevant. The set of companies, which were the subject of the research, is a limiting factor. The selection of companies based on their regional operation, size and business sector does not correspond to the structure of companies in all Slovakia. Slovakia´s industry structure is specific for its automotive focus, having the greatest number of cars produced per capita in Europe. Therefore, the responses of large companies in the sample reflect the automotive industry.

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Adriana GRENČÍKOVÁ, doc., Ing., PhD. Is the Associate professor at the Department of Personnel management and Human resources management, Faculty of Social and Economic Relations at Alexander Dubcek University of Trencin, Slovakia. Her scientific interests: human resource management, labour market.
ORCID ID: 0000-0003-1077-1127

Valentinas NAVICKAS, Prof., Dr. is the Professor at Faculty of Social and Economic Relations at Alexander Dubcek University of Trencin, Slovakia. Author of more than 350 scientific publications (including monographs published in the Czech Republic 2013 and Slovak Republic 2016, 2018) and scientific articles. Prepared 7 doctors of social (economics) science; now he is a research adviser of 2 persons maintaining a doctor's thesis. Fields of scientific interest: international economics, clusterization, competitiveness.
ORCID ID: 0000-0002-7210-4410

Marcel KORDOŠ, **Ing., PhD. i**s the Assistant professor at the Department of Public Administration and Regional Economy, Faculty of Social and Economic Relations at Alexander Dubcek University of Trencin, Slovakia; the author of more than 100 scientific papers and publications published domestically and abroad. Fields of scientific interest: international economics, integration processes in EU.
ORCID ID: 0000-0002-1833-7096

Matej HÚŽEVKA, Ing. is the PhD. Student at the Department of Personnel management and Human resources management, Faculty of Social and Economic Relations at Alexander Dubcek University of Trencin, Slovakia. Fields of scientific interest: human resources management, international economics.
ORCID ID: 0000-0003-0137-4656

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SIMPLE ADDITIVE WEIGHTING VERSUS TECHNIQUE FOR ORDER PREFERENCE BY SIMILARITY TO AN IDEAL SOLUTION: WHICH METHOD IS BETTER SUITED FOR ASSESSING THE SUSTAINABILITY OF A REAL ESTATE PROJECT

Nomeda Dobrovolskienė [1], Anastasija Pozniak [2]

[1,2] *Vilnius Gediminas Technical University, Saulėtekio al. 11, LT-10223 Vilnius, Lithuania*

E-mails:[1]nomeda.dobrovolskiene@gmail.com; [2]anastasija.pozniak@vilntech.lt

Abstract. In the real estate sector, sustainability assessment tools enable the transition to buildings with lower impacts on the environment, the economy and the society. A variety of multi-criteria decision-making (MCDM) methods has been proposed to address this problem. There is, however, no consensus on the method to be used in each assessment case. The paper presents an empirical application and comparison of two different MCDM approaches SAW (Simple Additive Weighting) and TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution) to assessing the sustainability of a real estate project. 18 sustainability criteria weighted by experts formed the basis of sustainability assessment of a real estate project. The results of the study revealed a significant difference between the ranks obtained by SAW and TOPSIS. Moreover, the results of the MCDM sensitivity analysis showed that the TOPSIS method is more sensitive to changes in baseline data than the SAW method.

1. Introduction

More than 30 years after the 1987 Brundtland Commission report, sustainability and its assessment have gained global recognition. Brundtland and subsequent reports (ICLEI 1994) promoted a holistic approach to sustainable development, taking into consideration economic, environmental and social effects. However, a review of the recent scientific literature shows a growing tendency to extend the concept of sustainability beyond three main dimensions (Vogt and Weber 2019; Purvis et al. 2019; Danish and Senjyu 2020; Venturini et al. 2020). This is reflected by increasing attention to the technological dimension, which plays an important role in developing new technologies that can minimize the impact on climate change and positively contribute to clean energy generation and consumption (Nowotny et al. 2018; Bulbul et al. 2018). All of this is of great relevance for the real estate

sector, as it is responsible for approximately 40% of energy consumption and 36% of CO2 emissions in the European Union. In this paper, therefore, in order to assess the sustainability of a real estate project, the authors expand the concept of sustainability with the technological aspect.

Sustainability assessment is defined as a process by which decision-making is geared towards sustainability (Bond and Morrison-Saunders 2011, Zimek and Baumgartner 2019). Most authors agree that sustainability assessment is a multidimensional problem (Tupėnaitė et al. 2018). Therefore, sustainability-focused systems and assessment methods are developed (Dobrovolskienė 2016, Tupėnaitė et al. 2018). Among all certification systems and methods of sustainable building evaluation, the most popular ones are DGNB (German Sustainable Building Council), LEED (Leadership in Energy and Environment Design), and BREEAM (Building Research Establishment Environmental Assessment Method) (Li et al. 2017). These methods are based on a defined set of criteria, which are rated according to the criteria importance factor. These methods, however, are often criticized for ignoring economic and social concerns. Furthermore, some of these methods do not prioritize sustainability criteria with a view to facilitating decision-making (Drėjeris and Kavolynas 2014; Tupėnaitė et al. 2018). The literature analysis also shows that sustainability indicators are effectively used to assess sustainability in the decision-making process (Dahl 2012; Pinter et al. 2012; Singh et al. 2012; Waas et al. 2014; Pereira 2015; Dobrovolskienė and Tamošiūnienė 2016). A wide variety of sustainability indicators have been developed for different stakeholders and applied in different contexts worldwide, using a broad range of methodologies (Dahl 2012; Pinter et al. 2012; Singh et al. 2012; Waas et al. 2014; Oliveira et al. 2016; Dobrovolskienė 2016; Ruiz et al. 2018; Kaklauskas et al. 2018; Chen et al. 2019; Dobrovolskienė et al. 2019; Bithas 2020; Lütje and Wohlgemuth 2020; Mohanty et al. 2020; Reid and Rout 2020; Binder et al. 2020; Carvalho et al. 2020). Thipparat and Thaseepetch (2013) presented a sustainability index, which was computed using VIKOR (in Serbian: Visekriterijumsko Kompromisino Rangiranje). This index is used to assess a sustainable research project. Dobrovolskienė and Tamošiūnienė (2016) proposed to measure the sustainability of a construction project by a composite index, which was developed using the SAW method. The index is composed of 15 sustainability criteria (four economic, five social and six environmental), which were rated as most important by construction practitioners. Arbolino et al. (2018) used the SAW method and the Principal Component Analysis model for designing the Industrial Environmental Sustainability Index. Krajnc and Glavic (2005) presented a model for constructing a composite sustainable development index that outlines company performance with regard to all three dimensions of sustainability, using analytic hierarchy process (AHP) to obtain the weights of the indicators. The sustainability sub-indices are then aggregated into the composite sustainable development index using the weighted average. Wang et al. (2012) proposed a novel method for developing a mixed model, which enables a comprehensive and objective integration of numerous criteria into a composite indicator using TOPSIS. Escrig-Olmedo et al. (2017) adopted fuzzy TOPSIS to assess environmental, social and governance performance of companies. Firstly, synthetic indicators for each area of corporate sustainability have been elaborated and, secondly, investor preferences relating to environmental, social, governance and financial areas have been integrated to design a unique investment decision solution. Dobrovolskienė et al. (2019) designed a composite sustainability index for real estate projects, made up of 21 sustainability criteria (five economic equality, eleven environmental protection, and five equity indicators). The index was developed using the SAW method. Therefore, the use of MCDM methods is appropriate in the context of sustainability assessment, given their ability to aggregate numerous sustainability indicators into a single score (Tupėnaitė et al. 2018, El Gibari et al. 2019).

The aim of this article is to determine which MCDM method is better suited to assess the sustainability of a real estate project. These methods are (1) SAW (Simple additive weighting), and (2) TOPSIS (Technique for order preference by similarity to an ideal solution).

The article is structured in sections. Section 2 gives an overview of MCDM methods, together with sensitivity analysis on MCDM methods. In Section 3, a real estate sustainability index is constructed by means of two

MCDM methods, and sensitivity analysis on these methods is carried out. The paper is finished with a number of conclusions in Section 4.

2. Research methodology

This section gives an overview of multi-criteria decision-making methods, a focus on the two MCDM methods adopted in this study (namely, TOPSIS and SAW). Moreover, this section also describes sensitivity analysis.

2.1. Overview of multi-criteria decision-making methods

Decision-making processes based on multiple criteria are commonly referred to as MCDM. Given their multidisciplinary nature, MCDM methods provide decision-makers with useful tools in the decision-making process (Taşabat and Özkan 2020). The choice of a multi-criteria decision-making method must take account of such issues as problem complexity, uncertainty rate, data type, and decision-maker preferences (Sabaei et al. 2015; Pasha et al.2020).

MCDM methods fall into two major groups (Zavadskas et al. 2014; Mardani et al. 2015; Dobrovolskienė et al. 2019; Jamei R. 2020):
- Multi-Objective Decision-Making (MODM) methods: An optimization problem is solved with an objective function while evaluating certain constraints.
- Multiple-Attribute Decision-Making (MADM) methods: Decision-making is intended for discrete comparison of alternatives.

MADM methods address problems with a discrete set of possible alternatives $(A = A_1, A_2, ..., A_i, ..., A_m)$. Alternatives mean possible different and targeted decisions specified by certain indicators $(X = X_1, X_2, ..., X_j, ..., X_n)$. These indicators reflect certain attributes of the alternatives, each of them describing one attribute of an alternative (Turskis et al. 2009; Liou and Tzeng 2012; Zavadskas et al. 2014; Yin and Shyur 2019).

MADM consists of the following steps (Turskis et al. 2009, Dobrovolskienė 2016): (1) development and selection of objective-related alternatives; (2) selection and analysis of criteria specifying the alternatives and rejection of related indicators; (3) selection of the key criteria and elimination of non-essential criteria; (4) determination of weights (significance) for each criterion; (5) aggregation of the criteria describing the alternatives; (6) selection of values of the criteria; (7) assessment the alternatives on the basis of the aggregate values of the criteria by applying a multi-objective function; (8) application of adopting a normative analysis method; (9) selection of the most acceptable alternative; and (10) where none of the alternatives are acceptable, other alternatives are sought, data collected, and the assessment cycle repeated for other alternatives, collecting data, and repeating the assessment cycle.

Such problems are usually solved in a matrix form. First, a problem-solving matrix is constructed with as many rows as the number of alternatives and as many columns as the number of criteria. The decision matrix is normalized so that numerical values of criteria have no measurement units. Then, the normalized decision matrix is assessed, i.e., the value of each criterion is multiplied by the significance of the corresponding criterion. The sum of the weights of the criteria must be equal to one (Dobrovolskienė 2016).

Based on the type of initial data used for the ranking of alternatives, MADM methods are divided into deterministic, stochastic and fuzzy set theory methods. MADM methods can also be classified on the basis of the number of decision-makers involved in decision-making. Taking into account the number of decision-makers,

these include individual and group decisions (Simanavičienė 2011). Moreover, MADM methods are also classified according to information about indicators provided by the decision-maker (Zavadskas and Turskis 2011, Simanavičienė 2011, Dobrovolskienė 2016).

A wide range of MADM methods is currently used: GM (Geometric Mean), SR (Sum of Ranks), AHP (Analytic Hierarchy Process), SAW (Simple Additive Weighting), TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution), VIKOR (in Serbian: Visekriterijumsko Kompromisino Rangiranje), COPRAS (Complex Proportional Assessment), ELECTRE (Elimination and Choice Expressing Reality), PROMTHEE (Preference Ranking Organization Method for Enrichment Evaluation) and others (Podvezko 2011; Ferreira et al. 2016; Dobrovolskienė 2016; Serrai et al. 2017; Mousavi-Nasab and Sotoudeh-Anvari, 2017; Yin and Shyur 2019; Broniewicz and Ogrodnik 2020; Pasha et al. 2020; Tavana et al.2020; Meshram et al. 2020; Jiang 2020; Sarband et al. 2020; Zhang et al. 2020). Each method has its own benefits and limitations, and there is no agreement yet as to which method is best suited for solving a problem of a certain type (Dobrovolskienė 2016; Ferreira and Santos 2016; de Farias Aires and Ferreira 2019). However, as the literature analysis showed, among all MADM methods, the most popular ones are SAW and TOPSIS (Podvezko 2011; de Farias Aires and Ferreira 2019; Dobrovolskienė et al.2019; Broniewicz and Ogrodnik 2020)

2.1.1. Simple Additive Weighting

Simple Additive Weighting is probably the best known and most widely used MADM method (Anupama et al. 2015; Mukhametzyanov and Pamucar 2018; Jamei R. 2020; Yasmin et al. 2020). The SAW method is also known as a scoring method. The basic logic of the SAW method is to obtain a weighted sum of performance ratings of each alternative over all attributes. An evaluation score is calculated for each alternative by multiplying the scaled value given to the alternative of that attribute with the weights of relative importance directly assigned by the decision maker followed by summing up of the products for all criteria (Mukhametzyanov and Pamucar 2018; Mukhlis et al. 2019; Putra et al. 2020).

When the SAW method is used to find the best alternative, normalization of variables is required according to the following formula so that the variables can be compared (Ibrahim and Surya 2019):

$$n_{ij} = \frac{r_{ij}}{\max(r_{ij})}, \tag{1}$$

where:
r_{ij} – the value of j alternative i variable;
$\max(r_{ij})$ – the highest value of i variable.

However, as this method allows comparing only those variables that are maximizing, minimizing variables can be also transformed into the maximizing ones according to the formula (Dobrovolskienė 2016):

$$n_{ij} = \frac{\min(r_{ij})}{r_{ij}}, \tag{2}$$

where:
$\min(r_{ij})$ – the lowest value of i variable.

In the final stage, the sum S_j of the weighted normalized values of all indicators is calculated for every jth object according to the formula:

$$S_j = \sum_{i=1}^{m} \omega_i n_{ij},$$

(3)

where:
ω_i – the weight of i variable;
n_{ij} – the normalized value of i variable for j object.
S_j falls between 0 and 1.

After the application of these formulas for normalization of variables and its summation, the decision regarding the best alternative, containing the highest result (highest level of project sustainability) is selected.

2.1.2. Technique for Order Preference by Similarity to an Ideal Solution

The TOPSIS method is one of useful prioritization methods (Jamei R. 2020, Rathi et al. 2020). It was first proposed by Hwang and Yoon (1981) and further developed by Yoon (1987). Under this method, the best alternative has the shortest distance from the positive ideal solution (PIS) and the farthest from the negative ideal solution (NIS) (de Farias Aires and Ferreira 2019; Štirbanović et al. 2019; Rana and Patel 2020). TOPSIS method has a number of advantages such as (Mohd Khairuddin et al. 2015; Rana and Patel 2020): (1) ability to identify the best alternative fast; (2) simple, rational and comprehensive concept, rationality and comprehensibility; and (3) simple computational process that can be easily programmed into a spreadsheet. The TOPSIS method comprises the following steps (Satpathy et al. 2016):

The first step under the TOPSIS method is data normalization according to the following formula (Vafaei et al. 2018):

$$n_{ij} = \frac{r_{ij}}{\sqrt{\sum_{j=1}^{n} r_{ij}^2}}$$

(4)

The next step is multiplying the weight of each criterion by the normalized performance values according to the formula (Vafaei et al. 2018):

$$W_{ij} = \omega_{ij} n_{ij},$$

(5)

where:
ω_{ij} – the weight of i alternative.

The following step of the process involves determination of the positive ideal (A^+) and the negative ideal solution (A^-) (Vafaei et al. 2018):

$$A^+ = \{W_1^+, \ldots, W_n^+\} = \left\{\left(\text{Max } W_{ij} \mid j \in J\right), \left(\text{Min } W_{ij} \mid j \in J'\right)\right\}, \tag{6}$$

$$A^- = \{W_1^-, \ldots, W_n^-\} = \left\{\left(\text{Min } W_{ij} \mid j \in J\right), \left(\text{Max } W_{ij} \mid j \in J'\right)\right\}, \tag{7}$$

where:

J – positive factors or criteria (maximizing);

J' – negative factors or criteria (minimizing).

Then, the TOPSIS method requires calculating the separation of each alternative from the positive ideal solution (D_i^+) and the negative ideal solution (D_i^-) (Vafaei et al. 2018):

$$D_i^+ = \sqrt{\sum_{j=1}^{n} \left(W_{ij} - W_j^+\right)^2} \tag{8}$$

$$D_i^- = \sqrt{\sum_{j=1}^{n} \left(W_{ij} - W_j^-\right)^2} \tag{9}$$

The final step of the TOPSIS procedure is finding the performance score, i.e., the relative closeness to the ideal solution according to the following formula (Vafaei et al. 2018):

$$C_i^* = \frac{D_i^-}{D_i^+ + D_i^-}, \tag{10}$$

Where C_i^* value falls between 0 and 1, with higher values indicating better alternatives.

Hence, after computing these steps, the ranks of the preference order of alternatives can be determined and the alternative with the highest value, i.e., having the shortest distance from the ideal solution (highest level of project sustainability), is selected.

2.2. **Sensitivity analysis of MCDM methods**

Multi-criteria challenges solved by applying MCDM methods are usually based on subjective opinions of professional experts in the domain concerned. The results may therefore be biased and easily changed when minimal modifications are applied to criteria or the significance of criteria. Ultimately, the step of sensitivity analysis of MCDM methods is crucial in order to determine whether the result would change if the initial values of variables were altered (Simanavičienė and Ustinovičius 2011). The results obtained from sensitivity analysis are then compared with the initial results. This step is very important as it communicates the result, provides insights as to how the method behaves and its response to changes in the input variables (Borgonovo and Plischke 2016). Given the distributions of the values of criteria, a more sensitive or less sensitive method could be chosen in order to determine the rationality of the decision (Simanavičienė and Ustinovičius 2011). Therefore, it is necessary to determine and evaluate the sensitivity and reliability of MCDM methods.

In literature, sensitivity analysis is depicted in two main ways:
1.   When the sensitivity of a MCDM method is evaluated based on parameters and weights of criteria;
2.   When the sensitivity of a MCDM method is evaluated based on deviations from initial values.

The main idea behind sensitivity analysis of MCDM methods is to identify factors contributing to the uncertainty of model results. Sensitivity analysis allows determining which parameters of a model are important and more accurate and thus would allow significantly reducing the uncertainty of model results and which parameters do not require any further refinement as they have little impact on the outcome (Simanavičienė and Ustinovičius 2011).

It should be noted that, according to the study performed by Simanavičienė and Ustinovičius (2011), the error of the initial variables by ± 5% is significant for the ranking of alternatives. Hence, one of the easiest ways to obtain a reliable MCDM outcome is to take into account possible errors in the initial values. This way, sensitivity analysis is performed based on the project's rank disposition when input variable x_{ij}% changes by ± λ% (λ = ± 1%; ± 2%; ± 3%; ± 4%; ± 5%;). That is, by applying MCDM methods and having the initial results of indices, alternatives are ranked in such a way that the highest result of an index corresponds to rank number 1, while the project with the lowest index result corresponds to rank number 3. Hence, variables of alternatives within MCDM methods are changed by ± λ% and the results are calculated once again by MCDM methods following the same procedure. When results are obtained, ranks are assigned again to each level of percentage change in order to show which MCDM method is more sensitive and at which percentage change the rank of alternatives will change. This is needed in order to understand the minimum modification of weights that is required to change the ranking (Operational 1995). Consequently, the method under which ranking of projects changes with the change in variables by ± λ% is considered to be sensitive. However, the reliability of results is assessed by determining the most common rank of alternatives as it shows the reliability of the initial rank (Simanavičienė and Ustinovičius 2011). The studies performed by Zavadskas et al. (2007) showed that changes in certain criteria under the SAW method do not affect the final results of the solution, that is, this method is not sensitive to changes in parameters. The results also showed that the TOPSIS method is more sensitive compared to the SAW method with regard to changes in initial criteria (Zavadskas et al. 2007).

According to Mulliner et al. (2016), the ranking results of MCDM methods depend on the criteria that are considered within the analysis. As criteria and their ranking are usually based on the subjective opinion of experts, these rankings can vary moderately; therefore, the results and possible biases should be evaluated. Taking into consideration the subjective selection of criteria and assignment of weights, sensitivity analysis can be performed on the basis of the level of quantification of crosstalk between criteria and the ranking, which in turn indicates how the ranking of alternatives is going to change when the weights of criteria change (Mulliner et al. 2016). This is followed by the investigation of the most significant criterion in the analysis which is denoted to be the one that changes the ranking of alternatives with the smallest relative change in its weight. The study performed by Mulliner et al. (2016) showed that with the change in the level of weights by ± 50% the TOPSIS method outperforms other MCDM methods.

Also, as claimed by Simanavičienė and Ustinovičius (2011), sensitivity analysis can be performed taking into consideration only one parameter while all other parameters are fixed. It is usually performed when the correlation between variables and parameters is ignored and not analyzed. By default, the most sensitive criterion is the one whose weight or significance is the highest. Also, the most critical criterion can be determined. As already mentioned, this is the criterion that requires only a minimal change in its value significance in order to change the ranking of alternatives. Therefore, by applying the method of only one parameter or variable consideration, the decision-maker is able to consider one parameter at a time by applying minimal changes to the significance values of criteria.

Moreover, sensitivity analysis can be performed by applying Monte Carlo modelling. Monte Carlo method is based on statistical modelling and is applied when it is not possible to obtain accurate results using a deterministic algorithm (Simanavičienė and Ustinovičius 2011). For this case, variables are usually generated on the basis from uniform distribution $X \sim U(a,b)$ and normal distribution $X \sim N(\mu,\sigma)$. A uniform distribution is used by the authors to generate significance values for random indicators. Also, a decision matrix is formed using the values of criteria for alternatives. Consequently, using the significance values of the indicators provided by the experts, the rationality of alternatives is assessed by taking the generated matrices using the MCDM methods. Once the most common rank of an alternative has been determined, the frequency of the occurrence of that rank value is calculated (Simanavičienė and Ustinovičius 2011). This way, the reliability of results is evaluated. The studies performed by Simanavičienė and Ustinovičius (2011) showed that if the possible error rate is not less than ± 5%, the ranking of alternatives changes with regard to both distribution laws. Moreover, in their study, the TOPSIS method was more sensitive compared to the SAW method with regard to both distributions.

In the light of the above, the weights of criteria are usually set subjectively with some biases and possible errors in setting values are not taken into account, which may cast doubts on the reliability of the decision outcome. Therefore, sensitivity analysis of MCDM methods is important for making decisions, for identifying the main criterion that affects the final ranking of alternatives and for determining the decision stability and risk. It appears from the scientific literature (Wolters and Mareschal 1995; Zavadskas et al. 2007; Simanavičienė and Ustinovičius 2011; Mulliner et al. 2016) that sensitivity analysis is usually performed on the basis of the significance of criteria but it is also recommended to conduct sensitivity analysis on the basis of the values of criteria.

3. Comparison of SAW and TOPSIS methods

This section presents a real estate sustainability index (RESI), which was constructed using SAW and TOPSIS methods. The index was compiled using the following algorithm (Fig. 1):
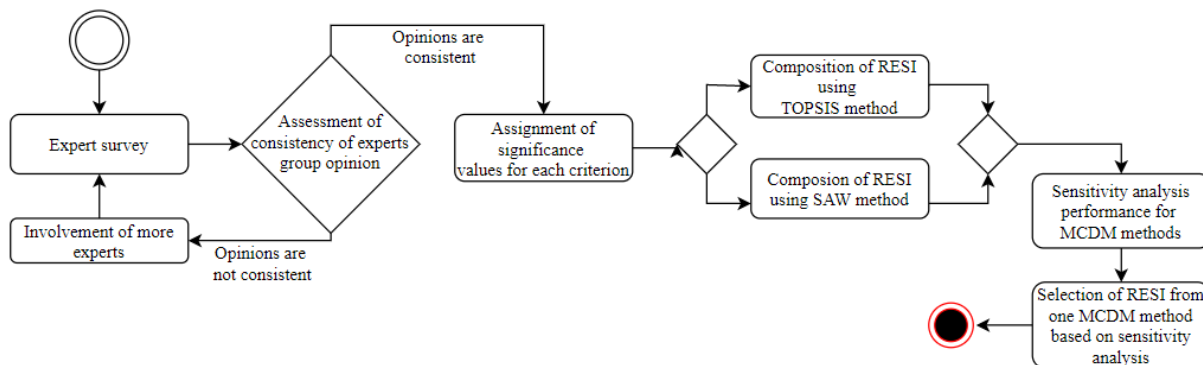
Fig. 1. RESI compilation algorithm

Source: authors

As can be seen from Figure 1, the process consists of six main steps:
1. Gathering information from the results of an expert survey;
2. Evaluating the consistency of group opinions;
3. Assigning significance values to each sustainability criterion based on the expert survey;

4.   Composing an index using two MCDM methods: SAW and TOPSIS;
5.   Performing sensitivity analysis on both MCDM methods;
6.   Selecting the final RESI from the indices generated by one of the MCDM methods.

In this paper, a two-stage expert survey was conducted to identify the most significant sustainability criteria for a real estate project. In the first stage, a survey form was designed and sent to 12 experts selected on the basis of their educational and professional background. The experts were asked to rate all criteria within each dimension on a 5-point scale ranging from 1 = least significant to 5 = most significant. Responses were received from nine experts, six of which have a PhD degree, with 5 to 19 years' experience related to project sustainability, one expert with a Master's degree and 5 years' practical experience, one professor with 10 years' experience, and one engineer with 15 years' practical experience in sustainable projects. The cut-off value was set at 3.5 to avoid having an excessive number of criteria, which could create biases and thereby influence results, leading to inappropriate evaluation of the final result (Dobrovolskienė et al. 2019). Consequently, only those criteria with the mean value equal to or higher than 3.5 were selected. As a result, a list of 18 significant sustainability criteria (5 environmental, 3 social, 5 economic, and 5 technological) was compiled, which was sent to the same nine experts in the second stage. The experts were asked to rank the criteria in the descending order of their significance, giving 18 points to the most significant criterion, and 1 point to the least significant one. The consistency of opinions was calculated using Kendall's concordance correlation coefficient (Ginevičius and Podvezko 2008):

$$W = \frac{12S}{m^2(n^3 - n)} \qquad (11)$$

where:
W is Kendall's coefficient of concordance;
S is the sum of the deviation of ranks from the mean;
n is the number of objects (criteria) ($i = 1, 2, …, n$);
m is the number of experts ($j = 1, 2, …, m$).

The value was calculated to be 0.58, which shows strong agreement between the expert opinions. Moreover, the reliability of the opinions was also calculated using Pearson's correlation coefficient ((12) formula):

$$\chi^2 = m(n - 1)W) \qquad (12)$$

is distributed by the χ^2 distribution with $\nu = n - 1$ degree of freedom. At the selected level of significance α, e.g., either 0.05 or 0.01, the critical value χ^2_{kr} is taken from the table of the χ^2 distribution with $\nu = n - 1$ degree of freedom. Where the value of χ^2 calculated according to formula (12) is greater than χ^2_{kr}, expert assessments are in agreement. The results indicate that the value of $\chi 2$ is higher than χ^2_{kr}, (88.953 > 37.1565) at the significance level α = 0.05. Consequently, these coefficients confirm that the opinions of the experts are consistent and reliable and therefore can be relied on in further research.

In view of the responses from the experts, the weight for each criterion was determined. The results of the expert assessment and the type of each criterion (minimizing or maximizing) are set out in the table below (Table 1).

Table 1. Weights and types of sustainability criteria

Dimension and criterion	Code	Weight coefficient in a group	Total weight coefficient	Type
Environmental		**0.297**		
Emission of CO2	C1	0.333	0.099	Min
Use of renewable energy	C5	0.241	0.071	Max
Waste management	C7	0.214	0.064	Max
Post construction energy consumption	C12	0.142	0.042	Min
Dust reduction	C18	0.070	0.021	Min
Social		**0.170**		
Safety and well-being of workers	C2	0.576	0.098	Max
Improvement of the life quality	C10	0.271	0.046	Max
Safety of infrastructure	C17	0.153	0.026	Max
Economic		**0.224**		
Quality control	C6	0.299	0.067	Max
Time of construction	C11	0.191	0.043	Min
Reduction of direct costs	C13	0.186	0.042	Min
Reduction of non-direct costs	C14	0.180	0.040	Min
Economic benefit for the region	C15	0.145	0.032	Max
Technological		**0.309**		
Employment of innovative technologies	C3	0.278	0.086	Max
Overall project quality	C4	0.236	0.073	Max
Technical risks throughout the project life-cycle and feasibility	C8	0.202	0.062	Min
Degree of intellectual property protection (patents, trademarks, copyrights)	C9	0.194	0.060	Max
Cost of technology	C16	0.091	0.028	Max

Source: authors

Moreover, indication of the criteria type leads to the step of criteria normalization which is based on the highest maximizing and lowest minimizing values out of three analyzed alternatives. For SAW method, normalization is calculated by applying (1) formula and (2) formula based on the negative (min) or positive (max) impact on sustainability and formula (4) is used to calculate normalized values for the TOPSIS method.

After normalization of variables, the next step is to derive index by applying SAW and TOPSIS methods. As mentioned earlier, SAW method is a summarization of weights, and thus, the sustainability index using this method is calculated based according to formula (3):

$$RESI = 0.099C_{N1} + 0.098C_{N2} + 0.086C_{N3} + 0.073C_{N4} + 0.071C_{N5} + 0.067C_{N6} + 0.064C_{N7} + 0.062C_{N8} + 0.060C_{N9} + 0.046C_{N10} + 0.043C_{N11} + 0.042C_{N12} + 0.042C_{N13} + 0.040C_{N14} + 0.032C_{N15} + 0.028C_{N16} + 0.026C_{N17} + 0.021C_{N18}$$ (13)

The value of index falls between 0 and 1, where the value closer to 1 indicates higher sustainability level.

Also, RESI is composed using TOPSIS method which allows us to identify relative closeness to the ideal solution and thus, the sustainability index using this method is calculated based on (10) formula:

$$RESI = \frac{\sqrt{\begin{array}{l}\left(0.099C_{N1} - W_j^-\right)^2 + \left(0.098C_{N2} - W_j^-\right)^2 + \\ \left(0.086C_{N3} - W_j^-\right)^2 + \left(0.073C_{N4} - W_j^-\right)^2 + \\ \left(0.071C_{N5} - W_j^-\right)^2 + \left(0.067C_{N6} - W_j^-\right)^2 + \\ \left(0.064C_{N7} - W_j^-\right)^2 + \left(0.062C_{N8} - W_j^-\right)^2 + \\ \left(0.060C_{N9} - W_j^-\right)^2 + \left(0.046C_{N10} - W_j^-\right)^2 + \\ \left(0.043C_{N11} - W_j^-\right)^2 + \left(0.042C_{N12} - W_j^-\right)^2 + \\ \left(0.042C_{N13} - W_j^-\right)^2 + \left(0.040C_{N14} - W_j^-\right)^2 + \\ \left(0.032C_{N15} - W_j^-\right)^2 + \left(0.028C_{N16} - W_j^-\right)^2 + \\ \left(0.026C_{N17} - W_j^-\right)^2 + \left(0.021C_{N18} - W_j^-\right)^2 \end{array}}}{\sqrt{\begin{array}{l}\left(0.099C_{N1} - W_j^+\right)^2 + \left(0.098C_{N2} - W_j^+\right)^2 + \\ \left(0.086C_{N3} - W_j^+\right)^2 + \left(0.073C_{N4} - W_j^+\right)^2 + \\ \left(0.071C_{N5} - W_j^+\right)^2 + \left(0.067C_{N6} - W_j^+\right)^2 + \\ \left(0.064C_{N7} - W_j^+\right)^2 + \left(0.062C_{N8} - W_j^+\right)^2 + \\ \left(0.060C_{N9} - W_j^+\right)^2 + \left(0.046C_{N10} - W_j^+\right)^2 + + \\ \left(0.043C_{N11} - W_j^+\right)^2 + \left(0.042C_{N12} - W_j^+\right)^2 + \\ \left(0.042C_{N13} - W_j^+\right)^2 + \left(0.040C_{N14} - W_j^+\right)^2 + \\ \left(0.032C_{N15} - W_j^+\right)^2 + \left(0.028C_{N16} - W_j^+\right)^2 + \\ \left(0.026C_{N17} - W_j^+\right)^2 + \left(0.021C_{N18} - W_j^+\right)^2 \end{array}} + \sqrt{\begin{array}{l}\left(0.099C_{N1} - W_j^-\right)^2 + \left(0.098C_{N2} - W_j^-\right)^2 + \\ \left(0.086C_{N3} - W_j^-\right)^2 + \left(0.073C_{N4} - W_j^-\right)^2 + \\ \left(0.071C_{N5} - W_j^-\right)^2 + \left(0.067C_{N6} - W_j^-\right)^2 + \\ \left(0.064C_{N7} - W_j^-\right)^2 + \left(0.062C_{N8} - W_j^-\right)^2 + \\ \left(0.060C_{N9} - W_j^-\right)^2 + \left(0.046C_{N10} - W_j^-\right)^2 + \\ \left(0.043C_{N11} - W_j^-\right)^2 + \left(0.042C_{N12} - W_j^-\right)^2 + \\ \left(0.042C_{N13} - W_j^-\right)^2 + \left(0.040C_{N14} - W_j^-\right)^2 + \\ \left(0.032C_{N15} - W_j^-\right)^2 + \left(0.028C_{N16} - W_j^-\right)^2 + \\ \left(0.026C_{N17} - W_j^-\right)^2 + \left(0.021C_{N18} - W_j^-\right)^2 \end{array}}}$$ (14)

The value of index falls between 0 and 1, where value closer to 1 indicates higher sustainability level.

Sensitivity analysis on MCDM methods and indices is performed by evaluating the change in the project rank when the initial input variables x_{ij} are altered by $\pm \lambda\%$ (where $\lambda = \pm 1\%; \pm 2\%; \pm 3\%; \pm 4\%; \pm 5\%$). Alternatives A1, A2 and A3 correspond to the three analyzed real estate projects and the initial results are the values obtained from formula (13) and formula (14). These alternatives are ranked on the basis of the results obtained from these formulas, where the highest value corresponds to the highest rank of the alternative. Then, the sustainability of real estate projects is calculated once again by applying formula (13) and formula (14). Finally, the sustainability of real estate projects is recalculated by varying the inputs according to formula (13) and formula (14). The results are summarized in the table 2 below.

Table 2. MCDM methods sensitivity analysis based on the project's rank change

± λ%	SAW			TOPSIS		
Alternatives	A1	A2	A3	A1	A2	A3
Initial results	0.551	0.518	0.755	0.421	0.363	0.602
Initial rank	2	3	1	2	3	1
	Rank did not change			Rank changed		
1%	2	3	1	3	1	2
2%	2	3	1	3	1	2
3%	2	3	1	3	1	2
4%	2	3	1	3	1	2
5%	2	3	1	3	1	2

Source: authors

As Table 2 shows, sensitivity analysis was performed on two MCDM methods, SAW and TOPSIS. Changes in certain initial variables under sensitivity analysis on the SAW method do not affect the final solution and the rank ordering remains the same at all analyzed levels of percentage change. That is, the SAW method is not sensitive to changes in variables. On the other hand, under sensitivity analysis on the TOPSIS method, the rank ordering of the projects changes within 1% of change. Therefore, the results of the MCDM sensitivity analysis show that the TOPSIS method is more sensitive to changes in baseline data than the SAW method.

The same results were observed by authors in other studies. For example, Simanavičienė and Ustinovičius (2011) performed sensitivity analysis by applying uniform and normal distributions. For both distributions, the TOPSIS method was more sensitive compared to the SAW method. In their study, in the case of uniform distribution, where the possible error rate of the initial variables is already above 2%, the ranking of alternatives changed where the TOPSIS method was used.

4. Conclusions

The literature analysis revealed that MCDM methods are successfully utilized in creating sustainability assessment tools. It also showed that in order to determine whether the final result would be different in the case of changes in the initial values of variables, sensitivity analysis on MCDM methods must be performed.

In this paper, sustainability assessment of a real estate project was examined by using two different multiple-attribute decision-making methods. This comparative study allowed identifying a suitable MADM algorithm that can be used to assess the sustainability of a real estate project. The results obtained by using TOPSIS and SAW showed that these two models produce different rankings. The sensitivity analysis on MADM methods revealed that the initial project rank of the SAW method, compared to the TOPSIS method, is more reliable (100% reliability), as it remained unchanged at any analyzed level of percentage change.

The present research has some limitations, which will be addressed in future studies. The proposed sustainability assessment tool is based on the SAW and TOPSIS methods. In future research, the authors will use other multiple-attribute decision-making methods to verify the obtained results.

Finally, the research makes a valuable contribution to the real estate sector and project management by equipping decision-makers with a tool that allows: 1) assessing the sustainability level of a real estate project; and 2) comparing projects with each other in order to decide on their financing.

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Dr Nomeda DOBROVOLSKIENĖ is an Associate Professor of the Department of Financial Engineering, Faculty of Business Management at Vilnius Gediminas Technical University, Lithuania. Her research interests are: Projects, Project Management, Project Portfolio, Project Portfolio Management, Sustainability, Multi-Criteria Decision-Making.
ORCID ID: orcid.org/0000-0002-1606-9980

Anastasija POZNIAK is a bachelor of finance. Her research interests are: Real Estate Projects, Project Portfolio Management, Sustainability, Multi-Criteria Decision-Making.
ORCID ID: orcid.org/0000-0003-1313-1280

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THE ROLE OF SMES IN WATER SUPPLY AND SEWERAGE: A CASE OF KAZAKHSTAN[*]

Anna Shevyakova [1,2], Yelena Petrenko [3,4]

[1] LLP "Kurylysexpertproject", st. Erubaeva, 5 Karaganda 100 000, Republic of Kazakhstan
[2] PI "Academy Bolashaq", st. Erubaeva, 16, Karaganda 100 000, Republic of Kazakhstan
[3] Plekhanov Russian University of Economic, Stremyanny lane 36, Moscow 117 997, Russia
[4] LLP "Rational solutions" Microdistrict Orbita-1 11/1, Karaganda 100 000, Republic of Kazakhstan

E-mails: [1,2] shevyakova.anna@gmail.com; [3,4]petrenko_yelena@bk.ru

Abstract. The article examines the problems and features of the state of the life-supporting infrastructure, namely the water supply and wastewater disposal sector on the example of Kazakhstan. The role and prospects for the development of small and medium-sized businesses for the development of this sector are also determined. The results of the SWOT analysis of the development of the water supply and sanitation sector in Kazakhstan (taking into account the implementation of state investment programs) are presented, as well as the analysis of existing problems and a number of recommendations on the results of the study.

Keywords: Kazakhstan; water supply; sewerage; small and medium-sized enterprises (SMEs); state regulation of the economy; tariffs; life-supporting infrastructure

1. Introduction

The Republic of Kazakhstan's water supply and sanitation sector has a fully formed consistent and functional legal framework – despite its fragmented nature and a number of specific shortcomings. Legislation on water resources and water supply is exhaustive. However, at the same time, it is fragmented and contained in a large number of legal documents.

Over the past decade, major state investment programs have allowed Kazakhstan to improve significantly the quality of water supply and sanitation services. However, main problematic aspects remain relevant. Level of service in cities is very high: centralized water supply services cover almost the entire cities, and almost all enterprises in the sector provide water continuously and meet all the acceptable standards of suitability for drinking purposes. Despite these important achievements, the sector still requires both investment and improved participant competencies.

In particular, investments are needed to ensure full coverage of water supply and sanitation services for the rural population, develop wastewater treatment infrastructure and bring them in line not only with the legislation in force in Kazakhstan, but also adaptation to more environmentally demanding European standards (if necessary). And also the need to resolve remaining issues related to the quality of the supplied water.

By regional standards, water utilities show generally acceptable performance indicators. Nevertheless, these can be improved, especially in small towns. Often, small or medium enterprises suffer from insufficient productivity and production capabilities.

Legislative framework and institutional structure are generally well defined and functional, but insufficient operational regulation weakens the effectiveness of services. Areas of responsibility in the sector are allocated clearly, and the main functions (policy development, regulation, and service delivery) are divided, which is a key condition for effective sector management.

Socially motivated tariff policy makes the sector dependent on constant budget support and a small number of major consumers as sources of income. Tariffs for water supply and sanitation services reflect the importance of social protection of domestic consumers, which guarantees them access to services at an affordable price.

The main task of water management is to provide all branches and types of economic activity with water in the required quantity and quality. According to the nature of water resources use, Kazakhstan's economy sectors are divided into water consumers and water users. To be consumed later on, water is withdrawn from open sources (rivers, lakes and reservoirs) and underground sources (aquifers) and is used in industry, agriculture, for municipal needs, and for other sectors of the economy. Water is a part of manufactured products, and water resources are subject to pollution and evaporation for various reasons.

Long-term development in the provision of public goods and services can be thought of as a pendulum-like movement, in which trends toward public provision alternate with counter-movements toward increased privatization and the development of private initiatives, including small and medium-sized businesses. The trend toward public provision of life-supporting infrastructure services can be traced back to the nineteenth century, when urban services such as water and sewerage began to provide these services with high initial investment.

The trend toward the formation of natural monopolies in the water sector culminated in the theory of the convergence of economic systems in socialist planned economies and capitalist market economies for increasing state provision of services and economic control in market economies (see, for example, Tinbergen, 1959, 1961; Boettcher, 1970). At the same time, however, there was also strong criticism of the repulsion of private enterprise and state encroachment into more and more areas of the economy (Friedman, 1962; Hayek, 1960).

After World War II there was an expansion of the state supply of goods and services in market economies, supported by few economists (see above, also Shirley, Walsh, 2000; Shleifer, 1998). The idea of public (monopoly) provision of services has begun to lose ground due to growing criticism of the inefficiency of public corporations, especially in the last two decades of the 20th century. This also applies to areas that have always

been provided by the public sector, namely life-supporting infrastructure and utilities, including the water and wastewater sector.

From a global perspective, water-related problems are primarily related to water scarcity, quality, and distribution (e.g., RobecoSAM, 2015). The problems facing water and wastewater utilities are more narrowly focused:
- interrelated social issues, such as population growth, urbanization, migration, changing lifestyles, access to water (rural and urban), sanitation and hygiene, water supply, and improving environmental attitudes toward water resources;
- technological problems, namely technologies for improving water efficiency, water reuse and recycling;
- economic, which include socially oriented rather than financially recouped tariffs, aging infrastructure, attempts to denationalize the established monopoly enterprises (case of Kazakhstan), strengthening the role of SMEs in the water supply and sanitation sector;
- ecological: reduction of fresh water reserves, persistent drought, ground water depletion, agricultural productivity and climate change resilience, ecosystem pollution, waste management
- political problems (models of communal property, watershed and cooperation between states that own territorial rights to use e.g. rivers, vulnerability of water rights system).

These problems have been described repeatedly in the works of scholars (Luebkeman, 2015; Weerd Meester et al., 2017a; Water JPI, 2016, Dietz et al., 2014; Wehn de Montalvo and Alaerts, 2013; Ipektsidis et al., 2016; Moumen et al., 2019). Moreover, many developing countries lack a solid knowledge base and capacity at different levels (water professionals, organizations, enabling environment, and society) to address these issues and to maintain and improve the management of the water and wastewater sector through change and innovation.

Issues of economic development, taking into account regional specificities, the peculiarities of the formation of economic and political associations, related to the quality of life, the level of development of life-supporting infrastructure, the role of SMEs in the utility sector, issues of innovation, have been repeatedly considered in the works of economists and sociologists (Goley, 1988; Ferrucci, 1995; Garn, 1997; Gregg, 1989; Hong, 1993; Ishigure, 1991; Kiparsky et al, 2013; Krozer et al., 2010; Lobina, 2012; Martins,Williamson, 1994; Miller, 1990; Oka et al., 1996; Palfai et al., 1998; Partzsch, 2009; Peuckert et al., 2012; Robbins, 1998; Hartman et al, 2017; Sirkiä et al., 2017; Barripp et al., 2004; Bowmer, 2004; Thomas, Ford, 2005; Daniell et al, 2014; Wehn, Evers, 2015; Mvulirwenande et al., 2017; Ngo Thu, Wehn, 2016; Gharesifard, Wehn, 2016; Pascual et al., 2013; Boronenko, Lavrinenko, 2015; Shevyakova, Petrenko, 2019; Ślusarczyk et al., 2020; Maldonado Narváez, 2020; Tvaronaviciene, Burinskas, 2020).

The main problem of research in the field of increasing the role of small and medium-sized businesses in the water supply and sanitation sector is that they fix the already existing situation and look for ways to adapt to the changing conditions of the current reality. Researchers very often do not take into account that changes in the existing utility systems and life-supporting infrastructure in individual countries are primarily possible only after changing the regulatory framework and reducing the level of monopoly and state interference. The focus remains on the instrumental level, individual proposals and the search for barriers, but not ways to remove them.

The main issue of this study is to assess the state of the water and wastewater sector in Kazakhstan and the role of small, medium-sized businesses in it.

Objectives of the study:
- To provide a cost-effective and comprehensive analytical study of the water and wastewater sector in Kazakhstan and the role of SMEs in it;
- Evaluating the development of the competitive environment for SMEs in the water sector of Kazakhstan, opportunities for improving the capacity of engineering and manufacturing organizations through the growth of

professional competencies of specialists;
- Evaluating the attractiveness of the water supply and sanitation sector in Kazakhstan and assessing the attractiveness of this sector;
- elaboration of proposals on building a system of training and staff development, schemes for organizing educational services and a set of tools to support small and medium-sized enterprises.

The main water consumer is the production sphere (real sector), which is a set of industries and activities resulting in a material product (a vendible). Material production sectors usually include industry, agriculture, transport, and communications.

Water management also affects the non-productive sector, a service sector, which includes activities that do not create a material product:
- Housing and communal services;
- Non-industrial types of consumer services for the population;
- Health, physical education and social security;
- Education;
- Finance, credit, insurance, pension provision;
- Culture and art;
- Science and scientific service;
- Management;
- Public associations, including professional associations.

Provision of water resources to all producers, both in agriculture and in the extractive and processing industries, requires appropriate water supply services, i.e. appropriately staffed enterprises.
Industrial water consumption is characterized by the following: Large volumes of water consumption and sanitation; a small percentage of non-returnable water consumption; a large dependence of the water consumption taken from the source on the production technology and water supply system; a variety of water use functions; uniformity of water consumption throughout the year; a large share in the pollution of water sources.

Complexity of water supply systems for industrial enterprises is determined not only by their multifactorial nature and their interdependence, but also by the features of return and repeated use of water in technological processes, a variety of schemes for wastewater disposal and regeneration, extraction of valuable components from treated water, and significant costs for the construction of water supply and sanitation systems. The structure of the entire water supply system depends on the source type: technological scheme, types and number of structures included, water supply stability, construction price and operating costs.

At the same time, the main thing that any water supply project should provide for industrial enterprises, cities and rural localities is drinking quality; required quantity; optimal capacity that does not harm the ecology of the reservoir; the shortest distance from the source to the consumer.

2. Diagnostics of the state of the water supply and sanitation sector in Kazakhstan

Table 1 shows the sections and chapters of the CCEA of the Tax Code of the Republic of Kazakhstan 03-2019 corresponding to the sector of the economy related to water management.

Table 1. CCEA sections and chapters

Section	Chapter	Group	Class	Class name	Subclass	Subclass name
A	01	01.6	01.61	Activities supporting crop production	01.61.2	Operation of irrigation systems
E	36	36.0	36.00	Water collection, treatment and distribution	36.00.0	Water collection, treatment and distribution
	37	37.0	37.00	Wastewater collection and treatment	37.00.0	Wastewater collection and treatment
F	41	41.0	41.10	Development of construction projects	41.10.0	Development of construction projects
	42	42.2	42.21	Construction of pipelines	42.21.2	Construction of pipelines for water supply and sewerage systems
		42.9	42.91	Construction of water facilities	42.91.0	Construction of water structures
G	46	46.6	46.66	46 Wholesale trade, excluding automobile and motorcycle business	46.66.0	Wholesale of other machinery, equipment, parts and accessories
M	71		71.12	Engineering surveys and provision of technical advice in this area	71.12.1	Engineering and technical design activities, excluding nuclear industry and nuclear power facilities
	72	72.1	72.19	Other natural and technical sciences related scientific research and experimental developments	72.19.9	Other natural and technical sciences related research and development
	74	74.9	74.90	Other professional, scientific, and technical activities not included in other groupings	74.90.2	Conformity assessment accreditation
					74.90.3	Activities of departmental services dealing with innovative technologies (medical, educational, consulting, etc.)
					74.90.9	Other professional, scientific, and technical activities not included in other groupings
P	85	85.3	85.32	Technical and vocational secondary education	85.32.1	Vocational and technical education
		85.4	85.42	Higher and postgraduate education	85.42.1	Higher education
					85.42.2	Postgraduate education
		85.5	85.59	Other types of education not included in other groupings	85.59.2	Types of education provided by national companies and their subsidiaries
			85.60	Support activities in education	85.60.1	Support activities in education provided by the national companies and their subsidiaries
					85.59.9	Other educational activities not included in other groupings
S	94	94.1	94.11	Activities of commercial, business and professional public organizations	94.11.0	Commercial and entrepreneurial public organization activities
					94.12.0	Professional public organizations activities
					94.20.0	Trade union activities

Source: composed by the authors

The water supply and sewerage sector (as a basic component of the water economy in Kazakhstan) consists of enterprises and organizations included, according to the registered data of the General Classifier of Economic Activities OKED NK RK 03-2019, in section E "Water supply; collection, processing and disposal of waste, activities to eliminate pollution. " This section includes activities related to the organization of collection,

treatment and disposal of various types of waste, such as solid or liquid industrial or domestic waste, as well as the collection and disposal of waste from contaminated sites. Products from a waste treatment or wastewater treatment process can either be disposed of or serve as raw materials for other manufacturing processes. Water supply activities are also classified under this section. Sections: 36 Collection, treatment and distribution of water; 37 Collection and treatment of waste water and 38 Collection, treatment and disposal of waste; utilization (recovery) of materials. Section 38 does not directly deal with water supply and sanitation.

Data on employment in sector E are shown in Table 2 and despite the fact that it averages 1% of employment in Kazakhstan, water supply and sanitation is the most important part of life-supporting infrastructure.

Table 2. Employment in Section E industries. Water supply; sewerage system, waste collection and distribution control (CCEA 36, 37, 38)

Indicators	Units of measure	2014	2015	2016	2017	2018
Employment in Section E Industries	Thousand people	86,5	81,9	80,2	74,2	80,4
In % of total employment	Per cent	1,0	1,0	0,9	0,9	0,9
For reference: Employed population, total	Thousand people	8510,1	8433,3	8553,4	8585,2	8695,0

Source: composed by the authors

In 2018, water supply companies in Kazakhstan supplied 2359.8 million m³ of water into the network, and more than a quarter of the water volume was passed through treatment facilities. In 2019, water supply companies supplied 2339.9 million m³ of water into the network, with a quarter of this volume passed through treatment facilities.

In 2018, 41.2% of all water supplied into the network was spent on the enterprises' own needs at the expense of electric power and manufacturing industry enterprises. Leakage water losses amounted to 217.8 million m³. In 2019, 40.1% of all water supplied into the network was spent on the enterprises ' own needs at the expense of electric power and manufacturing industry enterprises. Leakage water losses amounted to 241 million m³.

The volume of water released to consumers in 2018 amounted to 1168.3 million m³ of water, of which 44.2% to the population. The volume of water released to consumers in 2019 amounted to 1160.9 million m³ of water, of which 46.2% to the population, which can be seen in Figure 1.
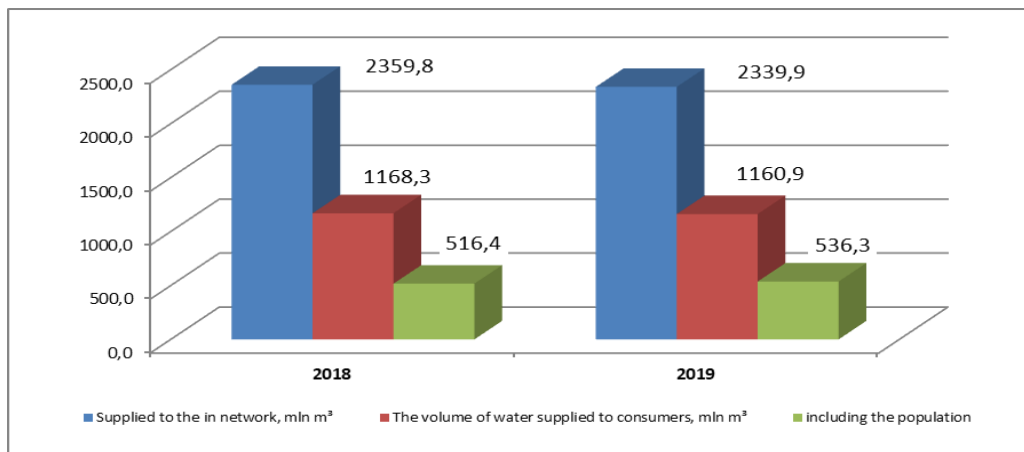
Fig. 1. Key indicators of the water supply sector in Kazakhstan

Source: composed by the authors

The total length of water pipelines in 2018 was 26.3 thousand km; of which 40.7 thousand km of street water supply networks; 11.9 thousand km of submain and yard networks. The total length of water pipelines in 2019 was 27.2 thousand km; of which 44.1 thousand km of street water supply networks; 12.6 thousand km of submain and yard networks.

In 2018, there were 573 sewer structures and 301 separate sewer networks operating on the territory of the Republic. In 2019, there were 599 sewer structures and 272 separate sewer networks operating on the territory of the Republic.

The length of the main sewers in 2018 was 4.6 thousand km. The street sewer network was 6.3 thousand km. The length of the main sewers in 2019 was 4.8 thousand km. The street sewer network was 6.6 thousand km. The installed capacity of treatment facilities in 2018 was 3828.4 thousand m³/day. 580.7 million m³ of wastewater was passed through the treatment facilities, so the share of treated wastewater in the total wastewater flow was 86.8%. In particular, 532.9 million m³ were purified by full-scale biological treatment, of which 5.7 million m³ with posttreatment, 472.6 million m³ with standard treatment, and 43.5 million m³ was insufficiently treated. The capacity of mechanical treatment facilities in 2019 was 1414.1 thousand m³/day, and 2731.4 thousand m³/day for biological treatment facilities (full cycle). 579.2 million m³ of wastewater was passed through the treatment facilities, so the share of treated wastewater in the total wastewater flow was 84.5%. In particular, 495.5 million m³ were purified by full-scale biological treatment, of which 124.7 million m³ with posttreatment, and 497.0 million m³ was discharged into natural water bodies.

Key challenges and barriers to creating an effective system of economic incentives for the water resources management sector include the following:

1. Unreasonably low (socially oriented) tariffs for end-users of water resources make the sector dependent on state subsidies (see Table 3).

Table 3. Average prices and tariffs for water use in Kazakhstan, end of period

No.	Indicators	Unit of measure	2012	2013	2014	2015	2016	2017	2018
Average prices and tariffs for paid services for the population									
1	Hot water	Tenge/m³	172	173	178	199	218	234	240
2	Cold water	Tenge/m³	35	45	48	57	65	71	73
3	Wastewater disposal	Tenge/m³	23	30	31	37	43	46	48
Purchase prices for certain types of products of production-technical purpose of the industrial enterprises									
4	Steam and hot water (heat energy)	Tenge/ Gcal	2958	3707	4127	4446	5284	5435	6410
5	Average annual exchange rate of the Euro (according to the National Bank of Kazakhstan) https://nationalbank.kz/ru/news/oficialnye-kursy	Tenge/ Euro	191,67	202,09	238,1	245,8	378,63	368,32	406,66
Average prices and tariffs for paid services for the population									
1.1	Hot water	Euro/m³	0,90	0,86	0,75	0,81	0,58	0,64	0,59
2.1	Cold water	Euro/m³	0,18	0,22	0,20	0,23	0,17	0,19	0,18
3.1	Wastewater disposal	Euro/m³	0,12	0,15	0,13	0,15	0,11	0,12	0,12
Purchase prices for certain types of products of production-technical purpose of the industrial enterprises									
4.1	Steam and hot water (heat energy)	Euro/Gcal	15,43	18,34	17,33	18,09	13,96	14,76	15,76

Source: composed by the authors

2. Payment system does not encourage the development of an effective water management system.

3. Limited access to investment, including borrowed funds of water supply and sanitation service providers.
Despite state's significant efforts to implement measures to transfer the costs of maintaining water facilities to self-financing at the expense of water users, currently the issues of recoupment of operating costs of water services, considering preventive maintenance, operating costs, capital repairs and renovations, remain open leaving many water services, especially those in rural areas, hanging on the verge of bankruptcy.

Level of tariffs for industrial consumers varies up to 350 tenge/m³ (including investment costs) and, therefore, is not comparable to the level of tariffs applied in other countries. Tariff level used does not cover the full cost of water supply (capital and operating costs). In addition to covering the cost of water supply, industrial consumers are usually forced to subsidize utility customers. Current tariffs for industrial enterprises are related only to the level of water consumption, which practically does not create incentives for the use of return water consumption and recycling.

Tariffs for utility customers are quite low and usually do not fully cover operating costs.
As a result of low tariffs, most consumers assume water is "shareware" and do not try to use it sparingly. This leads to low efficiency in the use of water resources by end users and unproductive consumption of water by agricultural consumers and the population. For the industrial sector, current water tariffs provide little economic incentive to invest in water-saving technologies.

Tariffs for sewage services also provide insufficient incentives to reduce pollution and treat wastewater. Industrial wastewater tariffs do not depend on both quality and degree of wastewater treatment. Despite the existence of detailed methodologies in Kazakhstan, their application is hampered by the lack of continuous and widespread monitoring of water quality and the ability to impose effective penalties for violations. Agricultural sector of Kazakhstan does not apply wastewater tariffs, so there are no incentives to maintain drainage systems.

The results of the SWOT analysis of Kazakhstan's water supply and sanitation sector development (taking into account the implementation of state investment programs) are presented in Table 4.

Table 4. SWOT analysis of Kazakhstan's water supply and sanitation sector development

1. Strengths	2. Weaknesses
For the whole country	
1.1 Urban population growth trends (i.e., an increase in the number of service users). 1.2. High share of large cities of Almaty and Nur-Sultan in the country's GDP and a growing demand for water supply (pilot projects for training and creation of specialized Training centers are possible). 1.3. Dynamic development of the service sector in major cities (Nur-Sultan and Almaty), including those provided by SMEs (education, health, culture and leisure) and, consequently, an increase in the need for water supply and sanitation. 1.4. Creation of a favorable environment for the development of a modern (innovative) and "green" economy in large cities and, consequently, increase in the need for highly qualified experts. 1.5. Transport connectivity of the capital with the regions.	2.1. A gap in the urbanization level of developed countries. 2.2. Low competitiveness of major cities at the global and regional (Eurasian) markets. 2.3. Regional disparities in the quality of life, especially between urban and rural localities. 2.4. Low level of diversification of economy of mono and small cities, and rural settlements.

Exclusively in the water supply and sanitation sector	
1.6. A continuous state support for the development and modernization of the housing and utilities system (possibility of financing the projects). 1.7. Already existing relatively high degree of coverage of the urban population with centralized water supply and sanitation. 1.8. Work has continued on using the potential of underground water to provide the population with access to drinking water (this is especially relevant for rural localities), therefore, the emergence of new SMEs for the operation and maintenance of water intake structures and, as a result, an increase in the need for qualified personnel.	*2.5. Critical shortage and aging of existing qualified personnel (with higher education, technical and special education) in the water supply and sanitation sector.* *2.6. Underdevelopment and absence of practice orientation in the system for training of personnel with modern skills and competencies for the water supply and sanitation sector.* 2.7. Low level of population awareness on processes taking place in the water supply and sanitation sector, tariff formation, advantages of new technologies, systems of economy and consumption accounting. 2.8. Mismatch of engineering and social infrastructure, high wear of water supply, sewerage, heat and electricity networks, local inner-city roads, especially those in small and single-industry towns and rural localities. 2.9. Lack of alternative sources of financing for the modernization of engineering infrastructure in cities (other than the state budget). 2.10. Low level of implementation of new technologies in the housing and communal dervices system.
3. Opportunities	**4. Threats**
For the whole country	
3.1. Development of mobile labor market in large cities. 3.2. Formation and expansion of sales markets in agglomerations and large cities, including those for water supply and sanitation services. 3.3. Implementation of strategies for the development of major cities until 2050. 3.4. Improvement of the quality of life through technological (innovative) development of large cities, mono, and small cities, rural settlements in the implementation of a state investment programs.	4.1. An ongoing pandemic and tightening of sanitary-epidemiological regime. 4.2. Investment unattractiveness of small and single-industry towns and rural settlements remote from large cities. 4.3. Mass unemployment due to the shutdown of city-forming enterprises in small and single-industry towns, as well as rural areas, and, consequently, the lack of funds to pay for water supply and sanitation services.
Exclusively in the water supply and sanitation sector	
3.5. Introduction of PPP mechanisms to increase the investment attractiveness of the water supply and sanitation sector. 3.6. Introduction of new technologies and digitalization in the water supply and sanitation sector to increase the service life of engineering infrastructure, reduce losses, and automate production processes. 3.7. Development of the education system for the training of qualified personnel with necessary skills and competencies at all levels of training (pilot projects for training and creation of specialized Training centers are possible).	4.4. Excessive strain on urban infrastructure. 4.5. Lack of a system of educational institution (universities, colleges, etc.) orders of specialists from operating organizations in training areas. 4.6. Lack of centers for professional development and competence development, both at the operating enterprises themselves, and in general in Kazakhstan. 4.7. Reduction of state support for the modernization of engineering infrastructure due to budget constraints. 4.8. Weakening of the national currency, which will lead to an increase in prices for imported construction materials and equipment.

Source: composed by the authors

In Kazakhstan, the expected trends of increasing water consumption and decreasing water availability threaten to increase the regional deficit, which six of the eight water basins in Kazakhstan may face by 2025. According to available estimates, by 2040, Kazakhstan may face a significant shortage of water resources for 50% of the need.

Speaking of reducing the threat of water scarcity in recent years, we have noted only one positive trend in the management of water resources in Kazakhstan, namely, a transition to the basin principle of water resources management, which corresponds to the best international practices. We can also note an increased financing of water management and hydro-reclamation infrastructure through the implementation of state programs, which helps to reduce water losses and improve infrastructure safety.

However, despite improvements in water resources management, a significant number of issues in the water supply and sanitation sector remain unresolved:

1. Most efforts to prevent shortages focus on infrastructure development rather than reducing water demand.
2. Low efficiency of use (productivity) of water resources in Kazakhstan.
3. The existing tariff structure, especially in agriculture and for the population, does not encourage efficient use of water resources and does not allow investors to cover owner operating and capital costs.
4. Efforts to promote efficient use of water resources are insufficient in all sectors, but most of all in agriculture, where losses are up to 66%.
5. There is a lack of investment in infrastructure, both in the construction of new facilities to provide access to water and in the maintenance of existing infrastructure.
6. Access to water resources remains an issue: 84.4% of the population of Kazakhstan has access to quality drinking water in rural areas (94.5% in urban areas), and 68.7% is the coverage by wastewater treatment in cities (much lower in rural areas), while in most developed countries these indicators are close to 100%. Source: Decree of the Government of the Republic of Kazakhstan dated December 31, 2019 No. 1054 "On approval of the state program of housing and communal development "Nurly Zher" for 2020—2025".
7. More than 40% of main and distribution channels are in poor condition.
8. A significant part of the irrigation and drainage infrastructure is in a derelict state.
9. Some key water management mechanisms are not well developed or are missing, and there is also a lack of a strategic approach to water sector management.
10. A poor coordination of water resources management between various ministries and agencies.
11. Water sector lacks experts and managers skilled enough to project the balance of water resources, optimize capital investments, and improve the efficiency of water consumption.
12. The trend of growth in recent years of material damage from harmful effects due to high flows, floods, changes in the banks of water bodies, flooding of territories with groundwater, waterlogging and salinization of land, water erosion.
13. Limited allocation of funds for the repair of hydraulic structures, which leads to the aging of the main water resources.
14. There is no order for the delivery of experts from operating companies and water sector infrastructure enterprises.

Strategy for the development of the water supply and sanitation sector should consider current priorities:
- Value of human capital,
- Expert competence,
- Qualification development system,
- Reliable water volumes and quality review,
- World level of technological development,
- Achievements in the methodology of long-term planning and projection,
- Effective plans of action for the environment protection.

The lack of strategic approach leads to a reduction in the level and quality of water, water infrastructure wear, water pollution, degradation of aquatic and related catchment area terrestrial ecosystems; threatens regions of the country (half of regions) already restricted in water supplies to increase water scarcity even more.

3. Assessment of the role of SMEs in the water supply and sanitation sector in Kazakhstan

Small and medium-sized businesses (SMEs) are the backbone of the economic development of any state, and Kazakhstan is no exception. It is the level of development of SMEs that largely determines the solution of employment problems, filling the domestic market with domestic goods and creating a competitive environment.

Small and medium enterprises in the Republic of Kazakhstan include legal entities, individual entrepreneurs and peasant or farm agricultures whose activities are regulated by the Business Code of the Republic of Kazakhstan. Small business entities are individual entrepreneurs without incorporation of legal entity and legal entities engaged in entrepreneurship with an average annual number of employees not exceeding one hundred people and an average annual income not exceeding three hundred thousand times the monthly calculation index established by the law on the Republican budget and effective as of January 1st of the corresponding financial year.

Medium businesses are individual entrepreneurs and legal entities engaged in business, which are not small or large businesses.

Individual entrepreneurship is an independent, initiative activity of citizens of the Republic of Kazakhstan, oralmans, aimed at obtaining a net income, and based on the property of individuals themselves and carried out on behalf of individuals, at their risk and under their property responsibility.

As of January 1, 2020, number of operating small and medium enterprises (hereinafter referred to as SMEs) amounted to 1330.2 thousand units. The number of employees in SMEs as of January 1, 2020 was 3448.7 thousand people. The output of products (goods and services) by SMEs in 2019 amounted to 32387 billion tenge.

Tables below show the number of small enterprises in Section E.

Table 5. Number of registered subjects of small entrepreneurship (units)

Indicators	Total	Including	
		Small businesses	**Individual entrepreneurs**
Total as of April 1st, 2020	**1 579 894**	**387 247**	**970 625**
Industry	65 324	30 214	35 110
Water supply; waste collection, treatment and disposal, pollution remediation	3 490	2 179	1 311
Percentage of registered SMEs as of April 1st, 2020	**0.22%**	**0.56%**	**0.14%**
Total as of January 1st, 2020	**1 601 081**	**383 240**	**996 550**
Industry	65 447	29 906	35 541
Water supply; sewerage, waste collection and distribution control	3 445	2 169	1 276
Percentage of registered SMEs as of January 1st, 2020	**0.22%**	**0.57%**	**0.13%**
Total as of January 1st, 2019	**1 574 789**	**369 823**	**999 731**
Industry	61 172	29 140	32 032
Water supply; sewerage, waste collection and distribution control	3 163	2 057	1 106
Percentage of registered SMEs as of January 1st, 2019	**0.2%**	**0.56%**	**0.11%**
Total as of January 1, 2018	**1 537 633**	**349 025**	**993 621**
Industry	59 063	28 373	30 690
Water supply; sewerage, waste collection and distribution control	2 950	1 958	992
Percentage of registered SMEs as of January 1st, 2018	**0.19%**	**0.56%**	**0.1%**

Source: composed by the authors

Table 6. Number of active small enterprises (units)

Indicators	Total	Including	
		Small business entities	Individual entrepreneurs
Total as of April 1st, 2020	**1 316 037**	**264 931**	**836 830**
Industry	51 162	20 734	30 428
Water supply; waste collection, treatment and disposal, pollution remediation	2 704	1 549	1 155
Percentage of registered SMEs as of April 1st, 2020	**0.21%**	**0.58%**	**0.14%**
Total as of January 1st, 2020	**1 327 742**	**258 365**	**855 920**
Industry	50 978	20 348	30 630
Water supply; sewerage, waste collection and distribution control	2 628	1 518	1 110
Percentage of registered SMEs as of January 1st, 2020	**0.2%**	**0.59%**	**0.13%**
Total as of January 1st, 2019	**1 238 708**	**231 325**	**809 115**
Industry	44 863	18 621	26 242
Water supply; sewerage, waste collection and distribution control	2 264	1 340	924
Percentage of registered SMEs as of January 1st, 2019	**0.18%**	**0.58%**	**0.11%**
Total as of January 1, 2018	**1 143 376**	**208 742**	**747 107**
Industry	41 692	18 053	23 639
Water supply; sewerage, waste collection and distribution control	2 075	1 290	785
Percentage of registered SMEs as of January 1st, 2018	**0.18%**	**0.62%**	**0.11%**

Source: composed by the authors

As seen from the presented data, the number of SMEs is increasing, even considering pandemic starting March 2020. However, the share of SMEs in the total number of both registered and operating entities remains nearly stable.

Proper regulation of business activity - it is a powerful tool that can help SMEs overcome serious barriers, such as low productivity and corruption. By world standards, there are many SMEs in Kazakhstan, but their contribution to the economy is low (see data in Table 7 and Figure 2).

Table 7. Output of products by SMEs by type of economic activity, KZT mln

Indicator name	2015	2016	2017	2018	2019
Total	15 699 405	19 609 010	23 241 125	26 473 049	32 386 960
Agriculture, forestry and fisheries	1 298 194	1 540 413	1 822 652	2 057 209	2 510 170
Industry	3 128 662	4 305 235	4 713 248	5 687 301	6 453 733
Water supply; sewerage system, control over the collection and distribution of waste	69 783	117 615	130 762	132 653	116 997
Construction	3 033 443	3 990 829	3 963 633	3 979 704	5 239 904
Financial and insurance activities	285 895	182 241	461 536	274 764	289 505
Professional, scientific and technical activities	1 116 794	1 430 320	1 863 875	1 819 601	2 213 320
Education	102 703	128 955	165 506	188 216	244 568
Provision of other types of services	307 601	379 529	539 955	759 201	835 089

Source: composed by the authors
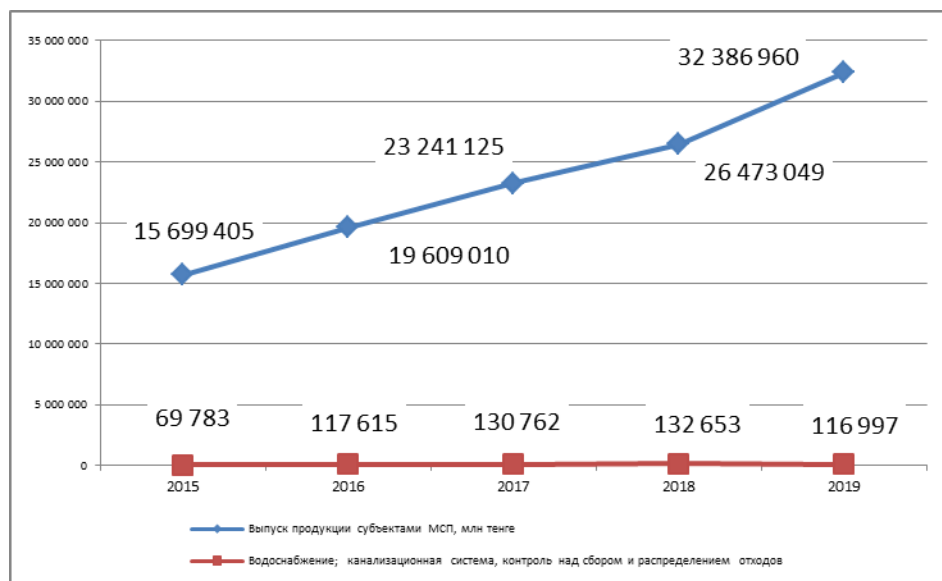
Fig. 2. Output of products by SMEs in section E, million tenge

Source: composed by the authors

To increase their contribution to the economy, entrepreneurs should spend less time on administrative matters and more on developing their businesses and creating jobs.

This requires effective regulation of business activities. The state has already set a goal to double the contribution of SMEs to the economy by 2050 up to 50% compared to 25% at present, and to increase the level of productivity, which has been declining in recent years.

Despite the relative speed and lower costs, there are still challenges associated with the complexity of procedures. The process of meeting regulatory requirements in Kazakhstan is still more burdensome than that in the OECD countries, Europe and Central Asia. Problems remain, in particular, in obtaining construction permits, as entrepreneurs need to get a large number of approvals both before and after construction. While it takes an average of 13 procedures to obtain a construction permit in high-income OECD countries and 16 procedures in ECA countries, in Kazakhstan, this process consists of an average of 18 procedures. In Almaty, where this process is the least burdensome, entrepreneurs still need to meet 17 requirements to obtain a construction permit.

In the context of rapid reforming, providing training for local interested persons on issues related to the applicable regulations is very difficult. The high turnover of staff in government agencies, especially in PSC contributes to that as well. Retention rates are generally low across the country. To ensure that entrepreneurs provide better services, it is necessary to find ways to retain trained employees, e.g., by offering them a clear and rewarding path to professional growth.

The output of small and medium-sized businesses in January-March 2020 amounted to 6528 billion tenge. In the total number of SMEs, the share of individual entrepreneurs was 63.5%, small business entities – 20.1%, peasant or farm enterprises – 16.2%, and medium businesses – 0.2%.

Monitoring reforms and assessment of their impact require high quality data across the country, regions and cities. Without access to detailed statistics, policy makers at both national and local levels are unaware of issues in some areas or are unable to explain them. However, statistics on the performance of government agencies, the level of

service use, and customer demand remain incomplete in most cases, and policy makers in the regions often do not have access to them. For example, there is no data on the number of entrepreneurs who have registered new companies on the e-government platform, be it independently or through the PSC, or on the number of entrepreneurs who use lawyer services.

Results of assessing water supply and sanitation sector's attractiveness for SMEs show that it is closer to the average, and the main reason is its high capital intensity and low profitability, as well as a high degree of government intervention and regulation, including in tariff setting.

Table 8 shows the results of the analysis of competitive forces in Kazakhstan's water supply and sanitation sector (using M. Porter method.)

Table 8. Results of the analysis of competitive forces in water supply and sanitation sector

Factors	Components	Projection	Impact	Threats	Reaction
Consumers	Water supply	Moderate growth in demand	Capacity utilization and expansion (creation of new ones)	Decrease in the incomes of the residents and a systemic economic crisis due to the pandemic impact, delayed payment and/or non-payment of invoices	Continuation of work (possibly with state support)
	Water discharge	Moderate growth in demand	Capacity utilization and expansion (creation of new ones)		
Suppliers	Energy carriers, reagents, materials, etc.	Rise in prices, growth of accounts payable	Expenditure growth	Exceeding the approved tariff estimates, losses	Supplier rotation, search for new forms of cooperation
Competitors	Number of competitors	Monopoly	Strengthening the market position	Low	Dictate terms to a reasonable extent

Source: composed by the authors
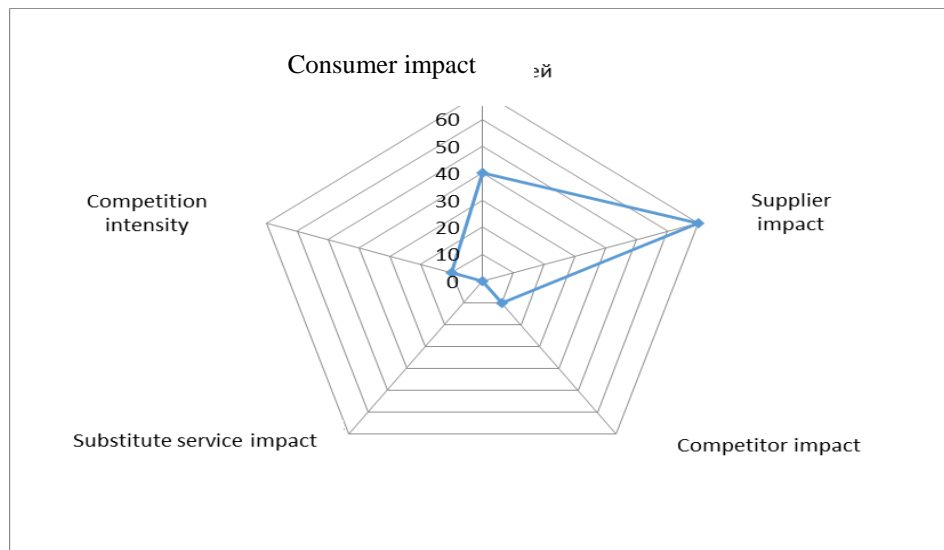
Fig. 3. Radar for assessing the impact of five competitive forces in the water supply and sanitation sector

Source: composed by the authors

In addition, we can note the following as factors reducing the W&S sector's attractiveness:
- Low financial resources;
- The lack of qualified human resources;
- Low level of protection of the entrepreneur rights; and
- Low utilization of public-private partnership and/or state support mechanisms.

4. Conclusion

Maintaining even the existing state of water and hydroelectric facilities, carrying out reconstruction of the entire system of water channels and numerous hydraulic structures, as well as research, design and construction of new water management facilities and protective structures are possible only in the presence of qualified performers at all levels: administrative, managerial, engineering and production personnel.

Personnel support for the development of the water sector of the economy is possible only in the presence of highly qualified experts, whose training under the state order has decreased in recent years, and, for example, in 2018, state order has removed the specialty "Hydraulic engineering." In Kazakhstan, 10 of 131 universities operating for the academic year 2020—2021 train industry experts; see sub-paragraph 7.1.1 for details.

The main reason for the decline in demand for water specialties among applicants and students is the discrepancy between their training and modern requirements of the market economy. All active specialists in the water sector are well aware of and understand the objective and subjective factors, which is shown by our survey and interviewing. Experts give the following reasons for the critical situation in providing the water sector with young experts:
- Training does not consider employer requirements, offers and demand in the labor market,
- Low attractiveness of working conditions and nature in reclamation and water management organizations,
- Insufficient level of remuneration in reclamation and water management organizations,
- Absence of order for the delivery of professionals from water sector operating companies and infrastructure companies;
- A bigger emphasis in educational institutions on a theoretical part, rather than on practical skills and abilities.

Many initiatives implemented in Kazakhstan for the development of SMEs involve active measures of state support and, thus, reduce the role of the market and may distort business incentives. Many of Kazakhstan's SME development programs make extensive use of import tariffs, soft loans, subsidies (including transport and operating subsidies, subsidized loans), support for quasi-public sector entities, taxes or export restrictions, origin requirements, etc. This creates an unequal environment for SMEs, which is compounded by the lack of transparency in the process of allocating subsidies. These SME development programs also lead to a shift in incentives for companies to receive subsidies instead of improving competitiveness. For example:

1) Small and medium businesses development in mono and small cities within the framework of the State Program for Business Support and Development Business Roadmap-2025, and the State Program for the Development of Productive Employment and Mass Entrepreneurship for 2017—2021 "Enbek";

2) Provision of basic state and social services stipulated by the legislation of the Republic of Kazakhstan, and a system of regional standards.

The draft state programs for the development of education and science of the Republic of Kazakhstan for 2020—2024 and the development of healthcare of the Republic of Kazakhstan for 2020—2025 provide for measures to increase the human capital of young people in cities that are not part of the FUR. This will allow the youth of mono and small cities to be competitive in the large city labor markets.

Current employment of the population of these cities will be supported under the Program for the Development of Productive Employment and Mass Entrepreneurship for 2017—2021 "Enbek", and the State Program for Business Support and Development "Business Roadmap-2025."

Two consequences of the current approach to increasing the role of SMEs are as follows:
- High perceived risk for private foreign investors;
- Insufficient attention to local SMEs.

Strong state control over economy and the state's interventionist approach to supporting SMEs create an environment in which mostly large companies with good connections and support thrive. As a result, foreign investors, excluding those in the oil and gas sector, value Kazakhstan on a par with Kyrgyzstan, Russia, and Ukraine because of commercial risks associated with weak competition policies (price controls, special interests, distorted decision-making, unfair competition practices, and discrimination against foreign companies).

At the same time, local SMEs, which usually play a leading role in innovation and growth in transition economies, make a very small contribution in Kazakhstan (relative to their share of GDP) compared to other countries.

The main constraints Kazakhstan faces while implementing an approach to economic growth based on the development of SMEs include the following:
- A protracted process of recovery of the financial sector, which does not provide active support for investors;
- A broad presence of the state in the economy, which affects competition in certain sectors;
- An impact of government support measures on creating a level playing field for businesses.

If we do not remove these restrictions, private investment in the water sector essential for the implementation of structural changes and achievement of a higher economic growth trajectory will be unlikely.

Reducing the state's presence in the economy and supporting the environment for SME development: Kazakhstan is well aware of the need to develop competitive, diversified SMEs, and there are appropriate strategies and programs to support necessary policies. However, a macroeconomic environment that weakens competitiveness, a financial sector that does not provide effective pricing and resource allocation, and a governance environment that has created unequal conditions in which quasi-public sector entities and connected companies displace SMEs and potential innovators undermine these efforts.

Development of a competitive, diversified SME requires reduction of the presence of quasi-public sector entities, including in key network industries such as water supply and sanitation. At the same time, broader measures will be required to support competitive markets by encouraging foreign direct investment (FDI), opening markets to imports, and other measures. Finally, there is a need for a more effective support for SMEs by improving the business regulatory environment and encouraging the development of competitive value chains instead of credit subsidies.

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Aknowledgements

Anna SHEVYAKOVA, Doctor of Economics. Her research interests are related to macroeconomics, economic diversification, regional specialization, budget financing and state support for entrepreneurship development, innovation and development of "smart" territories.
ORCID ID: orcid.org/0000-0002-2644-6292

Yelena PETRENKO, Doctor of economics, professor, Plekhanov Russian University of Economic. She is an expert of the European Bank for Reconstruction and Development in Kazakhstan. Her research interests are related to strategic management, human resources management, sustainability of companies, entrepreneurship, marketing.
ORCHID ID: orcid.org/0000-0001-6892-2392

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THE EFFECT OF ENTREPRENEURIAL CHARACTERISTICS ON THE ENTREPRENEURIAL INTENTION OF UNIVERSITY STUDENTS IN OMAN and SUDAN

Tariq Atiya [1], Zaroug Osman [2]

[1,2] *Department of Management, College of Commerce and Business Administration, Dhofar University, Salalah, Oman*

E-mails:[1] tariqm@du.edu.om; [2] Zosman@du.edu.om

Abstract. This study intends to measure the presence of entrepreneurial characteristics like (Risk- Tolerance, Persistence, Self-confidence) among university students in developing countries. The study also aims to examine the influence of the entrepreneurial characteristics on the intention of these students to involve in entrepreneurial ventures after completing their studies. In addition, the study intends to compare between students in different universities on the level of availability of entrepreneurial characteristics, and the readiness to establish entrepreneurial projects. The study population consists of students of three universities in Oman and Sudan of which the sample consisted of 660 students randomly selected. Out of them 574 questionnaires were found valid for analysis. Following a descriptive approach and using relevant statistical tests the study reached a set of conclusions, the most important of which, shows that the level of the availability of the entrepreneurial characteristics, and entrepreneurial intention among the students of the three universities was found to be high. The results showed a high level of self-confidence and high level of entrepreneurial intention for Dhofar University students compared to students of the Sudan International University and University of Bahri. The results demonstrates that the impact of entrepreneurial characteristics of students on their entrepreneurial intention is statistically significant.
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Keywords: entrepreneurial characteristics; risk tolerance; persistence; self-confidence; entrepreneurial intentions; university; students

1. Introduction

Many studies emphasize the significance of entrepreneurship and entrepreneurial characteristics **(ECs)** as instruments of improving the ability to discover and exploit opportunities in an environment of extreme complexity and rapid change. The characteristics of the individual and personal traits have an impact on ~~his~~ behavior, attitudes and performance (Abu Samrah, 2017).

Perhaps the most prominent of these characteristics are related to entrepreneurship and behaviors that lead individuals in general to determine the strategic directions and entrepreneurial actions that contribute - positively to accelerate the growth of the business sector, which is supposed to be synonymous with the public sector and integrated with it in promoting sustainable development in society. In spite of the importance of entrepreneurial characteristics, it is noticeable after reviewing the relevant literature, that studies on the entrepreneurial characteristics in the Arab business environment are still limited.

In most of the developing countries, the public sector is the main employer of national labor. The continuous increase in the proportion of young people who seek government jobs, led to the failure of the government institutions to create jobs for the growing labor force with the increasing population. For example, a study by NCSIOMAN[*] (2019), reported that 87% of the job seekers prefer government jobs (The Omani youth attitudes towards work, 25). This leads governments to activate the private sector and civil society to take the lead in creating employment opportunities for youth alongside state efforts.

Compared to the rest of the world, the regulatory environment for entrepreneurship in the Oman and Sudan is still found lacking on many fronts. For example, Sudan ranks 162 out of 190 in the World Bank doing business rankings of 2017, whereas the Sultanate of Oman was ranked 78 (World Bank, 2019). On top of that, the Arab region is considered the geographic region in the world having highest unemployment rates ("Comparing unemployment rates in the Arab world between international and government figures", 2020). Therefore, employment of youth is a matter of great concern to all the state agencies in both Sudan and Oman, and efforts are being made to increase employment opportunities for young people in various sectors of the labor force so that they can participate in the development process in these countries. However, the national efforts to empower young people to lead entrepreneurship remain unfulfilled and have not reached the level at which this situation can be addressed.

Having this picture, the, educational institutions (especially the universities) are expected to play a vital role in preparing the students and equipping them with the necessary tools to tackle these problems. Therefore, it is important to create positive attitudes of the youth towards establishing their own projects and to be job creators than being just job seekers.

The success of universities in this matter depends largely on understanding the students who possess the relevant characteristics to involve in establishing their own businesses. This study tries to contribute in this regard, through assessing the level of entrepreneurial characteristics among university students in Sudan and Oman. It also intends to investigate the effect of these entrepreneurial characteristics on their entrepreneurial inclination. Therefore, the main goal of this study is to examine the impact of the entrepreneurial characteristics among undergraduate students in Sudan and Oman on their entrepreneurial intention. It also intends to meet the following goals:
1. Investigate the level of entrepreneurial characteristics (**ECs**) among university students in Oman and Sudan.
2. Investigate influence of these **ECs** on the entrepreneurial intentions (**EIs**) of university students in Sudan and Oman, and identify the most important **ECs** that can forecast the **EI**s of university students in Oman and Sudan.
3. Examine whether there are measurably noteworthy contrasts within the level of ECs and EIs between university students in Oman and Sudan.

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[*] National Centre for Statistics and Information Oman

2. Literature Review

The concept of entrepreneurship

Entrepreneurship is a complex and multidimensional concept because of its different disciplines, such as economics, management, sociology, and others. It is not possible to say that there is a unified agreement among researchers and writers on the definition of entrepreneurship. At the same time, most of these researchers and writers do not differ in returning the concept of entrepreneurship to a French expression "entreprendre" that appeared in the Middle Ages. The functional connotations of this concept have evolved from the meaning of mediation between two parties in the sixteenth century to its contemporary meaning, which includes the completion of works through the enjoyment of specific characteristics (Al-Qahtani, n.d).

Thus, the researchers have differed on the definition of entrepreneurship and its dimensions and each of these researchers looked at it and investigated it according to their area of specialization. Economists - for example - focused on the economic dimension of entrepreneurship, while psychologists and sociologists considered it to be an attribute of a person with the ability to take risk (Ismail, 2010; AL Jabri and Bakhdar, 2019).

The studies and developments continued in the areas of entrepreneurship since the thirties of the twentieth century as a result of the attention of several people, economists and others. One of the most famous of them was Joseph Shumpeter as well as some Austrians economists such as: Carl Menger and Ludwig von Mises and Friedrich von Hayek, who worked on refining the currently used entrepreneurial concepts. (Higher Population Councile HPC, 2018). As for Shumpeter, "the entrepreneur, is the person who is able to invent and create what is successful and new, by transforming ideas with will and determination" (Higher Population Councile HPC, 2018). Thus, through their creative activities entrepreneurial powers create new business models and products in the marketplace, hence helping in long-term economic growth and working on industrial development (Higher Population Councile HPC, 2018).

Below are some of the most notable features of the development of the concept of entrepreneurship, some of which have affected the concept of entrepreneurship up to the present times.
In the period of the 1920s, particularly in 1921, Frank. H. Knight embraced the idea that entrepreneurship depends on the principle of risk. This belief continued until 1967, when another concept prevailed, which is the entrepreneur's ability to apply ideas and their implementation without the adoption of the principle of risk that was brought by Frank Knightn (Alam and Mohiuddin, 2014).
During the 1970s Peter Drucker took the concept back to the idea of relying entrepreneurship on the principle of risk (Eroğlu and Piçak, 2011).

Following the economic difficulties which prevailed in the 1970s, towards the beginning of the 1980s, the idea of entrepreneurship was built around the persons who looked at things in their own way to achieve profits by using ~~by using~~ the right time and effort to seize the available opportunities.

Perhaps the beginning of the nineties witnessed a qualitative development in the entrepreneurial thought and linking it to the environment surrounding the economy and the world of business and economic openness, which affected the world in general. Therefore, the broader definition become that entrepreneurship is to build a creative economic organization in order to make a profit or growth under risk and uncertainty conditions (High Population Council HPC, 2018). Entrepreneurship has been described as the process of launching a business, and providing the necessary resources for it, taking into account the benefits and risks associated with it. The concept was defined also as the process of creating a new business of value through exerting effort, spending capital and allocating time, and taking risks, to obtain the reward. Another definition states that entrepreneurship is the process of finding something different that has value through allocating the time and effort necessary for that,

while preparing to take the material, physical, social and consequential risks (Sultan, 2016). In a nutshell, the concept of entrepreneurship has grown with the development of different countries' perspective of the economic and social objectives they seek to attain. In developing countries, those who take the initiative and take risks, and create a new businesses that is expected to contribute to the objectives of economic and social development as entrepreneurs.

The Entrepreneur

Historically, the entrepreneur concept dates to the middle ages to point at the person who runs big production projects. In the 17th century, the concept was used to describe a person who makes conditional contracts with the government. In the 18th century, a distinction was made between the person who provides capital to others as an investor and the person who needs capital as a entrepreneur to use the capital. In the 19th century, the entrepreneur was known as the person who organizes and manages the project to obtain individual gains using his skills and experiences in the hope that he would achieve gains by operating these sources and exposing him to risks. In the 20th century, the entrepreneur was known as the creative innovator who reorganizes the form of production using a specific invention or a new technological means, or providing an existing ccommodity in an uncommon formy. Worth noting that English speakers know entrepreneurship as the small and new project, and German speakers know it by force and ownership, i.e. the person who owns and runs the project himself (◦Al-Qahtani, n.d)

Richard Cantilon, was the first to use the term entrepreneur in the economic literature (Entrialgo, Fernández, and Vázquez, 2000). According to Cantillon, the entrepreneur is the person who initiates and leads all activities in the market as buyer from producers and seller to consumers. He buys at a specific price and sells at an uncertain price in future, and this reflects the entrepreneurial spirit. Thus, it can be said that the entrepreneur is the initiator of adopting new ideas, the one who seeks to discover and maximize opportunities, who possesses a spirit of risk, clear vision, has the ability to plan and deal with ambiguous circumstances in order to add value or develop products to achieve profit and growth (Entrialgo, Fernández, and Vázquez, 2000). The concept was then broadened to include a person who bears the full risk towards the business that he runs.

Entrepreneurial Characteristics

The entrepreneurial characteristics are the necessary requirements for entrepreneurs in an accelerated business environment at all levels. These characteristics are a number of personal characteristics, including what is inherited, what is acquired and grows during the entrepreneur's career and appears in his behaviors, and becomes part of his personality that cannot be changed in many cases. Regarding entrepreneurial characteristics (Sultan, 2016) reports that the characteristics of an entrepreneur represent a set of knowledge, skills, abilities, and behaviors that a person must possess in order to become an entrepreneur; some are inherited by him and others are acquired by learning and training. In general, the entrepreneurship researchers seek to link entrepreneurial activities with creativity and risk, and the ability to use modern technology and its applications. As noted by Kusmintarti et.al. "These chracterics are a combination of some characteristics that should be owned by an entrepreneur and some psychological attributes that are regarded as predictor of entrepreneurial intention (Anik Kusmintarti, Armanu Thoyib, Khusnul Ashar, and Ghozali Maskie, 2014). More specifically, Al-Balawi described the entrepreneurial characteristics as a set of personal, behavioral, and managerial characteristics related to the entrepreneur that describes the person as entrepreneur and enables him to add value to the product, service, method, and procedures, and to find what is new and special" (Al-Balawi, 2015 as cited in Abu Samrah, 2018).

Yonca Gürol and Nuray Atsan, (2006), distinguished between three sets of factors which influence entrepreneurial behavior, the individual, social and environmental factors. The social factors model examines the personal and family background, while the environmental factors model examines the contextual factors such as value of wealth, tax reduction and indirect benefits. The third set of factors which is an individualist approach, on the other hand, concentrates on characteristics of entrepreneurs. This model assumes that entrepreneurs possess some unique characteristics which distinguish them from others. Many studies have been conducted based on this model.

Various research studies have analyzed entrepreneurial characteristics. There is no agreement among studies on the number or the nature of these characteristics. For instance, Abu Samrah (2018) states that the literature mentions more than 40 characteristics of the entrepreneur. However, the effect of these characteristics was very uneven in studies conducted on many entrepreneurs around the world. AL Hashweh (2012) reviewed (26) studies on the characteristics of entrepreneurs published between the years 2000-2012, and came out with some most frequently used characteristics which included: Risk-taking, decision-making, taking responsibility, self-confidence. Abu Samrah, (2018) reviewed (11) studies and concluded that "the most frequently used characteristics are: innovativeness, initiation, risk-taking propensity, need for achievement, self- confidence, internal locus of control, and independence". On the other hand, Zemmrer and Scarborough, identified the most important entrepreneurial characteristics which include: taking personal responsibility for the results of risk, self-control over resources to achieve specific goals, has confidence in the possibility of success, interested in direct feedback, knowledge of the level of performance, perseverance, has a high level of ambition and has a direction towards the future and has the ability to deal with uncertainty of success (Zemmrer and Scarborough, 2005, cited in Al-Jabri, K. M., and Bakhdar, A. M. 2019) .

In the present study three ECs are used to define the entrepreneurial profile of students. These are risk tolerance, pervasiveness, and self-confidence. These characteristics were chosen since they are frequently cited in different studies in the entrepreneurship literature (Yonca Gürol and Nuray Atsan, (2006). Another reason is that the authors believe that these three characteristics are broad enough to include many other sub-characteristics. In addition, the three characteristics were chosen because the researchers have examined other characteristics in a previous studies.

Risk Tolerance

Entrepreneurial activities usually involve a certain degree of risk. The more the degree of desire to succeed, the more the entrepreneur is inclined to take risk. Therefore, risk tolerance is considered a major characteristic of entrepreneurs and is widely discussed in entrepreneurship literature (Zaman, 2013). Risk tolerance for entrepreneurs reveals the capability to handle uncertainty and the readiness to accept a loss. These are significant and vital skills for effective entrepreneurs (Oosterbeek, Van Praag, and IJsselstein, 2008). The most important thing that an entrepreneur should enjoy is bravery and accepting uncertainty. Ammar (2016) distinguishes between, risk and gambling, explaining that the former is associated with putting the necessary effort and seizing opportunities, while gambling is associated with luck and chance, it is a game of challenge and excitement, and the pleasure of working for success. "Unlike gamblers, entrepreneurs are not high-risk takers; they calculate their risks before taking action and place themselves in situations involving moderate risk" (Ayalew and Zeleke, 2018).

This suggests students who have high risk tolerance may be more willing to start their entrepreneurial activities. Therefore, it can be assumed that:
*Risk tolerance has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.*

Perseverance

Perseverance involves the ability to continue willfully, in spite of setbacks or objections (Oosterbeek, Van Praag, and IJsselstein, 2008, p. 8). It includes being patient, persistent, tenacious, and passion for what he is doing with a strong belief that he can succeed. This characteristic means that the entrepreneur has the desire to work for long hours and to withstand the work pressures. He is someone who does all or more than, what is required of him. That is because of the passion for work which gives him the ability to be patient for the results when they come late, or less than expected, or even if the results are negative he does not give up but tries again and again till the achievement of desired results. This is what is called by Barringer and Irelan, (2016) as the tenacity despite failure. A successful entrepreneur has a high degree of perseverance that makes him believe that he can succeed provided that he does not back down, and learns from his experience and that of other people. Studies show a positive relationship between perseverance and the level of business success (Ammar, 2016).
Nothing is more necessary to achieve success than perseverance because it is about overcoming all obstacles.

Entrepreneurs know they're likely to come across disappointments on the way to success. That is why persistence is regarded as one of the essential characteristics of a competent entrepreneur. Entrepreneurs ought to acknowledge difficulties and indeed be willing to begin from scratch in order to achieve their business goals. Belás and Ključnikov, in their study, concluded that "entrepreneurs consider expertise, responsibility and perseverance to be the most important personal characteristics and skills" (Belás and Ključnikov, 2016). This indicates that students who enjoy perseverance characteristic may be more inclined to establish their own business. Therefore, it can be proposed that:

*Perseverance has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.*

Self-confidence

This characteristic is reflected in the entrepreneur's ability to confront challenges without getting bored and working to tame the difficulties in light of evoking the capabilities and problems. Entrepreneurs not only feel that they can face the challenges, but they seek for challenging and demanding tasks, which require greater confidence. Through self-confidence entrepreneurs make their business successful as they are more sensitive towards different types of problems and have higher ability to arrange these problems and deal with them better than others. Therefore, self-confidence is always cited as an important entrepreneurial characteristic in the entrepreneurial literature, whereas some others regard self-confidence as the key to entrepreneurial success. Ho and Koh (1992) and Ferreira et al., (2012) argued that self-confidence is a required entrepreneurship characteristic and that empirical studies in the entrepreneurial literature have found that entrepreneurs have higher self-confidence than non-entrepreneurs (cited in Garaika, Negara, and Margahana, 2019). On the other hand, "many university students prefer to work as employee in a company or becoming government employee, and only few of them think to create self-employment or become entrepreneur due to lack of confidence" (Herdjiono, Puspa, Maulany, and Aldy, 2017).
Therefore, it can be proposed that: *Self-confidence has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.*

Entrepreneurial Intention (EI)

The issue of intention is significant part of understanding human behavior and provide opportunity for more concentration on forecasting future behaviors instead of only those that describe the behavior. Tendency of people to be self-employed reveals the difference between an individual's awareness of his or her personal aspiration to work for his own, and his or her desire to work for other business institutions. Therefore, the high

tendency to be self-employed shows that an individual tends to work more for his own than for other people (Kolvereid, 1996, as cited in Ramadan, 2012).

There are various definitions and thoughts about EI. Krueger, Reilly and Carsrud, (2000) regraded EI as a strong indicator of individual planned behaviors, especially when this behavior is rare, difficult to control, or unpredictable. Thompson (2009) defines it as a conviction of self-esteem in setting up a new project and planning to do it in the future. Intention of entrepreneurship is also defined as "a state of consciousness that directs the attention, experience, and behavior of people towards entrepreneurial behavior" (Bird, 1988). So entrepreneurial intent shows that individuals are ready to behave in a specific manner. Entrepreneurial intention has been researched from different aspects as it proved to be one of the stronger predictors of entrepreneurial behavior (Indrasari, Purnomo, Syamsudin, and Yunus, 2018). Thus, it can be said that, the degree of the intent of the individual sets the limits for the degree of eagerness and passion which is then manifested in the level of real performance that motivates it towards the success of the project (Atiya, Bilal, Abulhamid, and Shoaib, 2019).

Various models were also developed to explain the entrepreneurial intention. Some of these models have proven to be the best methods that can be used to predict entrepreneurial actions. Two models are specifically important in the context of entrepreneurship. One was developed and well validated in social psychology namely, the Theory of Planned Behavior (**PB**)). The other was proposed, but not well tested from the domain of entrepreneurship research is Shapero's model of the 'Entrepreneurial Event' (Krueger, Reilly, and Carsrud, 2000).

The theory of planned behavior assumes that the root of all behavior is an intention., while the basic idea of Shapero's model of the 'Entrepreneurial Event' is that there is an event in a person's life that changes course of his career. According to Shapero, there are four factors that contribute to raising the EI of the individual, social factors, economic factors, realizing the desire to materialize, and the realization of embodiment. He points out that the entrepreneurial spirit stems from awareness of the feasibility and desire of the person, and this path is affected by the cultural and social context. The entrepreneurial intention is primarily related to taking the initiative, action or transferring to the application. Individuals who enjoy the entrepreneurial intention have the intention to try new things or to do things in a different way (Ayad S. Galoon, G. and Aynoose, R., 2019).

For the purpose of the current study the theory of planned behavior is more relevant. The theory of PB claims that EI is dependent on an individual's perception toward the extent of desirability of an entrepreneurial career, beliefs about others' normative expectations of the individual and the motivation to comply with these expectations, and the amount of control that an individual exercises over his behavior and the strength of his intentions to perform this behavior (Kume, Kume, and Shahini, 2013).

3. Research Problem and Questions

This study attempts to analyze the effect of entrepreneurial characteristics on entrepreneurial intention of university students in Sudan and Oman.
In accordance with the topic of the research, the following questions express the content of the research problem:
- Do students in the Sudanese and Omani Universities possess entrepreneurial characteristics (risk tolerance, perseverance and self-confidence)?
- To what extent do university students in Sudan and Oman enjoy EI?
- Do university students in Oman and Sudan have high level of EI?
- What is the effect of ECs on the EI of university students in Oman and Sudan?

- Are there differences of statistical significance in the opinions of the surveyed university students in Sudan and Oman, regarding the entrepreneurial characteristics and the entrepreneurial intention that can be attributed to the university?

Consistent with this, the research tries to achieve its fundamental objectives which are centered around determining the extent of the impact of the entrepreneurial characteristics of university students in Oman and Sudan, on their intention to be self-employed. The study also aims to examine whether there are measurably noteworthy contrasts within the level of ECs and EIs between university students in Sudan and Oman.

The study derives its academic significance as it may contribute to bridging the knowledge gap of studies and research related to this topic when it becomes clear the scarcity and modernity of the studies that dealt with it according to the researcher's knowledge in the Sudanese and Omani libraries. Likewise, what the study offers in terms of intellectual and theoretical enrichment regarding the entrepreneurial characteristics, the entrepreneurial intention to local library, and clarifying the nature of the relationship between the two variables among university students in Oman and Sudan. Another peculiar significance of the study is that it empirically explores the attitudes of university students in Oman and Sudan and makes some comparison between them.

4. Hypothesis Development

In light of reviewing of literature on entrepreneurial characteristics and intention, the conclusions reached, the study questions, in addition to the objective to be accomplished, a number of hypotheses can be formulated for the present study as follows:

H1: There is statistically significant correlation between **entrepreneurial characteristics** (risk tolerance, Perseverance, and Self-confidence) of university students in Sudan and Oman and their **entrepreneurial intention**

H2. **The entrepreneurial characteristics** (risk tolerance, Perseverance, and Self-confidence) have effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman

H1a: **Risk tolerance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman

H1b. **Perseverance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman

H1c. **Self-confidence** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman

H3. There are no differences of statistically significance in opinions of the surveyed university students in Oman and Sudan that can be related to the university.

There are no differences of statistically significance in opinions of the surveyed university students in Sudan and Oman that can be attributed to the university.

5. Methodology

The study followed the descriptive approach through which it is possible to collect data and information necessary to develop the theoretical framework and conduct a field survey to collect data and information about the dimensions of the study through the questionnaire prepared by the researcher, and to analyze these data and information based on descriptive statistics methods of the dimensions of the research tool and its statements according to the requirements of the research question to achieve the research goals.

The study population consists of students of three universities in Oman and Sudan. Namely Sudan International University with a total number of students of 12,450, University of Bahri (Sudan) with a total number of students

of 23,000 and Dhofar University (Oman) with a total number of 5,100 students. This makes the total study population 36,100 students. The study sample consisted of 660 male and female students. The study participants were randomly selected from these three universities. They were informed of the purpose of the survey, and were also ensured of the privacy and secrecy of their responses. Thus, 660 questionnaires were distributed and 574 questionnaires were retrieved valid for analysis.

In order to achieve the goals of the study, the researchers have developed a questionnaire to collect the necessary data, related to the concept of ECs among university students and their intention to start their own business. The questionnaire consisted of the following sections:

Section one: General information.

Section two: This section represented the independent variables of entrepreneurial characteristics. The statements of this section were based on the study of Muhamad, (2014), Sultan (2016), and Abdulfatth, (2016).

The questionnaire used five point Likert scale (1=Strongly Disagree,1=Disagree, 3=Netural, 4=Agree, 5=Strongly agree).

Section three: this section represents the dependent variable entrepreneurial intention. The statements of this section were based on the study of Zaidan (2011), Karimi, et. al. (2012), Ramadan (2012), Sultan (2016), and Sacral, H. C. (2017).

After developing the questionnaire, it was presented to a number of expert professors for review and evaluation. Their remarks and recommendation for amendments, addition or deletion were taken in to consideration. The reliability of the study tool was then tested using Cronbach's α coefficient which was satisfactorily at 0.886.

The table 1 below shows profiles of the sample of respondents

Table 1: Demographic Information

Variable	Category	Number	Percentage
University	Dhofar University (DU)	127	22.1%
	Sudan International University (SIU)	224	39.0%
	University of Bahri (UoB)	223	38.9%
	Total	**574**	**100%**
Age	20 yrs or less	100	17.4%
	More than 20 – 25 yrs	422	73.5%
	More than 25 – 30 yrs	34	5.9%
	More than 30 yrs	18	3.1%
	Total	**574**	**100%**
Gender	Male	257	44.8%
	Female	317	55.2%
	Total	**574**	**100**

Table 1 shows that the 39 percent of the respondents was from from SIU, followed by 38.9 percent from UoB, and 22.1 percent from DU. The table also shows that the percentage of female respondents was 55.2%, whereas the percentage of males in the sample was 44.8%. This is in line with current trends of growing number of female students in higher education institutions.

More than 73.5% of the respondents were within the age group of, (more than 20 - 25 years) whereas the age group of (20 years or less) represented 17.4 percent. The category (more than 25 years) represented 9 percent. The information from the table clearly shows that the respondents can understand and address the questionnaire accurately.

Within this study, the internal consistency of the research instrument was evaluated using Cronbach's α coefficient. The outcome of the reliability test showed that the study instrument with the α coefficient of 0.886 of a Cronbach, is reasonably reliable.

6. Analysis of the Study Questions

In this section of the research, the authors evaluated the respondent's answers to the basic research questions as follows:

Question One: Do students in the Sudanese and Omani Universities possess entrepreneurial characteristics (risk tolerance, perseverance and self-confidence)?

Question Two: To what extent do university students in Sudan and Oman enjoy the entrepreneurial intention?

Table 2 presents the arithmetical mean, the standard deviations, and the level of agreement:

Table 2: Means and standard deviations of the Study variables

Variable	Mean	Standard Deviation	The level of Agreement
Risk tolerance	3.99	1.066	High
Perseverance	4.32	0.908	Very High
Self-confidence	4.10	0.85	High
Entrepreneurial Intention	4.04	1.033	High

Table 2 demonstrates that the surveyed respondents enjoy high level of the three entrepreneurial characteristics. The arithmetic mean of the three characteristics collectively is 4.13 which is rated as high level. This indicates that respondents have entrepreneurial characteristics. Perseverance was the highest characteristic with a mean of 4.32 followed by self-confidence with an average mean of 4.10 and then, risk tolerance with an average mean of 3.99, while the entrepreneurial intention showed a mean of 4.04. This indicates that students are willing to involve in business activities and are ready to put whatever effort that may be required, but they are somehow very calculative regarding risk.

Hypotheses Testing

In the light of the reviewing the descriptive statistics for the study variables, and the conclusions reached, the first group of the present study hypotheses can be tested as follows:

H1: First Main Hypothesis: This hypothesis states that *there is statistically significant correlation between entrepreneurial characteristics (risk tolerance, Perseverance, and Self-confidence) of university students in Oman and Sudan and their entrepreneurial intention*

To test this hypothesis, the Pearson correlation coefficient was used as follows:

Table 3: Pearson correlation coefficient of the relationship between ECs and EI

Entrepreneurial Characteristics	Entrepreneurial Intention	
	Correlation Coefficient	Significance
Risk Tolerance	0.519**	0.000
Perseverance	0.521**	0.000
Self-Confidence	0.577**	0.000

The results of Table No. (3) shows that Pearson's correlation coefficients for the relationship between each entrepreneurial characteristic and entrepreneurial intention is (0.519) for the risk-tolerance characteristic, and (0.521) for the perseverance characteristic, and (0.577) for the self-confidence characteristic. The statistical significance level accompanying this was (0.000), which is less than the level of significant significance (0.01). Based on this result, we can say that there are direct and statistically significant correlation relationships between entrepreneurial characteristics (risk tolerance, Perseverance, and Self-confidence) of university students in Sudan

and Oman, and their entrepreneurial intention. This is evidenced by the association of the entrepreneurial characteristics that students possess in researched universities with their EI. In other words, the possession of the researched students of the entrepreneurial characteristics represented by risk tolerance, perseverance, and self-confidence, reinforce their entrepreneurial intentions. The above provides an indication for the acceptance of the first main research hypothesis

H2: Second Main Hypothesis: *The entrepreneurial characteristics (risk tolerance, Perseverance, and Self-confidence) have effect of statistical significance on the **EI** of university students in Sudan and Oman.* The following are the three sub hypotheses extracted from the second main hypothesis:

> H2a: ***Risk tolerance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman*
>
> *H2b. **Perseverance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman*
>
> *H2c. **Perseverance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman*

In order to complete the analysis the authors tested the effect of the relationship between the ECs (combined and individually) and EIs of university students in Sudan and Oman, using multiple regression analysis where all variables were introduced at once into the regression model, as follows:

Table 4: Model Summary

Correlation	Coefficient of determination R^2	Adjusted Coefficient of determination	Standard Error
0.653	0.427	0.424	0.48980

Table 4 shows that a correlation coefficient of 0.653 exists between the entrepreneurial characteristics and the entrepreneurial intention, which demonstrates a positive correlation between them. This means understanding and identifying those who have these ECs is an important matter to understand and expect the EI. The adjusted coefficient of determination of (0.424) shows that all ECs (combined) interpret (43%) of the change in the EI of university students in Sudan and Oman. This means that a change in the ECs by one unit results in a change in the EI of university students in Sudan and Oman, by 0.43.

Table 5: ANOVA

	Sum of squares	Df.	Mean Squares	F	Sig
Regression	101.897	3	33.966		
Residual	136.744	570	0.240	117.419	0.000
Total	238.640	573			

The outcomes of Table 5 explain that the value of (F) for the regression was (117.419) and the corresponding statistical significance is (.000) which is less than the statistical significance level (0.01). In view of this result, it very well may be said that the inclination of the entrepreneurial characteristics on the entrepreneurial intention is statistically significant at a level below (0.01). This implies that there is a statistically significant impact at (0.01) level of at least one of the three entrepreneurial characteristics on the entrepreneurial intention. In other words, the entrepreneurial intention of university students surveyed can be predicted through some or all of the entrepreneurial characteristics. From the results of the above analysis, it is evident that the students' adoption and ownership of the characteristics expressing the entrepreneurship represented in risk tolerance, perseverance, and self-confidence contribute to the entrepreneurial intention. That is, the entrepreneurial intention of students to go into self-employment depends to a large extent on the level of availability of the ECs of these students in the researched universities.

Table 6: Correlation Coefficient of the variables

Source of Variation	Regression coefficient	Beta	T	Sig
Constant	0.838		5.301	0.000
Risk Tolerance	0.214	0.235	5.853	0.000
Perseverance	0.187	0.189	4.506	0.000
Self-Confidence	0.376	0.358	9.140	0.000

To test the individual sub-effects of each entrepreneurial characteristic on the entrepreneurial intention in the researched universities, the data of the Table 6 shows to the existence of effects on the individual level of each characteristic on in the entrepreneurial intention.

The self –confidence characteristic had the highest contribution of influence, as it explained 38% of the total differences in the entrepreneurial intention supported by a corresponding statistical significance of (.000), which is lower than the Sig. level of (0.01). This means that the entrepreneurial intention of the surveyed university students can be enhanced whenever they enjoy the self –confidence characteristic. In other words, the entrepreneurial intention of the surveyed university students depends largely on having a level of self-confidence. The risk-tolerance characteristic came in second place in terms of influencing the entrepreneurial intention of the surveyed university students, as it explained 0.21 of the total differences in entrepreneurial intention, supported by a corresponding statistical significance of (.000), which is lower than the Sig. level of (0.01). This means that having the risk-tolerance characteristic and adopting it as behavior by the surveyed students will contribute in their tendency to involve in business related work.

Finally, the perseverance characteristic contributed in the EI of the students in the surveyed universities, as it explained 0.19 of the total differences in the entrepreneurial intention supported by a corresponding statistical significance of (.000), which is lower than the Sig. level of (0.01). This means that having the perseverance characteristic and adopting it as behavior by the surveyed students will contribute in enhancing their entrepreneurial intention. That is to say, entrepreneurial intention of the university students surveyed derives its requirements from the perseverance characteristic possessed by those students.

Depending on the results of the regression analysis, which confirmed the existence of a significant effect of the entrepreneurial characteristics, risk tolerance, perseverance, and self-confidence (combined and separated) on the EI of the surveyed university students, the second main hypothesis with its sub-hypothesis is accepted.

H3: Third Main Hypothesis: There are no differences of statistically significance in opinions of the surveyed university students in Sudan and Oman that can be attributed to the university.
To test for differences in entrepreneurial characteristics and entrepreneurial intention ANOVA has been used and the results are as follows:

The results of Table 7 show the analysis of the differences between the three universities (University of Bahri (UoB), Sudan International University (SIU) and Dhofar University (DU)) towards the entrepreneurial characteristics and entrepreneurial intention. The statistical significance associated with the value of F in the variables of risk tolerance, self-confidence and entrepreneurial intention, was lower than (0.05) which shows that there are statistically significant differences in the views of respondents from the three universities towards these two variables.

Table 7: Results of ANOVA test for entrepreneurial characteristics and entrepreneurial intention according to universities

Dimension	Source of variation	Sum of squares	Df.	Mean Squares	F	Sig.
Risk Tolerance	Between groups	4.776	2	2.388	4.807	.009
	intra group	283.627	571	.497		
	Total	288.403	573			
Perseverance	Between groups	.192	2	.096	.225	.799
	intra group	243.983	571	.427		
	Total	244.175	573			
Self-confidence	Between groups	7.237	2	3.618	9.879	.000
	intra group	209.144	571	.366		
	Total	216.381	573			
Entrepreneurial Intention	Between groups	4.302	2	2.151	5.242	.006
	intra group	234.338	571	.410		
	Total	238.640	573			

To determine the direction of the differences arising in the above test in the variables of risk tolerance, self-confidence and entrepreneurial intention, Tukey's pairwise comparisons test was used as follows (Table 8):

Table 8: Results of the Tukey's test for differences between universities regarding the variable of risk tolerance

University	University	Mean Difference	Sig.
DU	SIU	-.02198	.957
	UoB	.17235	.072
SIU	UoB	.19432*	.010

Table 8, shows the results of the Tukey pairwise comparison test for the differences between the three universities towards the risk tolerance variable at the level of significance (0.05). The result showsed differences between the views of students of SIU, compared to views of students of UoB. It is observed that students of SIU have higher risk tolerance than that of UoB students. This interesting result may be due to the fact that, while SIU is private university UoB is a public university. So, the differences may be due to organizational culture (entrepreneurial orientation) between private and public universities (Table 9).

Table 9: Results of the Tukey's test for differences between universities regarding the variable of Self-confidence

University	University	Mean Difference	Sig.
DU	SIU	.29497*	.000
	UoB	.22509*	.003
SIU	UoB	-.06988	.441

Table 9 shows the results of the Tukey's pairwise comparisons to know the differences between the three universities towards the variable of self-confidence at the level of significance (0.05). Dhofar University is better than the students of Sudan International and Bahri Universities. This may indicate self-confidence is higher for students of DU than students of SIU and UoB (Table 10).

Table 10: Results of the Tukey test for differences between universities regarding the variable of entrepreneurial intention

University	University	Mean Difference	Sig.
DU	SIU	0.12436	0.189
	UoB	0.22889*	0.004
SIU	UoB	0.10453	0.197

Table 10 presents the results of the Tukey's pairwise comparison test for the differences between the three universities towards the entrepreneurial intention variable at the level of significance (0.05). The result shows differences between the views of students of DU, compared to views of students SIU and UoB. It can be said that the entrepreneurial intention among students of DU is stronger than that of SIU and UoB students. This may be attributed to some entrepreneurial environment in DU and Oman in general. The following table summarizes the acceptance or rejection of the hypotheses tested (Table 11).

Table 11: Hypotheses' Acceptances or Rejections

Hypothesis Statement	Status
H1. There is statistically significant correlation between **entrepreneurial characteristics** (risk tolerance, Perseverance, and Self-confidence) of university students in Sudan and Oman and their **entrepreneurial intention**	Accepted
H2. **The entrepreneurial characteristics** (risk tolerance, Perseverance, and Self-confidence) have effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.	Accepted
H2a: **Risk tolerance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman	Accepted
H1b. **Perseverance** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.	Accepted
H1c. **Self-confidence** has effect of statistical significance on the **entrepreneurial intention** of university students in Sudan and Oman.	Accepted
H3. There are no differences of statistically significance in opinions of the surveyed university students in Sudan and Oman, regarding the **entrepreneurial characteristics and** the **entrepreneurial intention,** that can be attributed to **the university.**	Rejected

Conclusions

Based on what is presented in the previous pages the following conclusions can be drawn.
The study represents a special importance that it responds to national priorities in Sudan and Oman in the search for ways to empower and encourage young people and provide a suitable environment to launch their own projects through better utilization of their energies and skills in entrepreneurial projects. Specially, that both Sudan and Oman have witnessed during the last decade, unprecedented interest in the concept of entrepreneurship, and this interest has been at the highest levels. Also, the study helps in trying to identify the entrepreneurial characteristics of student who are on their way to the labour market.

The findings of the study show that the level of the availability of the ECs, among students of the three universities was found to be high, with an average mean of 4.11. This result indicates that university students in Oman and Sudan possess the entrepreneurial characteristics that may be necessary to start their own business.
Regarding the level of risk tolerance, the students in the three universities showed high level of risk tolerance, and the students of Sudan International University enjoyed a higher level than the students of University of Bahri.
With regard to perseverance, the students three in universities showed very high level and there was no clear and significant difference between the responses of students in the three universities.

Self-confidence as an entrepreneurial characteristic was at a high level among the students of the researched universities, and it was higher among Dhofar University students compared to the students of the Sudan International University and the University of Bahri.

As for the entrepreneurial intention, the results of the analysis showed a high level among the three university students towards entrepreneurship, and Dhofar University students enjoyed a higher level in the entrepreneurial intention than the students of the international universities of Sudan and Bahri
The results of the study display that there is a positive relationship of statistical significance between the three entrepreneurial characteristics, (risk tolerance, perseverance, and self-confidence), and their EIs. This simply

means that as level of availability of the entrepreneurial characteristics increase, the entrepreneurial intention will also go up. This is particularly important in view of the fact that the intention to involve in entrepreneurial activity precedes the actual conduct of that activity.

The results of the study reveal that there is an effect of statistical significance of entrepreneurial characteristics of students on their entrepreneurial intention. Our results indicate that self-confidence, risk tolerance and perseverance have significant effect on students' EIs. Additionally, the results showed that a student's perseverance had a greater effect on their EIs than that of the self-confidence and risk tolerance. This increases the possibility of students engaging in self-employment activities and entrepreneurial work if the necessary requirements of entrepreneurial work are available (Atiya, Bilal, Abulhamid, and Shoaib, 2019, p. 82).

Implications of the study

This study responds to national priorities in Sudan and Oman in the search for ways to empower and encourage young people and provide a suitable environment to launch their projects through better utilization of their energies and skills in entrepreneurial projects. Specially, that both Sudan and Oman have witnessed during the last decade, unprecedented interest in the concept of entrepreneurship, and this interest has been at the highest levels. Also, the study helps in trying to identify trends among youths who are on their way to the labour market.

The results of this study can help decision-makers to design and develop appropriate policies and interventions to support and encourage the development of entrepreneurship in Sudan and Oman, especially among the university students who are about to enter the labor market. This is more realistic in view of the fact that the willingness to involve in business precedes the actual conduct of that activity.

The study revealed the important role of entrepreneurial characteristics as traits that can help in forecasting the entrepreneurial inclination of university students. As a result, officials in the higher educational institutions should be able to notice attributes of their student's that can indicate readiness to be engaged in entrepreneurial activities. Universities can play a vital role, through changing the situational variables towards entrepreneurship, or the student's self-confidence to start their own businesses. More attention should be paid to training and education because of their importance in encouraging students to start small private projects as it may contribute to reducing the burden on the government to secure jobs for graduates. All which may contribute to reducing unemployment rates among young university graduates.

Originality/value

The paper demonstrates one of the few attempts to examine the effects of entrepreneurial characteristics of university students on their entrepreneurial intentions in two Arab countries. Specifically, we reconfirm students' perseverance as a more important predictor of their entrepreneurial intentions than the self-confidence and risk tolerance in the Sudanese and Omani university context. Additionally, by also demonstrating concept development support as a significant predictor of entrepreneurial intentions, we provide new insights into how universities in Arab countries can foster the entrepreneurial intentions of their students. This result adds to the academic literature on entrepreneurial intentions in Arab world.

Limitations and Future Research Directions

The findings of this research have to be seen in light of some limitations. The first limitation arises from the budget and time constraint for collecting data from three universities in two different countries. This has limited the sample size. A second limitation arises from the nature of measuring entrepreneurial intentions of students. Even students who have demonstrated a high level of entrepreneurial characteristics or intention may not engage

in entrepreneurial activities after graduation. This possibility calls for further research to find out whether those students transformed their intention in to real entrepreneurial projects. Therefore, it is important for future research to go beyond examining entrepreneurial intent, but to continue examining whether intentions lead to entrepreneurial entry and entrepreneurial success. Another main limitation lies with small number of universities in Sudan and Oman, and the fewer numbers of characteristics that were examined. Moreover, the research culture is not very much established in these countries. So there is a lot of resistance by the respondents to provide their responses. So data was collected from the universities whose students were accessible and willing to participate in this research. Further researches can readdress these issues with larger number of universities, participants and entrepreneurial characteristics. Generally, researchers as well as decision makers should be careful to make generalizations of the data gathered. Nevertheless, the article provided some areas for future studies that could contribute in mitigating the gaps between existing and prospective investigations on the entrepreneurial characteristics and intention in Sudan and Oman.

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Dr. Tariq ATIYA
ORCID ID: https://orcid.org/0000-0001-6433-3494

Dr. Zaroug OSMAN
ORCID ID: https://orcid.org/0000-0002-5642-6305

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THE COMPLEX RELATIONSHIP BETWEEN ENTREPRENEURSHIP AND ITS CONTEXT

Fernando Fierro [1], Juan Manuel Andrade [2]

[1]Universidad Surcolombiana, Facultad de Economía y Administración, Colombia
[2]Corporación Universitaria Minuto de Dios - Uniminuto, Facultad de Ciencias Empresariales, Colombia

E-mails:[1] Fernando.fierro@usco.edu.co; [2] Jandradenav@uniminuto.edu.co

Abstract. This article aims to demonstrate a broad and complex relationship between entrepreneurship, including the entrepreneur, with the regional and organizational context in which it operates, for which a theoretical review of the context and entrepreneurial competencies was addressed. In this regard, a qualitative research was carried out with the phenomenological method that allowed an exhaustive review of the most relevant literature, books, and articles on the phenomenon. As a result, different theoretical proposals were analyzed, ranging from absolute relevance to the topic to those that highlight contextual elements such as education. Thus, the importance of the regional and organizational context, the behavior and competencies of the individual, the education of the individual, among other aspects of interest, were addressed.

Keywords: Phenomenology; culture; environment; personality; competence; education

1. Introduction

There are countries that have developed more than others, even on the same continent, indeed, states within the same country, which have differentiated (Acemoglu and Roinson, 2009). The concern that arises is directly related to the factors that condition this development. Thus, several studies by various authors have attributed this event to different aspects such as geographic location (Diamond, 1998), culture (Weber, 2002) or people (Yunis, 2009), among others; However, there is a common factor in which they converge, which is the human being as an entrepreneur. In this sense, Meyer (2007); Su, Xie and Wang (2015) have called for more attention to be paid to the importance of contextual variables in the entrepreneurship phenomenon, even considering unethical phenomena present in the environment that contribute to entrepreneurship (Baron et al. 2018). Yin et al. (2021) carried out a study in China, specifically on returnees who developed business ventures and initiatives, discovering that the initiatives are strongly linked, on the one hand, to the individual attributes of the people and,

on the other, to the characteristics of the context regional, especially to phenomena such as regional prosperity, government fiscal spending, tax burden, natural phenomena (climate) and transportation infrastructure. Despite the fact that there is an important variety of studies that have addressed the issue, it is pertinent to have consensus on the definition and scope of the context and its key variables, from where the phenomenon of entrepreneurship and entrepreneurship in various regions must be understood (Huang, Liu and Li, 2020; Welter, 2011).

Although relevant, it has not been possible to characterize this issue within a framework that would allow to delimit, in academic terms, the creation of companies. This has led many researchers in this area to focus on the study of more dynamic variables and models that take into account personal and social aspects, as well as the interaction between the two, in order to explain and predict entrepreneurial behavior (Trachev and Kolvereid, 1999; Audet, 2002; Crant, 1996; Douglas and Shepherd, 2002; Krueger, Reilly and Carsrud, 2000).

As is known, entrepreneurs must first face different scenarios in their business building process, as stated by Fayole and Bruyat (2002), who point out that economists have tended to approach the issue considering the functionality of the phenomenon, centered on the entrepreneur's role ("what"); human sciences have placed emphasis on personal aspects ("who" and "why"), while management and organizational sciences have focused on the process ("how"). This study thus addresses the matter considering culture from a phenomenological perspective as well as human sciences, which focus their importance on "who" and "why".

In summary, the objective of this article is to present a broad overview of the environmental conditions that promote entrepreneurship and the competencies of the individual who manage them, which are harmoniously combined for the generation of the company (see figure 1). Thus, to develop the objective, the theoretical reflection review based on the literature review is approached in seven parts: 1) The phenomenology of the entrepreneur; 2) The environment and regional context; 3) The internal locus of control; 4) Competencies of the individual; 5) Business strategy; 6) The individual and the organization; and 7) Education and entrepreneurship.
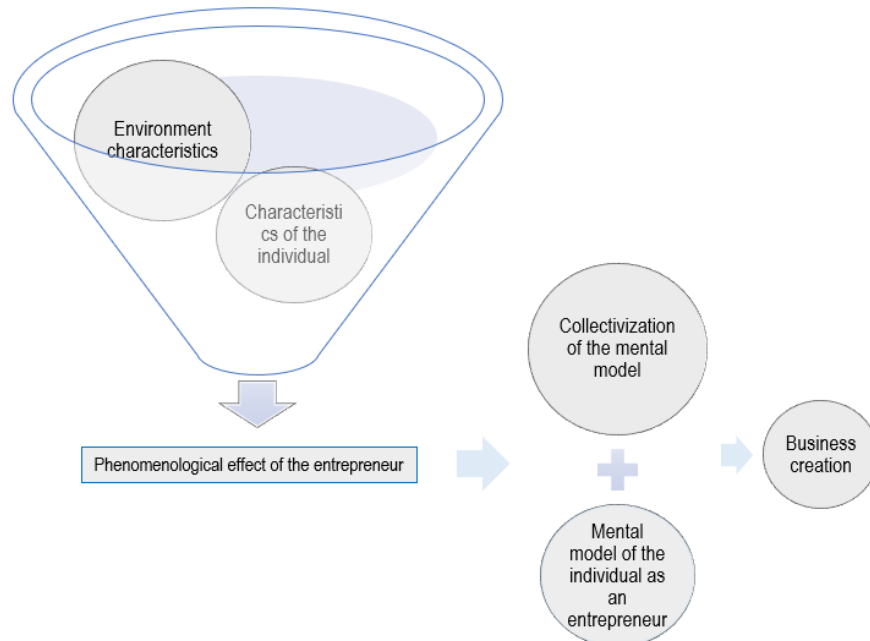
Figure 1. Entrepreneurial configuration process from phenomenology
Source: Own elaboration

2. Metodology

The methodology is presented in three subsections: the first describes the nature, type and cut of the investigation; the second section describes the information collection instrument; and in the third they detail the investigation procedure.

2.1 Research method and type

The present study is of a qualitative nature since it emphasizes the importance of the context, the function and the meaning of human acts (Martínez, 2000), in that order in this study it is intended to describe the entrepreneurial phenomenon based on the conditions of the environment and the competences and behaviors of the subject, within the framework of the phenomenological method. Thus, the phenomenological method is based on the study of the lived experiences of the subject regarding an event, in this case the entrepreneur facing the phenomenon of entrepreneurship. This method is used to analyze complex phenomena in human life that can hardly be understood from rigid schematic frameworks. Indeed, phenomenology seeks to understand social facts, for which it is a priority to conceive of realities as a dynamic of factors and actors that make up an organized, interacting and systemic totality, whose study and understanding requires the capture of that internal dynamic structure that defines it (Fuster, 2019).

2.2 Instruments

In this research, the data record sheet applied to books and articles, of high impact in the literature of the entrepreneurial phenomenon, on the categories of interest was used as an instrument for collecting information; This instrument allowed the registration and identification of information sources, as well as the collection of data or evidence. In the reading cards, the data of the document are recorded and then the different sections are broken down linearly, oriented towards a comprehensive and critical reading of the text. Indeed, they usually contain very specific guidelines that often seek to interrogate the text from certain topics (Martos, 2008).

2.3 Procedures

Initially, the study problem was detected to define the objectives that would allow solving said problem. Theories to support the study were then selected based on the category of study.

3. Result and Discussion

3.1 Reality and phenomenology of the entrepreneur

To analyze culture as a process within a society and the men who compose it, it is important to acknowledge that, from a philosophical point of view, expressed in the terms of Husserl, phenomenology aims to explain the correlation between people, their reality and the world of things. In other words, the structure of human experience is what has been called phenomenology (Herrera, 1998). For phenomenology, culture is the set of productions that result from the continuous activities of men as a collective, whose permanent spiritual existence lies in the consciousness of the community and which is preserved by tradition (Holes and Vargas, 1996). This notion makes it easier to understand the interaction of society and the individual in the construction of the cultural context. This leads to determine that the set of productions that emanate from the correlation between people and reality create new parameters in different societies (Yunis, 2009). Thus, each region —according to the characteristics of its foundation, of those who founded it or how they further developed— creates different cultures (realities) that establish the best way to deal with different situations because their group of individuals is aware of contexts which the vast majority of people in a certain society are familiarized with.

When analyzing the phenomenon of entrepreneurship within a regional reality, entrepreneurs are a transversal factor which creates culture, the latter which at the same time constitutes an important variable (Orrego, 2009),

both for the development of the individual and societies. However, a single person's response to development is not enough. Willpower communities must be built, made up of certain people who have common desires (Husserl, 1987). This way, the influence of a person can be reflected in others and it can make it easier to permeate the subject in all their expressions.

Finding common grounds between individuals in a society can unify ways of thinking that reflect its beliefs. According to Herrera (1998), humans are cultural beings who experience the social world in terms of motivations; accordingly, they behave in a certain way, they adjust to values and, especially, they seek meaning; in turn, they feel determined by positive or negative valuations and are influenced by their fellows.

The previous parameters can allow to determine that each society creates its own concept of "individual" and its own characteristics (in this case of the entrepreneur), which is strengthened in each person's mental scheme (Senge, 2005). Husserl (1987) states that human beings must commit themselves to shaping a truly human culture. Thus, communal values are developed for a specific society.

However, this culture or its development result in the definition of the subject as an entrepreneur. It is influenced by the understanding of the reality that everyone has, according to this concept. Herrera (1998) considers that, through experience, reality acquires meaning, and this reality is constructed through knowledge acquired over time. This indicates that each department or State in the country has different growth experiences that, unconsciously, lead to the best way to develop their region according to their own and inherent characteristics or, as in the case of tourism, comparative advantages (natural or human) make the area cultivate its own well-being.
To complement each individual's reality, Schutz (2003) states that subjects understand their reality and their common sense, as long as they are part of a particular world, in which there are similar objects and others, where culture and society influence concepts as well as points of view.

When defining the term "reality", Schutz (2003) must make reference to the importance of the subject: a social thing cannot be understood without reducing it to the human activity that created it or without referring to the human activity that drives it. The subject is, thus, a vital part of every society who creates their own definition of the entrepreneur according to their experience and the sum of the experiences of an entire community. Thus, each region is different, having the same need (the development of the entrepreneur), which requires approaching entrepreneurship education in different ways.

3.2 The environment and its regional context
Once the reality immersed in a culture that identifies the individuals of a collective is created, the regional context is originated. In fact, territories are developed from unique contexts defined by an industrial, historical, and local configuration, as well as by the pattern of investment in resources that is made over time (Auerswald and Branscomb, 2003).

In particular, it allows to explain the advantages possessed, which are specific to a territory and have to do with both the possession and the ability to acquire or develop a set of resources that competitors or rival areas do not possess (Barney, 1991; Wernerfelt, 1984). Just as each person improves their position, each region must improve their environment. The environment itself contains and, at the same time, supports business activity (Neck et al., 2004).

The development of different contexts for each region, according to its evolution, creates tangible and intangible assets of its own that no other region has and that condition the creation of companies, and provide the basis that allows, from a dynamic perspective, to differentiate those territories that have a differential degree of success in stimulating the company development (West, Bamford and Marsden, 2008). And, due to the diversity of resources

(Barney, 1991) that the country's departments possess, each of them can develop various forms of entrepreneurship.

The environment includes a set of variables that generate opportunities and threats for entrepreneurship activities. Kantis defines it as the entrepreneurial development system, which is composed by social and economic conditions, cultural aspects and the educational system, the dynamic and productive structure, the factor markets, the networks —social, productive and institutional—, personal aspects and political regulations. Each of the factors mentioned are developed at different scales, in different areas, indicating that the emphasis must be different and not general for the territories in each of them.

Zahra and Wright (2011) and Zahra et al. (2014) have proposed one of the most complete and comprehensive models on the understanding and composition of the contextual environment that exists in the literature. Thus, the authors' model includes the dimensions: temporal, industrial and market, spatial, social and organizational, property and governance of the context.

However, it is important to highlight that, due to the cultural diversity of the country, each region can improve or change its reality (culture) to develop a competitive advantage of the company based on the combination and use of the resources available to it. or it can develop (Audretsch et al., 2018; Foss et al., 2007). Although it is important to mention that the resources are systemic and can be durable over time (West and Bamford, 2005; West, Bamford and Marsden, 2008). Increased or decreased by the specific resources that a territory possesses, its natural resources (for example, its climate), such as resources created by the community, whether of generalized use (roads) or specialized (specific research institutes) (Porter, 1991).

The appropriate combination of advanced and specialized resources of nature, mainly intangible, the correct mobilization of these through the establishment of multiple interactions and the difficulty of their acquisition, imitation and replacement, justify the failure of certain initiatives to develop entrepreneurial ecosystems, including although they have studied the structure and set of resources of a model area (Spigel, 2017; West and Bamford, 2005). Each area must educate its potential entrepreneurs according to its limitations and not doing it as a general rule, in this way the failure of entrepreneurship attempts is reduced, as in the case of China and the coastal and inland cities (Yingying and Olivares, 2012).

Regarding the idea of Neck et al. (2004) about the necessary temporal evolution of certain components that interact to form a dynamic system that fuels the creation of companies, each region or country must, from its current combination of resources and long-term established goals, trace its path in order to acquire new resources that complement existing ones and that are especially attractive for the system, which allows the gradual development of its entrepreneurial environment supported by idiosyncratic property advantages (West, Bamford and Marsden, 2008).

The purpose of having efficient variables that allow permeating all sectors of the economy is that individuals in a territory increase their opportunities to develop productive processes that generate employment and wealth, thus improving their quality of life, and that they project themselves as generators of added value to all the processes that are part of the economic and social functioning of the community (Sen, 1998).

Each region is a dynamic social context which acts according to the variations of time and resources derived from the area, which leads to the change of mentality or formation of the individual's personality within their own reality. According to Mucchielli (1985), mentality can be defined as a society or social group's implicit reference system, homogeneous from the point of view of the common spirit. It is a frame of reference that allows people to perceive and interpret reality in a certain way and, therefore, see the reactions and behaviors according to that

perception of the world, or of their area, placing the need to change personalities through focused education to the realities of each territory.

Aspects regarding social reality, the human problem, according to geographical location, are set aside. As stated by Hoyos and Vargas (1996), the objective is to save the phenomena, and showing the world intended experiences. In this case, it is to justify the human dimensions related to the transforming mentality and to the ability to generate new ideas, which allows to deduce the relationship with the conviction that is acquired and built, and that is associated with the strengthening of the will.

Finally, there are many approaches that propose alternatives for regional development such as industrial districts, business clusters, innovation systems and business ecosystems, among others. However, from the previous approaches, business ecosystems have received broad support from the academic community due to the articulation of their components such as policies, actors and supporting institutions (Acs et al., 2017; Malecki, 2018).

3.3 The reality of the internal locus of control

Considering the person and their behavior, and in order to understand the process of how reality affects the personality and generates traits, the concept of locus of control is used. Locus of control leads the perception that a person has about the source of their destiny (Robbins, 1999). That is, a person is defined in their way of thinking and will be sentenced to act and have mental schemes according to where they are born and developed (Senge, 2005), which make them believe that they are conditioned by the particular way that entrepreneurs are made in that specific region.

Ong and Hishamuddin (2008) state that the internal locus of control is defined as the belief that a person has about results through the ability, effort or skills that they have, and not so much about other people's actions. Each individual owns their decisions and their own result: these people consciously assume (Popper, 1972) that they are building their own world and that this world is the best for them, since it is the one, they know. However, these decisions are influenced by the opportunities offered by their environment. In this way, everyone develops skills according to their geographical area.

On the other hand, Miller and Toulouse (1986) mention that a person with internal locus of control believes that the consequences of their behavior come from their own efforts, and a person with external locus of control considers that their life events depend on factors that are out of their control, and are attributable to chance or destiny. External factors are the realities or the culture that surround individuals for the development of their potential as entrepreneurs. Individuals can be influenced through education, for the strengthening of the locus, oriented towards entrepreneurship with the limitations that the environment offers.

Individuals, consciously or unconsciously (Popper, 1972), create psychological traits that characterize their region or the other way around. One of the main factors that must be considered is how much individuals are known (in terms of abilities and skills) to begin to develop their role within society. Dyer (1994) argues that, based on the acceptance of the basic role that these people play in the social environment, it is evident that as, the personal characteristics that define entrepreneurs are better known, they will be in an optimal position to promote business initiatives.

In this regard, there are a series of attributes that are commonly related to entrepreneurship and entrepreneurship, among these stands out the internal locus of control, propensity to take risks, self-confidence, need for achievement, tolerance to ambiguity and innovation (Dinis et al., 2013; Frese and Gielnik, 2014; Ndofirepi, 2020).

Dyer (1994) suggests that the most important characteristics for young students to show an inclination towards entrepreneurship, are found in psychological traits, traits that often determine the behavior of the entrepreneur translated into entrepreneurial activity in attitudes.

When trait theory was developed, prompted by McClelland (1961), the idea that entrepreneurs generally possess characteristics such as the need for achievement, power, affiliation, creativity and imagination, as well as a great capacity of negotiation and high risk propensity, grew popular (Green et al., 1996).

Likewise, Korunka et al. (2003), consider that the entrepreneur's personality must include certain specific features or characteristics. These features are provided by the environment with primary socialization (first nucleus or family), secondary (second nucleus, as it expands to school and close friends) or tertiary (awareness of their choice). Tertiary socialization explains that people are aware of their abilities, but that they decide what to do with those abilities. A proper illustration of this proposal could be someone who smokes and is aware of tobacco damage, yet still decides to smoke. The same happens with people who know they have entrepreneurial abilities, but their fears do not allow them to see beyond.

Husserl (1987) takes the capacity of self-consciousness as a starting point to assume a contemplative position regarding acts of self-knowledge, self-assessment and self-determination that lead the subject to adopting intentions and actions. These include entrepreneurship in which the subject requires the will to connect and to participate in the world of productive life.

3.4 From the environment to individual competences
Once personality is developed, it helps the individual develop their competences, and it is responsible for ensuring that every person entering the work-field faces the employability of the market. Labor competence is the operative element that links individual and collective capacity to generate value with work processes, so it constitutes a new alternative to improve the performance of individuals and organizations (Sánchez, Marrero and Martínez, 2005). Entrepreneurship is the ability of individuals who proceed with the needs of the environment to meet them in terms of company gestation (entrepreneurship) and development (leadership).

The competences are framed in "three major trends in the study" identified by Mertens (1996): the behavioral current (Sánchez, Marrero and Martínez, 2005); the functionalist current, based on two factors in school development: the person and position or the functions of said position (Mertens, 1996); and a third current developed in France whose main exponent is Claude Levy-Levoyer. The latter states that competencies are a list of behaviors that certain people possess to a greater extent than others and that make them more effective for certain situations.

The current that is closest to entrepreneurship and entrepreneurs' development process is the behavioral current, which focuses on behavioral change, a phenomenon that allows the entrepreneur (Gilder, 1984) achieve objectives, breaking old patterns and creating new ones. These patterns are first created by phenomenology, as each individual thinks how to do things differently (or how the development process of building a company should be).

Gibb (2005) proposed a series of business values that allow entrepreneurs to do, organize, feel, communicate, understand, think and learn vital things for their development. Meanwhile, Timmons (2004) makes a different integration with six broad categories: commitment and determination, obsession of opportunity, risk tolerance, ambiguity and uncertainty, creativity, adaptability and self-confidence.

According to Varela and Bedoya (2006, p.149) business competencies are the set of attributes (motivations, attitudes, values, knowledge, skills) of a person, which are manifested in definable, observable and measurable

behaviors, which are linked, in casual way, with superior performance in business action. Studies show that empathy is an important antecedent of business intentions, especially in the case of social entrepreneurship, given that empathic individuals are more likely to consider the well-being of other individuals (Dees, 2012; Santos, 2012).

This process of entrepreneurial competencies is clearly shown by Spencer and Spencer (1993) in an investigation conducted in Ecuador, Africa and Asia, in which the different local entrepreneurs had common competencies that allowed them to better implement their work as a company creator or market maker, depending on their business values and their own elementary model.

This generic model of competence for entrepreneurs includes the following competences: initiative, logic and problem-solving, personal maturity, influence, direction and control, orientation of others, and other competencies that are specific to Africa. People's development should thus be oriented to these behaviors for there to be a greater probability of success in the creation of companies.

As one of the conclusions of the study, people who have more developed competencies have a greater success factor. Also, entrepreneurs have a greater inclination towards thinking and solving problems, personal maturity, influence, and direction and control. The third conclusion is that history and demographic data do not distinguish the average or superior performance of entrepreneurs, that is, all people, regardless of their demographic position, have equal opportunities to create a business (Prahalad, 2005). The last conclusion points to the consistency of the characteristics, where the competencies found are essentially the same in all the countries in which the study was conducted.

3.5 The business strategy of the entrepreneur

When addressing strategy as an entrepreneurial factor, organizational strategy is relevant: it is understood as the framework that guides a company's work; an integral system that deals with the deployment of competitive priorities to ensure the generation of a product or service that meets consumers' expectations; a factor that must be present in the crystallization of the entrepreneur's idea.

Considering the field of knowledge for organizational strategy, it is quite prolific, and its route goes from classic authors to contemporary ones. For example, Mintzberg (1997) defines strategy through several meanings as a plan, a guideline for action, a model, a position, and a perspective. Situation that must be in the entrepreneurship plan. Porter, cited in Mintzberg (1997), states that every industry has economic characteristics that give rise to competitive forces, trends that must be identified at the beginning of the venture.

David (1997) states that strategic planning is the art and science of formulating, implementing, and evaluating interfunctional decisions that allow the organization to achieve its objectives. Ogliastri (2000) states that, in management, it has been understood as the configuration of long-term objectives, the criteria for guiding fundamental decisions, and the set of policies to carry out the necessary activities.

When entrepreneurs start the business creation process, the first thing they analyze is the best structure for the company and, in turn, the allocation of resources in search of profit maximization (Fierro, 1994). Chandler (1962) defines strategy as the element that determines a company's basic goals in the long term, as well as the adoption of courses of action and the allocation of the necessary resources to achieve those goals.

The strategist (or entrepreneur in this case) who wishes to position the company with the purpose of influencing the environment in favor of the organization must know the sensitivity of the environment and its trends, i.e., the competitive priorities considered as critical factors of organizational success, for the differentiation of the company and product, and entrepreneurship is more likely to succeed.

The internalization of the entrepreneurial structure that entrepreneurs and their teams have is a product of the environment where they have created their way of thinking, that is, the explicit and implicit strategy that every competing company in an industry has, as mentioned by Porter (2007).

As the company grows, it is important that entrepreneurs start assigning responsibilities and strategic business guidance. Johnson and Scholes (1997) affirms there are strategies at the different levels of an organization: Corporate level refers to its global or structural scope, or the way in which resources are allocated to the different operations. A second level is limited to the competitive or business strategy and refers to how to compete in the market, that is, what products or services should be developed and for what markets. The third strategic level is in the operating system of the organization and is where the operational strategies of marketing, finance, operations, among others, are proposed.

3.6 The individual within the organization
Entrepreneurship can be developed individually or organizationally (Farrukh, Ying and Mansori, 2016). Entrepreneurship within the organization is called "intrapreneur" (Pinchot, 1985) and includes all those actions of innovation and creativity that are carried out within the organizational environment.

Pinchot (1985), cited by Koontz, Weihrich and Cannice (2012), establishes the difference between intrapreneurs and entrepreneurs. While an intrapreneur operates within the organizational environment, focuses on innovation and creativity, and transforms a dream or an idea into a profitable project —sometimes considered a corporate project—, entrepreneurs act outside the organizational scope. The latter can see an opportunity, obtain capital, labor and other necessary supplies, and combine them in a successful operation, and are also willing to take the personal risk of success and failure (Koontz, et al. 2012).

Addressing the specific field of intrapreneurship, Schmelter et al. (2010) found empirical evidence on the strong impact that personnel selection, development and training, and the rewards have on corporate entrepreneurship practices. Wyk and Adonis (2012), citing Barrett, Balloun and Weinstein (2012), state that organizations should proactively identify and strategically align internal factors that could increase corporate entrepreneurship performance and sustain competitive advantage (Kuratko, 2009).

A successful intrapreneurship process calls for the simultaneous attention of innovation and exploitation (Hayton and Kelley, 2006; Zahra, 1996;) and therefore involves a collection of activities and processes. Likewise, corporate entrepreneurship requires the acquisition and development of new resources and new ways to reconfigure those resources, allowing the company to seek new business opportunities (Zahra, Nielsen & Bogner, 1999). Companies can participate in internal innovation in order to introduce new products or services or enter new markets.

Ferdousi (2012) warns that interfunctional corporate entrepreneurship teams can be used in an organization as an effective tool and their success will depend on the degree of dependence on tasks, openness, and communication between team members. The author also points out, citing Franco (1989), that intense competition in domestic and international markets requires corporations to introduce new and frequent market innovations. Thus, innovation and product development online, with technological changes and market conditions, are essential for organizations' survival, diversification, success, and renewal (Brown and Eisenhardt, 1995, cited by Ferdousi, 2012). To win the competitive race, corporations see the opportunities to be seized in corporate entrepreneurship or intrapreneurship practices. According to Ferdousi (2012), corporate entrepreneurship practices essentially help corporations quickly identify opportunities in the market and conceptualize ideas in order to develop products and strategies to support long-term business goals and organizational agility; and corporate entrepreneurship is a different form of the traditional approach to corporate management.

Intrapreneurship has a wide scope that can be approached from different perspectives. Thus, you can start from a current company or product to get a new one; make use of the organization's research and development assets and advantages to achieve innovation in new products, services, technologies or processes; the identification of new opportunities to improve the competitive advantage of the company, among others (Alam et al., 2020)

According to Kantis and Drucaroff (2009), corporate entrepreneurship is not only limited to internal ventures or corporate venture capital, but also includes organizational renewal and intrapreneurship, instilling a business perspective in employees, particularly behavior aligned with speed and flexibility in actions. Kantis and Drucaroff (2009) emphasize that both individual and corporate entrepreneurship create something new.

Some of the components cited by the authors are the unequal contribution between the different hierarchical levels and new projects, the fact that initiatives usually originate in senior management, the attitude of management in the face of the failure of new projects, internal communication deficiencies, centralization and rigid norms, the fact that superiors seem to not respect the authorship of the initiatives, that the levels of autonomy are very different, the lack of managers' time to identify projects and dedicate themselves to them, the lack of resources and, finally, a broad conferred valuation space for initiatives used by superiors.

3.7 The entrepreneur's development and education
For the entrepreneur, training is understood as the structure or improvement of the being. In the words of Vargas (2007), training requires not only the recognition of the anonymous constitutive character of the subject but its culture, but also understanding the foundational structures of the interaction of the world and life, and such transit considers both the formation of singular persons and the foundation of personalities of a higher order —family, community, neighborhood, city, nation, state, community of nations. Realities and experiences allow individuals to strengthen their values to increase the probability of choosing the path of entrepreneurship.

Furthermore, there are other actors in the same scenario. Paraphrasing Orrego (2009), entrepreneurship is explained not only from the self-knowledge, self-assessment and self-determination of entrepreneurial subjects, but the role played by entities or personalities of a higher order that intervenes in the social world, such as the State, organization, family and communities, among others, and the understanding of the interaction generated by entrepreneurship as a possibility of realization of the subject in life with others. This indicates that being an entrepreneur is not spontaneous, but it is an integral process of the human being that is strengthened and linked to its context, to the formation of the individual within it and to the opportunities it offers.

The concern to achieve an entrepreneurial education tends to be increasingly integrated into the government's agenda and includes actions ranging from elementary school to university. In this regard, Dether (2001) considers that people are born entrepreneurs, but education can facilitate the process of materializing good ideas in all fields of our intellectual and professional activities, while it makes us improve our attitudes and aptitudes for new ventures according to their context.

Thus, Campos and Méndez (2013) and Saldarriaga and Guzmán (2018) share the idea that education for entrepreneurship must be approached from the didactics of problem-based learning that allows, especially young people to recognize their rights and duties, resolve and address problems in a creative framework as inherent aspects of their entrepreneurial training, linked to regional development in economic, social and environmental terms.

Gibb (2005) states that business education must be integral and not fragmented; it must analyze the various elements of business activity in an integral, pragmatic and rational manner, looking at the synergies that may exist, given by the interaction of individual experiences that are marked by people's own reality.

Different studies have shown that education can stimulate the development of entrepreneurial behavior in different ways, especially business education has been linked to the emergence of entrepreneurship and entrepreneurship (Breznitz and Zhang, 2021). On the one hand, education for self-employment can increase knowledge about business creation and management, and promote personal characteristics associated with entrepreneurs such as achievement motivation, internal locus of control or self-efficacy (Bonnett and Furnham, 1991; Gorman et al., 1997; Hansemark, 1998; Krueger and Dickson, 1994; Rasheed, 2003), however, this would mean the change in the academic framework of an entire country for the teaching of learning.

Varela and Bedoya (2006) suggest that entrepreneurial training is a process in which countless social, cultural, psychological and economic variables are involved which contribute, with a set of specific knowledge, to develop a series of skills whose purpose is to make entrepreneurs have a high probability of becoming successful, and the capacity of generating wealth and social development throughout their life. The most important issue is to change and to strengthen the teaching model of entrepreneurship.

As evidenced with these authors, none shows the context for entrepreneurs' development, nor is it influential. The main issue is to understand the effects of these variables on the reality of each country and each sector where entrepreneurship activities are to be encouraged. In this way, business plans can be developed under a coherent framework and it will thus be feasible to propose government actions to support entrepreneurs (Duarte, 2007).

To conclude, education is the main source of entrepreneurial development in a country, while entrepreneurship is an engine of economic development and productivity of the regions (Brandstätter, 2011; Mwobobia, 2012); However, there are external variables that have a positive or negative impact on the process, for this reason it is important to contextualize the education of the entrepreneur according to the different regions.

Conclusions

Reality generates culture, culture generates environment, the environment generates ways of thinking that are activated in individuals' personality, which generates entrepreneurial features demonstrated in their behavior, developing skills that facilitate the path of entrepreneurship. Thus, there must be a change in education: it needs to be renewed based on each territory's needs, which vary according to the region. The entrepreneurial process must be strengthened in local areas, such as Latin American areas which are have disadvantages, oriented towards entrepreneurial development programs which must include components of entrepreneurship development. Also, more favorable environment conditions must be generated for the growth of new companies because the Latin American dynamic enterprises are the ones that face the most unfavorable conditions.

Adopting a systemic approach based on effort complementation is also necessary. The weaknesses identified in the Latin American entrepreneurial context justify the importance of assuming a strategy based on an integral and systemic vision, as it is fundamental to have an adequate evaluation of the functioning of the different factors that affect the entrepreneurial development system in each area.

In summary, the present study provided elements of judgment to broaden the horizon of understanding of the entrepreneurial phenomenon from the analysis of the two proposed dimensions (environment and individual), especially when there is a wide range of studies that address the phenomenon in a fragmentary and isolated, which denatures it and oversimplifies it.

Finally, some drawbacks of the study are related to the research method itself, so in phenomenology the weight assigned by the subject to the actions or factors within the phenomenon cannot be determined, so this remains, in part, to the interpretation and perceptions of the investigator. Consequently, some of the elements that will be analyzed here are considerations that the authors assumed as relevant from the review of documentary sources,

which in the end may include and exclude elements or variables in subsequent studies. Thus, this exception is left for those who wish to expand the universe of study.

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Fernando FIERRO is a full-time professor at the Faculty of Economics and Administration of the Universidad Surcolombiana. He has a doctorate in Management and a Master's in Administration. He has experience in research on organizational behavior and entrepreneurship.
ORCID ID: https://orcid.org/0000-0003-1593-6226

Juan Manuel ANDRADE is a full-time professor at the Faculty of Business Sciences of the Minuto de Dios University Corporation - Uniminuto. He is a candidate for a doctorate in Agroindustry and a master's degree in Human Talent Management. He has experience in research on prospective and organizational behavior.
ORCID ID: https://orcid.org/0000-0001-9644-0040

HOW COVID19 AFFECTS THE STOCK RETURN OF THE VIETNAMESE PHARMACEUTICAL INDUSTRY: EVENT STUDY METHOD

Lai Cao Mai Phuong

Faculty of Finance and Banking, Industrial University of Ho Chi Minh City, 12 Nguyễn Văn Bảo, Phường 4, Gò Vấp, Ho Chi Minh, Vietnam

E-mail: laicaomaiphuong@iuh.edu.vn

Abstract. The outbreak of Covid-19 had a negative impact on socio-economic activities and stock markets of many countries around the world. However, it could affect the pharmaceutical industry in a different way. The purpose of this article is to examine how the covid19 pandemic affects the share price of the pharmaceutical industry in Vietnam. Event study is the main methodology of this article. The three events selected for study include: (i) On January 23, 2020, the first two patients, Chinese nationality, were found infected with covid19; (ii) March 6, 2020: The 17th patient, an international student from the UK, started the wave of covid19 infection in the community in Vietnam; (iii) On March 30, 2020, Vietnam announced the nationwide outbreak of Covid-19 and implemented economic lockdown. The article found that the impact of the three events on pharmaceutical stock prices was sign inconsistency. Cumulative abnormal returns (CAR) is positive after the first and third event is declared but the CAR is negative after the second event is announced. Of the three events, the stock price response to the third was the slowest since CAR (0; 7) started to be statistically significant while the other two events CAR (0; 2) were statistically significant. The results from this study have added to further insights into the effects of disease on the response of pharmaceutical stock prices.

Keywords: abnormal return; lockdown; pharmaceutical industry; stock market

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1. Introduction

By the end of 2019, Vietnam's population size was 96.2 million, ranked third in Southeast Asia (after Indonesia and the Philippines) and ranked 15th in the world (GSO 2020). However, the value of healthcare and pharmaceutical spending per capita in Vietnam is 149 USD (in 2018) and 85 USD (2020), respectively, is

considered low compared to other countries in ASEAN. In 2018, on average, each Vietnamese spent $ 149 on health care, lower than Malaysia's $ 453, the Philippines $ 157, Thailand $ 271 and Singapore $ 3,244 (KPMG 2020). With a population of over 96 million people, but the value of spending on the health care and pharmaceutical industries in Vietnam is still quite low suggesting that this industry still has growth potential.

The Covid-19 pandemic had a negative impact on many stock markets around the world (Singh, Dhall, Narang, Rawat 2020). However, research results from scholars show that countries with the largest pharmaceutical industries in the world such as China, India (Mckinsey & Company 2020) or in developed countries like Australia, pharmaceutical stock prices in these countries all responded positively to news about the outbreak of Covid-19 Covid-19 (Al-Awadhi, Alsaifi, Al-Awadhi, Alhammadi 2020; Alam, Wei, Wahid 2020; He, Sun, Zhang, Li 2020; Mittal, Sharma 2021). How will Covid-19 affect the share prices of the pharmaceutical industry in developing countries with the pharmaceutical industry in average. Serious discussions are needed on this topic. These reasons motivate the author to study the effect of Covid-19 on the share price of the pharmaceutical industry in Vietnam.

In Vietnam, the first patient death related to Covid-19 recorded on 31/7/2020 (MOH 2020a) is quite long compared with the time when the first patient was found to be positive for this virus. Therefore, this paper examines three events related to the evolution of the Covid-19 epidemic in Vietnam, including: On January 23, 2020, the first patient positive for Covid-19 was found to be a foreigner; on March 6, 2020, it was discovered that the patient was an international student returning from England and then discovered many patients infected with the virus in the community; March 30, 2020 Vietnam announced Covid 19 outbreak in the country and then lockeddown the economy.

Research shows that pharmaceutical stock prices both respond positively to the first and third events when the cumulative abnormal returns are greater than zero after the event was announced. In contrast, the second event has a negative impact on stock prices when the cumulative abnormal return CAR (0; 2) to CAR (0; 9) is both negative and statistically significant. Inconsistency in the direction of events (positive, negative) on pharmaceutical stock prices is the finding of this study compared to the studies of Al-Awadhi et al. (2020), Alam et al. (2020), He et al. (2020), Mittal, Sharma (2021). This is also the main contribution of this study. In addition, CAR (0; 7) was statistically significant in the third event while CAR (0; 2) was statistically significant in the other two events. It shows that the stock price reacts most slowly to the third event. This study adds to the empirical evidence and new insights into the impact of the epidemic on pharmaceutical stock prices in developing countries with the pharmaceutical industry still in average.

2. Literature review

In the capital market, emergency events often affect investor sentiment and behavior in the stock market and are reflected in stock prices. The literature suggests that these events may not have the nature of common financial factors such as terrorism (Nikkinen, Omran, Sahlstr 2008; Masood, Javaria, Petrenko, 2020), weather (Phuong, 2019; Lanfear, Lioui, Siebert 2019), epidemic (Goh, Law 2002; Chen, Jang, Kim 2007; Mctier, Ts, Wald 2011; Li 2018). It can also be the potential events leading to policy changes in financial markets such as financial crisis (Al Rjoub, Azzam 2012; Schwert 2011), debt crisis in Europe (Righi, Ceretta 2011). In general, the results from these studies show that the market's response to these emergencies is often negative to most industries in the stock market, the number of beneficiaries is usually in the minority.

The pharmaceutical and healthcare industry is believed to be one of the few industries on the stock market to benefit from disease crises. The outbreak of SARS in 2003 in Taiwan had a negative impact on travel, wholesale and retail stocks, on the contrary, biotechnology industry stocks have seen positive gains from the event (Chen, Chen, Tang, Huang 2009). Chen et al. (2009) argued that due to the dramatic increase in demand for medical and

healthcare devices, these products are the output of the biotechnology industry, so the share price of they increase rapidly. This industry's positive response in Taiwan continues to repeat during outbreaks of infectious diseases such as dengue fever, SARS and H1N1 (Wang, Yang, Chen 2013).

Besides, the share price of the pharmaceutical industry also reacted differently based on the way of communication and disclosure of pandemic information to the public. Research by Jingwen (2005) in China shows that pharmaceutical stock prices have a significant positive reaction if information about the SARS epidemic is well disclosed. On the contrary, if the published information on the SARS epidemic is not prominent, the market reaction of listed pharmaceutical companies is negligible. Jingwen (2005) believes that this is an expression of the salience effects of Chinese investors.

Studies related to the Covid-19 outbreak in Australia, China, and India all showed the general trend that the healthcare and pharmaceutical industry's share prices responded positively to the pandemic news. In China, the pharmaceutical industry has outperformed the market (Al-Awadhi et al. 2020), the healthcare industry reacts negatively at the event day but the response was positive the following days (He et al. 2020). He et al. (2020) argue that this reversal is the Covid-19 epidemic that has encouraged companies to respond quickly by promoting the export of masks, ventilators and other medical devices.

Slightly different from the stock market in China, Alam et al. (2020) showed impressive positive returns on stock prices of the healthcare and pharmaceutical industries from the date the Australian Government issued the announcement of the Covid-19 outbreak and this positive trend is maintained until 9 days later.

Research on the Indian stock market, Mittal, Sharma (2021) analyzed with many different timeframes, the results show that the BSE-Healthcare index is the only industry that brings positive returns while the remaining branches are negative. BSE-Healthcare increased by 14.19% within 1 month (March 2020 to April 2020) from the date of the Covid-19 outbreak in India while the SENSEX benchmark index fell 12% during this period. If the period from February 1, 2020 to April 24, 2020, BSE-Healthcare increased by 18% while the standard SENSEX index decreased by 47.69% (Mittal, Sharma 2021).

The impact of Covid-19 on the Vietnamese pharmaceutical industry

Vietnam's pharmaceutical industry has a shortage of imported raw materials because Covid-19 has disrupted the supply chain. Annually, Vietnam Pharmaceutical industry must import 80-90% of raw materials as Active Pharmaceutical Ingredients. In which, China and India are the two largest sources of pharmaceutical raw materials in the world (Mckinsey & Company 2020) as well as Vietnam. In 2019, the proportion of pharmaceutical raw materials imported from China and India accounted for 63.7% and 16.7%, respectively, in 2019 (FPTS 2020). According to the General Department of Vietnam Customs*, in the first 2 months of 2020, due to the affected supply in the importing markets, the total value of import turnover of pharmaceutical raw materials of Vietnam decreased by 30.8% over the same period, reached 46.5 million USD. In which, the value of import turnover from China, India and the rest of the world is 27.2 million USD (-30.0% YoY), 9.4 million USD (-25.8% YoY), and 9.9 million USD (-24.3% YoY).

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[*] https://www.customs.gov.vn/Lists/EnglishStatistics/Default.aspx?language=en-US
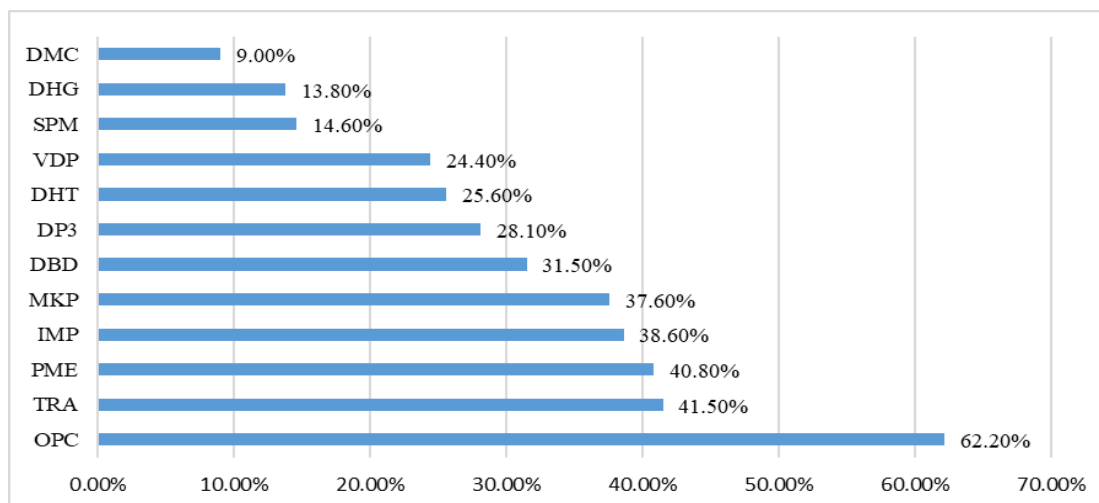
Figure 1. Percentage of material inventory value compared to the demand for raw materials of some pharmaceutical companies
Source: Financial statements of enterprises as at 31 December 2019 and FPTS (2020)

In Vietnam, after adjusting the value of inventories that are about to expire in 2020, of the listed companies, only 6 listed companies have an inventory ratio compared to the demand for more than 30%, including: OPC (62.2%), TRA (41.5%), PME (40.8%), IMP (38.6%), MKP (37.6), DBD (31.5%) (Figure 1). Therefore, the epidemic will make it difficult for the remaining pharmaceutical enterprises to import raw materials from China, India and other markets.

When the Covid-19 epidemic broke out, due to the psychology of storing and protecting health, the revenue of pharmacies and drugstores in Vietnam increased 164-168% in the first two months of 2020 compared to the same period in 2019. However, most of this profit belongs to foreign companies, and domestic pharmaceutical companies benefit very little from this growth. As the demand for preventive products has increased with a strong focus on masks, hand sanitizers and vitamins are not the main business items of listed pharmaceutical companies in Vietnam. These businesses mainly benefit from popular medicines such as pain relievers, antipyretics, cough medicines, eye-nose drops and sold through OTC channels. In which, DHG is the listed pharmaceutical company with the largest OTC market share of 7.8% for these products (FPTS 2020).

3. Research objectives and research questions

Research objectives: Up to now, researches on the impact of covid19 on pharmaceutical stock prices have mainly focused on countries leading in market share of the pharmaceutical industry in the world (Mckinsey & Company 2020) such as China (Al-Awadhi et al. 2020) and India (Mittal, Sharma 2021), or focus on developed countries such as Australia (Alam et al. 2020). However, the impact of covid19 on the industry's stock price in developing countries with an underdeveloped pharmaceutical industry has not been mentioned. Therefore, this article will fill this gap by studying the impact of covid19 on the share price of Vietnam's pharmaceutical industry in 2020.

Research questions: Overall study of Al-Awadhi et al. (2020); Alam et al. (2020); Mittal, Sharma (2021) are all using the event study method in the Australian, Chinese, and Indian stock markets. Therefore, this article also uses event study method to answer the questions:
- How does Covid-19 affect the share price of the Vietnamese pharmaceutical industry.
- What are the similarities and differences from the results of this study compared to the studies of (Al-Awadhi et al. 2020; Alam et al. 2020; Mittal, Sharma, 2021).

4. Methodology

This article uses an event research method to examine the effect of Covid-19 on the stock price response of Vietnam's pharmaceutical industry in 2020. The basis for selecting the event date, event window, estimate window and research model will be explained in this section.

Select the event date and event window: In Vietnam, the first patient infected with Covid-19 detected at the end of January 2020 was quite early, but more than 6 months later, on July 31, 2020, the first patient's death related to Covid-19 (MOH 2020a) is much better with world disease progression. Therefore, unlike Mittal, Sharma (2021) which uses the first reporting date of Covid-19 death in India as the event date, this study uses two event days including: time of identification of the first patient infected with Covid-19 virus and the timing of the discovery of patients that have the spread of disease in the community are the event dates. In addition, similar studies in China stock market (Al-Awadhi et al. 2020; He et al. 2020), India (Mittal, Sharma 2021), Australia (Alam et al. 2020) and Vietnam (Phuong 2021) have chosen the time of the outbreak of Covid-19 in the countries to be the event date, this article also selects the date when Vietnam announced the outbreak of Covid-19 as the date of the event. To avoid overlap between event windows, the paper used 9 trading days - before and after each event and at least 3 weeks between two consecutive events. In summary, there are three facts used to study the effect of Covid-19 on the share price of the pharmaceutical industry in Vietnam. The first event on 23 January 2020 Vietnam recorded the first patient infected with Covid-19 (Tuoitre 2020). The second event on March 6, 2020 marked the second wave of Covid-19 infection in the community in Vietnam (MOH 2020b). These are two events that happened before March 11, 2020, the day the WHO declared Covid-19 a pandemic. The third event to be studied was on March 30, 2020 when Vietnam declared a nationwide epidemic of Covid-19 (VGPnews 2020).

Select the estimated window: Similar to the Mittal & Sharma (2021) study of the pharmaceutical industry in the Indian stock market, this study also uses data one year prior to the event date to estimate. Therefore, the estimate window for each event is 250 trading days prior to each event.

Estimation model:
First, the daily return is calculated using the formula (1)
$$R_t = \ln (P_t/P_{t-1}) \qquad (1)$$
This article uses Brenner's Market Model (1979) to calculate abnormal return. This is a popular method used in event study. It was used by He et al. (2020) to study the effect of Covid-19 on stock prices in the Chinese stock market.
The expected return on the rate of return is calculated using formula (2)
$$ER_{it} = \alpha_i + \beta_i R_{m,t} \qquad (2)$$
Abnormal return is calculated by using the formula (3).
$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{m,t}) \qquad (3)$$
Cumulatve abnormal returns is calculated using the formula (4)
$$CAR\ (t_1, t_2) = \sum_{t=t1}^{t2} AR_{it} \qquad (4)$$
Where:
- P_t and P_{t-1} are closing prices of the pharmaceutical industry at day t and day (t-1); ln is the natural logarithm of P.
- $ER_{i,t}$ and $R_{m,t}$ are the daily expected return of the industry index and the return of the VNIndex at day t.
- α_i and β_i are regression coefficients of daily return between industry i and the market.
- AR_{it} is the abnormal return of industry i at day t, calculated as the difference between the actual return at equation (1) and the expected return in equation (2).
- $CAR(t_1, t_2)$ is the cumulative abnormal return of the pharmaceutical industry over the period from t1 to t2 for each event.

The t-statistic test is used to examine whether the movement of Covid-19 in Vietnam has an impact on the share price of the pharmaceutical industry. T-statistics are calculated at different timelines in each event window for easy comparison.

Research data: FiinPro (http://fiinpro.com/) uses daily capitalization weighting of all pharmaceutical companies listed on the Ho Chi Minh City Stock Exchange (HSX) and the Stock Exchange. Stock Exchange to calculate the Pharmaceutical Industry Index. This article uses the Pharmaceutical industry data compiled by FiinPro and the daily close of VNIndex on the HSX to examine the impact of Covid-19 on Vietnam's pharmaceutical stock price response in 2020.

5. Results and discussion

| (a) | (b) | (b) |
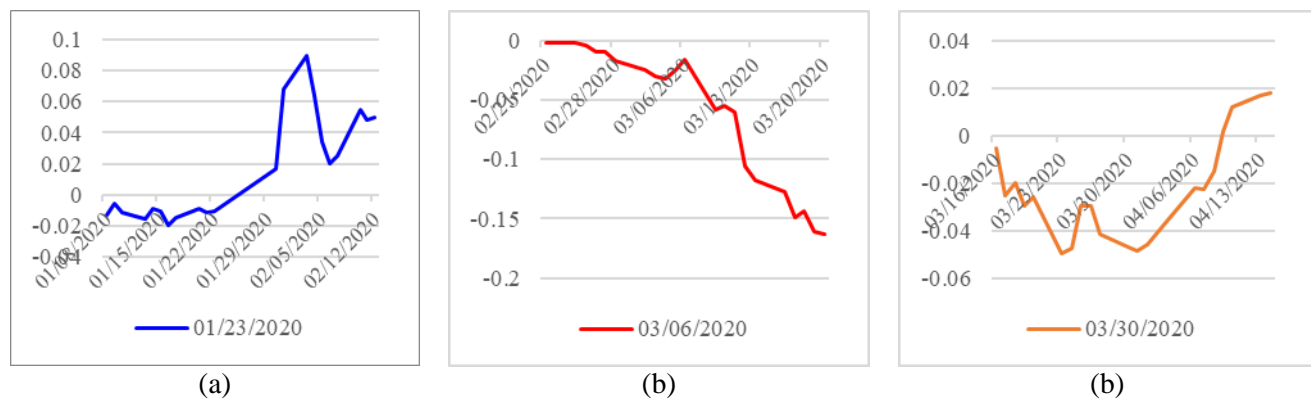
Figure 2. Pharmaceutical Industry Index's Cumulative Abnormal Return (CAR) around event dates

Figure 2a shows that the cumulative abnormal return CAR increased sharply after January 23, 2020 then plummeted but still greater than zero. It shows that the pharmaceutical industry's stock price trend is bullish and most volatile of the three events. Figure 2c shows that stock price movements also reacted positively after March 30, 2020, but the growth rate was slower and more stable than on January 23, 2020. In contrast to the first event and the third event, the cumulative abnormal return after March 6, 2020 were negative (Figure 2b). This is an interesting finding about the impact of Covid-19 on the share price of the pharmaceutical industry in Vietnam compared to the industry's research results on the Australian, Chinese and Indian stock markets (Al-Awadhi et al. 2020; Alam et al. 2020; He et al. 2020; Mittal, Sharma 2021).

Table 1. Results and t-statistic test of abnormal return (AR) for event dates

	01/23/2020		03/06/2020		03/30/2020	
	AR	t-test	AR	t-test	AR	t-test
-10	-0.013	-2.133**	-0.002	-0.304	-0.005	-0.637
-9	0.008	1.265	0.000	0.061	-0.020	-2.472**
-8	-0.006	-1.076	-0.002	-0.222	0.005	0.639
-7	-0.004	-0.693	-0.006	-0.839	-0.010	-1.226
-6	0.007	1.210	0.000	0.061	0.004	0.523
-5	-0.002	-0.271	-0.008	-1.098	-0.024	-2.965***
-4	-0.009	-1.519	-0.007	-0.896	0.002	0.223
-3	0.005	0.793	-0.005	-0.736	0.018	2.267

-2	0.006	0.944	-0.002	-0.298	0.000	-0.030
-1	-0.002	-0.349	0.007	0.967	-0.012	-1.441
0	0.000	0.027	0.009	1.189	-0.006	-0.686
1	0.027	4.567***	-0.042	-5.667***	-0.002	-0.190
2	0.052	8.699***	0.003	0.345	0.003	0.315
3	0.021	3.586***	-0.005	-0.690	0.010	1.193
4	-0.025	-4.248***	-0.046	-6.198***	0.014	1.769*
5	-0.030	-4.992***	-0.012	-1.595	0.000	-0.048
6	-0.015	-2.459**	-0.010	-1.375	0.007	0.887
7	0.005	0.816	-0.021	-2.836***	0.017	2.103**
8	0.030	5.055***	0.006	0.747	0.010	1.300
9	-0.007	-1.142	-0.018	-2.402**	0.005	0.574
10	0.002	0.311	-0.002	-0.252	0.001	0.131

Source: Author's calculations
*Notes: *, **, *** have statistical significance of 10%, 5%, 1% respectively.*

Table 2. Results and t-statistic test of cumulative abnormal return (CAR) for event dates

	01/23/2020		03/06/2020		03/30/2020	
[-t;0)	CAR	t-test	CAR	t-test	CAR	t-test
-10	-0.011	-0.579	-0.024	-1.047	-0.041	-1.623
-9	0.002	0.102	-0.022	-1.002	-0.036	-1.497
-8	-0.006	-0.340	-0.023	-1.084	-0.016	-0.713
-7	0.001	0.044	-0.021	-1.075	-0.021	-1.004
-6	0.005	0.331	-0.015	-0.818	-0.012	-0.583
-5	-0.002	-0.180	-0.015	-0.923	-0.016	-0.872
-4	-0.001	-0.065	-0.007	-0.482	0.008	0.510
-3	0.008	0.803	0.000	-0.039	0.006	0.460
-2	0.004	0.422	0.005	0.474	-0.012	-1.043
(0;t]	CAR	t-test	CAR	t-test	CAR	t-test
2	0.079	9.400***	-0.039	-3.771***	0.001	0.088
3	0.100	9.750***	-0.044	-3.479***	0.011	0.762
4	0.075	6.315***	-0.090	-6.118***	0.025	1.547
5	0.045	3.411***	-0.102	-6.187***	0.025	1.362
6	0.031	2.108**	-0.112	-6.211***	0.032	1.606
7	0.036	2.261**	-0.133	-6.824***	0.049	2.283**
8	0.066	3.906***	-0.128	-6.119***	0.059	2.596***
9	0.059	3.301***	-0.145	-6.571***	0.064	2.640***
10	0.061	3.230***	-0.147	-6.314***	0.065	2.546**

Source: Author's calculations
*Notes: *, **, *** have statistical significance of 10%, 5%, 1% respectively.*

Table 1 and Table 2: Presentation of results and t-statistic test of extraordinary profit (AR) and cumulative extraordinary profit (CAR) for event dates

First event: January 23, 2020.

Before the first event day, the day Vietnam discovered the first patient infected with Covid-19, neither abnormal return (AR) and cumulative abnormal return (CAR) for Pharmaceutical sector shares were insignificant. After the event date, the daily abnormal returns t = $\overline{1:3}$ and t = 8 are both positive with AR [1] = 2.7%; AR [2] = 5.2%; AR [3] = 2.1% and AR [8] = 3.0% and statistically significant 1%. Abnormal returns from date t = $\overline{4:6}$ are all negative with AR [4] = -2.5%; AR [5] = -3.0%; AR [6] = -1.5% and statistically significant are 1%, 1% and 5%, respectively. Cumulative abnormal return CAR (0; 2] later is all positive and statistically significant 1%. Cụ thể CAR (0;2) = 7.9%; CAR (0;3) = 10%; CAR (0;4) = 7.5%; CAR (0;5) = 4.5%; CAR (0;6) = 3.1%; CAR (0;7) = 3.6%; CAR (0;8) = 6.6%; CAR (0;9) = 5.9%.

Before Vietnam found the first case positive for Covid-19 and on the event date, the abnormal return and cumulative abnormal return were not statistically significant. It shows that the expected return is still matching with the real return on the stock price of Pharmaceutical industry. The Pharmaceutical industry's share price did not respond to the event as at 23 January 2020 when neither AR nor CAR was statistically significant. However, immediately after the fact that the stock price of Pharmaceutical industry increased for three consecutive days, leading to abnormal returns AR [1], AR [2] and AR [3] were all statistically significant and in the range from 2.1% to 5.2%; Cumulative abnormal return CAR (0; 2) = 7.9% and CAR (0; 3) = 10%. On the contrary, returns of the corresponding VNIndex during these days are -3.3%; -2.4% and -0.9%. This result shows that the share price of Pharmaceutical industry responded strongly positively after the day when Vietnam first discovered the patient positive for Covid-19. It supports the study of Al-Awadhi et al. (2020); Alam et al. (2020); He et al. (2020); Mittal, Sharma (2021) and additional empirical evidence for Vietnam's stock market. Investors have focused on buying shares of pharmaceutical industry because they think that during the epidemic period, the need to protect the health of the people increases will bring sudden profits for these businesses. However, the sharp decline of the general index, the VNIndex and the sharp increase in the healthcare industry's share price in days t = = $\overline{1:3}$ made the Pharmaceutical industry index correct in the next three trading days because of abnormal return AR [4], AR [5] and AR [6] are statistically significant and range from -1.5% to -3.0%. This price adjustment is significantly lower than the previous three days of strong price increases. This result made the cumulative abnormal return CAR (0; 2) to CAR (0; 9) were both positive and statistically significant. In general, the share price of the pharmaceutical industry has gone against the general trend of the market and responded positively after January 23, 2020 when Vietnam discovered the first Covid-19 patient.

Second event: March 6, 2020

An international student from the UK who was confirmed positive for Covid-19 virus on March 6, 2020 started this wave of virus infection in the community in Vietnam. Similar to the first event, both the abnormal return and the cumulative abnormal return of the pharmaceutical industry's shares were not statistically significant until March 6, 2020. The trading days after the second event, abnormal return are mostly negative but only 4/9 days in the event window have statistical significance including: AR [1] = -4.2%, AR [4] = -4.6%; AR [7] = -2.1% and AR [9] = -1.8%. Cumulative abnormal return after March 6, 2020 is negative and has statistical significance of 1%, including: CAR (0; 2) = -3.9%; CAR (0; 3) = -4.4%; CAR (0; 4) = -9.0%; CAR (0; 5) = -10.2%; CAR (0; 6) = -11.2%; CAR (0; 7) = -13.3%; CAR (0; 8) = -12.8%; CAR (0; 9) = -14.5%.

The second wave of Covid-19 infection in Vietnam is a surprise to investors because of both abnormal returns and the cumulative abnormal return on the trading days from March 6, 2020 or earlier in the event window frame is

not statistically significant. It shows that the pharmaceutical industry's stock price did not respond immediately to the event. Abnormal returns AR [1]; AR [4]; AR [7] and AR [9] both have statistical significance of 1% and the value ranges from -1.8% to -4.6%. This reaction of the pharmaceutical industry's stock price is in stark contrast to its response after January 23, 2020. The sharp decline in the share price of this industry when the second wave of Covid-19 virus infection in the community appeared in Vietnam could be explained by two reasons. First, when the number of patients with Covid-19 increased rapidly in many countries, on 11/3/2020 WHO declared Covid-19 a global pandemic. This causes the pessimism of investors to increase rapidly with a wide range, leading to a sharp decline in prices on the stock market. Secondly, Vietnam's pharmaceutical industry has a shortage of imported materials because Covid-19 has broken the supply chain, so they cannot exploit their own advantages during the epidemic. Vietnam closed its land border with China since the end of January 2021. While this is the largest import market for raw materials for pharmaceutical companies. According to the financial statements at the end of 2019, there are only three listed pharmaceutical companies whose raw material value is over 40% of the demand in 2020, including: OPC (62.2%), TRA (41.5%), PME (40.8%). The negative reaction of pharmaceutical stocks to the March 6, 2020 event in Vietnam is the new finding of this study compared to the studies of Alam et al. (2020) in Australia; Al-Awadhi et al. (2020) and He et al. (2020) in China; Mittal, Sharma (2021) in India.

Third event: March 30, 2020

After detecting a covid 19-positive patient in many provinces and cities nationwide, on March 30, 2020, Vietnam announced the nationwide epidemic of Covid-19 and immediately followed the economic lockdown. In the event window [-9; 9], the pharmaceutical sector only reacted on [4,7]. Abnormal returns AR [4] = 1.4% and AR [7] = 1.7% with statistical significance of 10% and 5%, respectively. Cumulative abnormal return CAR (0; 7) = 4.9%, CAR (0; 8) = 5.9% and CAR (0; 9) = 6.4% have statistical significance of 5%, 1% and 1%, respectively.

Similar to the two previous events, the abnormal returns and the cumulative abnormal return were not statistically significant at the Vietnam national epidemic announcement date suggesting that the pharmaceutical industry's stock price did not immediately respond to the news. this news. Similar to the two previous events, abnormal returns and cumulative abnormal returns were not statistically significant on the day the Prime Minister announced the disease nationwide. It shows that the pharmaceutical industry's stock price did not respond immediately to this information. Compared to the past two events, pharmaceutical stocks react more slowly to the third event when an abnormal returns exists starting from day t = 4 and cumulative abnormal return exist starting from day t = 7. Besides, the reaction of investors to pharmaceutical stocks this time was positive when AR [4], AR [7], CAR (0; 7), CAR (0; 8), CAR (0; 9) are both positive and statistically significant. The higher the cumulative abnormal return is, CAR (0; 7) = 4.9% <CAR (0; 8) = 5.9% <CAR (0; 9) = 6.4% shows the share price of pharmaceutical industry maintain momentum for days after the event announcement date. This result can be explained that when the economy is locked down due to the epidemic, most businesses in the economy have to close their business activities. However, in Vietnam, pharmacies are still allowed to operate under strict control. The privilege of not having to close pharmacies during the lockdown period is a favorable condition for pharmaceutical stocks to rise after this event. The reaction of the pharmaceutical industry's stock price to this event is similar to the results on the Australian, Chinese and Indian stock markets (Alam et al. 2020; Al-Awadhi et al. 2020; He et al. 2020; Mittal, Sharma 2021).

Conclusions

To examine the impact of the Covid-19 epidemic on pharmaceutical stock prices, this article uses three different events related to the evolution of the Covid-19 epidemic in Vietnam in 2020 on the pharmaceutical industry index.

The three events used in this article are: (i) January 23, 2020, the first discovery of a Covid-19-positive foreign patient; (ii) March 6, 2020: a citizen from the UK has been infected with the virus, opening a wave of Covid-19 infection in the community in Vietnam; (iii) On March 30, 2020, Vietnam announced a nationwide outbreak of Covid-19. The results showed that the pharmaceutical industry's share price mainly reacted after the date of the announcement. The differences of the results of this study compared with the study of Alam et al (2020) in Australia; Al-Awadhi et al. (2020) and He et al. (2020) in China; Mittal & Sharma (2021) in India is the share price of Vietnam's pharmaceutical industry that reacted negatively after the second event date (March 6, 2020). The significant decline in stock prices following the event could be attributed to negative investor sentiment and internal problems (lack of raw materials) of listed pharmaceutical companies. It implies that Vietnamese pharmaceutical enterprises need to have effective solutions for proactive and divers input of material sources. Cumulative abnormal returns were positive and statistically significant after the first and third event announcement were similar to the results from studies on the Australian, Chinese and India stock exchanges (Al-Awadhi et al. 2020; Alam et al. 2020; He et al. 2020; Mittal, Sharma 2021).

The reaction of pharmaceutical stock prices to inconsistent (positive, negative) signs with Covid-19-related events in Vietnam in 2020 implied that equity investment in potentially unexpected events. Risks. Hence, it is more suitable for venture capitalists. Understanding investment psychology, updating industry and business information will help investors reduce the risk of their decisions.

Although this study has pointed out new points and similarities about the impact of Covid-19 on Vietnam's pharmaceutical industry's share price compared to previous studies. However, this result is mainly focused on pharmaceutical companies being listed on the Vietnamese stock market, but not including unlisted pharmaceutical companies. This is the limitation of this study and also a suggestion for the next research direction.

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Lai Cao Mai PHUONG is a Doctor of Science in Banking and Finance. She has nearly 10 years working in securities companies and fund management companies in Vietnam. Participated in writing two textbooks and is the main author of many specialized scientific articles that have been published domestically and internationally. She is currently a lecturer at Industrial University of Ho Chi Minh City, Vietnam.
ORCID ID: http://orcid.org/0000-0002-2947-2488

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SURVIVAL AND GROWTH OF HUNGARIAN START-UPS[*]

László Radácsi [1], Judit Csákné Filep [2]

[1,2] *Budapest Business School, 1055 Budapest Markó utca. 29-31, Hungary*

E-mails:[1] laszlo.radacsi@uni-bge.hu; [2] csaknefilep.judit@uni-bge.hu

Abstract. Most start-ups die and most survivors fail to grow dynamically. The aim of the paper is to summarize the factors found in the international literature, supported by empirical research, that influence the survival and growth of start-ups, and evaluates the results of expert interviews conducted with renowned players in the Hungarian start-up ecosystem. During the research process fourteen expert interviews were conducted and analysed with combined logic, integrating deductive and inductive approaches. Based on the results, there is little overlap among factors identified in the international literature and those highlighted by Hungarian experts as influencing the survival and growth of start-ups. However, international and Hungarian results unanimously emphasize that entrepreneurial education, internationalization, acquisitions and heterogeneity of the start-up team's knowledge and skills play a significant role in the success of start-up businesses. Despite the limitations of the research, results may prove to be beneficial to both start-up ecosystem players and policymakers.

1. Introduction

Start-ups, which are often referred to as high growth companies, scaleups, gazelles, new technology-oriented companies, etc. (Eurostat-OECD, 2007; OECD, 2018; Szerb, Vörös, Páger, Ács & Komlósi, 2018; Vecsenyi & Petheő, 2017), are of increasing importance from the research and economic policy point of view, due to their prominent role in economic growth and promoting technological change (Szerb et al., 2018).

In the Central and Eastern European region, despite their relatively young and underdeveloped start-up ecosystems, we can experience evolving scientific interest in start-up companies. Benesova, Kubickova, Michalkova & Kroslakova (2018) analysed Slovak gazelles accelerating impact on the economy. They emphasize their positive effect on entrepreneurial thinking, culture and sustainable growth. Hrivnák, Melichova, Fazikova & Rohacikova (2019) examined the effect of universities in formation of knowledge intensive ventures. Their results show that university spill-overs affects development of knowledge intensive ventures, but only in case of services. Kállay and Jáki (2019) examined the impact of state intervention on the Hungarian venture capital market. Based on their results public funding in the Hungarian market did not function as an additional source of finance rather it causes a crowding out effect, gives rise to softer project selection standards and the portfolio financed by public funding is likely to end up below the value of the investment of venture capital funds.

The purpose of this study is to enrich our knowledge within two critical challenge of start-up companies, the factors influencing their survival and growth. The paper presents some relevant results of international literature review of the topics and the main findings of expert interviews. In our work we aim to uncover and compare with earlier international empirical research findings the factors influencing the survival and growth of Hungarian start-ups.

Start-ups are very fragile and hard-to-find in terms of data acquisition. As a result, qualitative research methodologies in some cases support their understanding more effectively than quantitative surveys. This is particularly true in a post-socialistic Central and Eastern European country like Hungary characterized by a young start-up ecosystem, where, unlike in the Western European and Anglo-Saxon ecosystems (Löfsten, 2016a; Löfsten, 2016b; Ejermo & Xiao, 2014; Xiao, 2015; Davila, Foster & Gupta, 2002), long term time series are not available for studying start-up businesses. Considering the above-mentioned challenges of Hungarian start-up companies' research, we chose expert interview method to enlarge our knowledge about the survival and growth of start-ups.

2. Review of the International Literature

As part of mapping the factors influencing the survival and growth of Hungarian start-ups, we reviewed relevant findings of the international literature. The research included the Web of Science Core Collection and ScienceDirect databases so that only articles reviewed at least twice and meeting the needs of advanced scientific research were included. As a further filtering criterion, we have focused on the processing of publications based on empirical research results.

2.1. Factors Influencing Start-up Survival

A study by Löfsten (2016a), examined the organizational capabilities that contribute to the survival of firms. Based on his findings, it can be stated that new technology-oriented businesses with higher levels of business experience have a better chance of survival. However, there was no detectable link between the higher levels of financing of new technology companies and increased chances of survival, nor between the increased presence of new technology companies in international markets and higher survival rates (Löfsten, 2016a). In case of non-

exporting technology-based firms and non-exporting firms in the service sector with a small team accelerator programs have a positive effect on survival (Del Sarto, Isebelle & Di Minin, 2020).

Another study by Löfsten (2016b) examined the effect of business planning, localization and patent development in the early years of the business on survival. His research proved that the importance of business planning and the choice of localization (proximity to important customers, suppliers, research centres, business organizations) have a positive effect on business survival. Patent development in the early years of the companies is also critical for survival (Löfsten, 2016b). Hornuf, Schmitt and Stenzhorn (2018) results confirm that number of filed patents decreases the probability of firm failure.

Ejermo and Xiao (2014) studied the survival of newly established technology companies. Their analysis covered all companies entering the market between 1991 and 2002 and followed their paths until 2007. They have shown that technology-based businesses have a lower risk of dissolution than other types of firms, and interpreted it as an indicator of higher "quality". In their analysis, a distinction was made between self-employed and non-self-employed new technology-based enterprises. Those who were self-employed proved to be more sensitive to changes in business cycles and the improved survival rates for new technology-based firms referred to those defined as non-self-employed. Their research concluded that new technology-based firms have a better survival rate than other types of firms, but only if they got past the phase of self-employment in their life cycle (Ejermo & Xiao, 2014).

There are two views on the impact of innovation on the survival of start-ups. One is that innovation improves firms' chances of survival through market power, cost efficiency, development of organizational capabilities (Schumpeter, 1934; Porter, 2006; Teece, Pisano & Shuen, 1997; Zahra & George, 2002). The opposite approach emphasizes that innovative start-ups need to deal with difficulties arising from inexperience and small size, and the level of these difficulties surpasses those found in non-innovative businesses. In the latter perspective, new, innovative firms have a lower chance of survival than non-innovative firms. Survival is influenced by a mixture of innovation uncertainty and successful and unsuccessful innovation efforts (Amason, Shrader & Tompson, 2006, Samuelsson & Davidsson, 2009). Opinions that emphasize the positive impact of innovation on the survival of start-ups are predominant in the literature. Nevertheless, Hyytinen, Pajarinen and Rouvinen (2014) found a negative correlation between innovation orientation and survival. Based on their analysis, they concluded that the survival rate of innovative start-ups is 6-7 percentage points lower than that of non-innovative start-ups (Hyytinen et al., 2014).

Criaco, Minola, Migliorini and Serarols-Tarrés (2014) studied the extent to which the survival chances of start-ups from universities are influenced by the human capital of founders, which has been divided into three dimensions: entrepreneurial, industrial, and academic knowledge. Based on their results, entrepreneurship education has a positive impact on survival, while previous entrepreneurial experience has no effect. Industry experience has a negative impact on the survival of start-ups due to the increased opportunity cost arising from attractive job offers to the founders. University background and attachment have a positive impact on business survival (Criaco et al., 2014).

Coeurderoy, Cowling, Licht and Murray (2011) examined the impact of internationalization on the survival of new technology-based firms in the UK and Germany. Their research showed that the survival chances of the companies they studied were enhanced by high absorption capacity, specific customer-supplier relationships, and internationalization (Coeurderoy et al., 2011).

In identifying the factors that play a role in the survival of start-ups, international research focuses primarily on elements that have a positive impact on, or do not influence the survival of the company, but does not extend to the causes of failure.

2.2. Factors Influencing Start-up Growth

Xiao (2015) studied the impact of acquisitions on business growth for new technology-based companies established between 1997 and 2002 in Sweden. The life cycle of the sampled companies was followed until 2009 and a subsequent quantitative analysis concluded that acquisition by Swedish multinationals had led to a significant increase in the number of employees. Acquisitions in other categories (non-Swedish multinationals, or Swedish non-multinationals) did not affect the growth in employment or sales. This digression is due to the different motivations and opportunities behind the acquisitions (Xiao, 2015).

Visintin and Pittino (2014) in their research on Italian spin-offs demonstrated that firms having founding members with both academic and non-academic experience were more likely to grow than firms started by less heterogeneous teams (Visintin & Pittino, 2014).

Ganotakis (2010) examining the performance of new technology firms in the UK concluded that firms founded by highly skilled entrepreneurs were better able to perform. Heterogeneous but complementary professional knowledge, such as technical education and related trade experience, or a combination of technical managerial and commercial experience proved to be most beneficial. The author draws attention to the need for both technical and business knowledge to develop and market innovative products and services (Ganotakis, 2020). Pearce and Pearce (2020) also highlights the use of advanced technology as distinguishing attribute of high-growth ventures.

Brinckmann, Salomo and Gemuenden (2009) examining the growth of German new technology companies, concluded that the involvement of external sources of financing has a positive effect on the growth of employment, but does not show a significant correlation with the increase in sales. This can be explained by the fact that the involvement of external resources allows the recruitment of staff potentially providing future growth, but the added value originating from this is delayed over time. An interesting finding of the research is that internal, operational financing also shows a positive correlation with the increase in the number of employees and sales volume. Although the literature generally emphasizes the importance of obtaining external funding, one of the driving forces behind the growth of start-ups is the ability to finance internally. The researchers point out that a significant proportion of the companies in the sample did not use any external financing at all (Brinckmann et al., 2009).

Ahmed and Cozzarin (2009) studied the impact of the financing structure on growth in Canadian biotechnology firms. Based on their results, business angels, venture capital and traditional (bank) financing all have a positive effect on the growth of firms. Government subsidies and stock market introduction did not correlate with the growth rate. With regards to the results, it is not clear whether the experienced growth was due to the sophisticated selection criteria on the part of the financiers, who are likely to finance companies with significant growth potential, or the extra management support and environment that benefit the companies receiving the funding (Ahmed & Cozzarin, 2009).

Davila, Foster and Gupta (2003) studied Silicon Valley start-ups based on data collected between 1994 and 2000. The focus of their study was on how venture capital financing affects the employment growth of start-ups. Although their analysis was carried out under a number of restrictive conditions, the results show that the employment rate of start-ups involving venture capital had increased even before their capital raising, and the increase continued in the months following the capital raising. According to their findings, venture capital involvement is a measure of start-up quality, and post-transaction expansion indicates that growth was hampered by the scarcity of financial resources (Davila et al., 2002). In case of digital start-ups Cavallo, Ghezzi, Dell'Era and Pellizzoni (2019) found that venture capital funds affect their growth positively. Caciolatti, Rosli, Ruiz-Alba and Chang (2020) examining UK high-tech start-ups came to the conclusion that start-ups with a social mission to obtain suitable funding and attain sustainable growth may de-emphasize short term profitability.

Colombo and Grilli (2005a) examining Italian start-ups, concluded that there is no significant difference between the size of companies financed by debt financing or the personal savings of the founders, while external equity financing is associated with larger firms (Colombo & Grilli, 2005a).

Colombo and Grilli (2005b) studied Italian high-tech industry start-ups, examining how the human capital of the founders influenced the performance of the firm. The educational background and previous work experience of the founders also play a role in the growth of the enterprise. Economic and management studies and to a lesser extent technical knowledge have the greatest positive impact on growth, while the analysis did not show a significant relationship with other types of education. Rapid growth was mainly supported by previous entrepreneurial experience, work experience in the technical field, and to a lesser extent by trade skills (Colombo & Grilli, 2005b). Chatterji, Delecourt, Hasan and Koning (2019) found the peer advice positive effect on growth and survival of start-up companies. At the same time formal management training proved to be a substitute for informal peer counsel.

According to the reviewed international literature, the growth of start-ups is measured by revenue, sales volume, and staff increase. However, in the case of start-ups, investors often measure growth in the change in goodwill, and the criteria for becoming a unicorn start-up (worth more than $1 billion) are not dependent on sales or number of employees but the value of the company. This discrepancy between science-based research and the valuation criteria adopted within the start-up ecosystem is also an indicator of the complexities characterizing the study of the narrow and very specific start-up business.

Summarising the international literature results, founders' industry experience, entrepreneurship education, internationalization, acquisition, heterogeneity of knowledge and skills of the founding team, the ability to finance internally from operations and involving external sources of finance positively affect the growth of start-ups.

3. Methodology

While uncovering the factors influencing the survival and growth of Hungarian start-ups, the characteristics of the Hungarian start-up ecosystem, the lack of a reliable, full-scale database on start-ups (Csákné, Radácsi & Szennay, 2019), and time-series data looking back on several years that would make it possible to conduct studies similar to the quantitative analyses found in international literature (see: Löfsten, 2016a; Löfsten, 2016b; Ejermo & Xiao, 2014; Xiao, 2015; Davila et al., 2002) justifies the application of qualitative research methodology tools.

The strength of qualitative field research is its validity, as such depths and aspects of the phenomena under study that would be unattainable through questionnaire surveys become graspable (Babbie, 2003).

The data in our research were collected in the framework of expert interviews. Pfadenhauer (2009) emphasizes that expert interviews can be interpreted as independent procedures within the realm of qualitative interviews. In their application, the interviewer is very important, and their knowledge and skills in the subject are essential for deep professional interaction (Pfadenhauer 2009, in Bogner, Litting & Menz (Eds.), 2009). Expert interviews were conducted exclusively by research professionals on the basis of an interview outline.

Sample selection was crucial to the success of the research. Babbie (2003) distinguishes four types of non-probability selection: reliance on readily available persons, expert sampling, the snowball method and quota sampling. To achieve the maximal richness of potential data we used expert selection. An important consideration was to ensure the heterogeneity of the sample so that all segments of the ecosystem were included in the survey: public and private financiers, incubator houses, transfer offices, start-up program managers, opinion leaders, mentors, academics, researchers. Only renowned start-up professionals were asked to participate in the research. The fourteen interviews were conducted by the members of the research team between November 2018 and

February 2019. Interviews were recorded in audio form. The audio materials were typed, the total length of the interview transcripts is 232 pages, their average length is 15 pages. The researcher team ensured full anonymity to interviewed experts. Direct quotes from expert interviewees are in quotation marks in italics. Based on the interview transcripts, we used the variable-oriented analysis in interpreting the expert interviews in order to explore correlations (Babbie, 2003). The expert interviews covered several other issues besides the survival, and growth of start-ups. In the first phase of the analysis, we extracted from the available texts the ideas related to the survival and growth of start-up companies.

The qualitative content analysis of the available text was carried out with combined logic, integrating deductive and inductive approaches. Based on the international literature of the topic, a code list was prepared deductively, using a priori coding. In the next step codes in the code list and related text segments were connected. To describe the specific, unique factors influencing the survival and growth of Hungarian start-ups, additional codes were determined inductively from the text, complementing the code list defined on the basis of the literature (Mayring, 2000; Sántha, 2013).

One of the functions of triangulation is to ensure the validity of qualitative research. According of Sántha's (2017) triangulation typology synthesis we can differentiate triangulation of theories, methodologies, persons and data. In our research we applied triangulation of persons. „When examining a phenomenon, situation, object, person, group, different people are involved in data collection and analysis." (Sántha, 2017, p. 36).

Researchers have different professional background and they have different experiences in business research and start-up operation. The data analysis was organized in two stages. The researchers independently identified the parts of the text which connected to the codes defined by deductive logic based on the international literature. During thematic workshops they cross-checked the results of their independent coding and determined the final position of differently coded elements. These thematic workshops also made possible to inductively identify codes which specifically describe the survival chances and growth potential of Hungarian start-ups. The weakness of the followed data analysing method is that the coding was conducted manually, followed by verbal consultation without systematic evaluation of the reliability. In spite of this shortcoming, the results can be considered reliable as a comprehensive code list has been developed by processing relevant international literature. The research is addressing a topic that is widely examined internationally and touchingly in Hungary. The most valuable research results are not the identification of survival and growth factors, but the comparison of international research findings and the experiences of Hungarian experts. The weakness of the used methodology may be partly offset by the prior individual and collective knowledge and experience of the researchers. Table 1 summarizes the factors influencing the survival and growth of start-up companies according to international literature and the codes inductively identified during thematic workshops. Factors that have been identified also in international literature and during expert interviews are shown in bold in the table. In the Survival / Growth columns (e) indicates if the factor was mentioned in the expert interviews.

Table 1. Factors influencing start-up survival and growth in international literature and codes identified through open coding

Factors influencing survival, growth / Codes used in the analysis	Reference	Survival +/-	Growth +/-
Codes based on literature			
Higher-level business experience, specific business relationships	Löfsten, (2016a), Ejermo & Xiao (2014), Coeurderoy et al. (2011), Del Sarto et al. (2020)	+	
Importance of business planning	Löfsten, (2016b)	+	
Localization	Löfsten, (2016b)	+	
Patent development during the initial period	Löfsten, (2016b), Hornuf et al. (2018)	+	
Innovation orientation	Hyytinen et al. (2014), Pearce & Pearce (2020)	-	+
Founders' industry experience	Criaco et al. (2014), Colombo & Grilli (2005b)	-	+
Entrepreneurship education	Criaco et al. (2014), Colombo & Grilli (2005b), Chatterji et al. (2019), *expert interviews*	+	+ (e)
University experience and attachment, absorption capacity	Criaco et al. (2014), Coeurderoy et al. (2011)	+	
Internationalization	Coeurderoy et al. (2011), *expert interviews*	+	+ (e)
Acquisition	Xiao (2015), *expert interviews*		+ (e)
Heterogeneity of knowledge and skills of the founding team	Visintin & Pittino (2014), Ganotakis (2010), *expert interviews*	+ (e)	+
Ability of internal financing	Brinckmann et al. (2009)		+
Attracting external sources of finance (equity and debt)	Brinckmann et al. (2009); Ahmed & Cozzarin (2009), Colombo & Grilli (2005a), Davila et al. (2002); Cavallo et al. (2019)		+
Open codes			
Professional and management knowledge		+	
Conflicts		-	
Financial problems		-	
Early encounter with the market, emergence of market-based thinking		+	
Proper timing		+	
Lack of effective incubation and mentor support		-	
Socio-cultural past		-	
Conflict of short-, medium- and long-term financial goals and opportunities		-	
Annuity hunter attitude		-	
Low motivation level of founders			-
Lack of entrepreneurial, financial and management skills			-
Luck			+
Distrust			-

Source: Own compilation

From among the factors influencing the survival and growth of start-up companies indicated in international literature we were able to identify four through the analysis of expert interviews: entrepreneurial education, internationalization, acquisition, and the heterogeneity of the start-up team's knowledge and skills.

4. Results of the Research

4.1. Survival

Survival is the first step in starting a successful start-up business. In the creative terms of one of the experts, start-up companies need not only to have strong growth potential, but to be able to survive under all circumstances, and to adapt to changed circumstances very quickly and efficiently:

"Investors are no longer looking for unicorns, but cockroaches."

The factors influencing the survival of start-ups identified in the interviews can be divided into three large groups. First are internal factors such as professional and managerial knowledge, team weakness, conflicts, funding problems, and timing can be identified. Then as external factors, experts noted the importance of timing and the lack of effective incubation and mentoring support. While the third major group, under the heading of sociocultural factors, includes values rooted in the past, the conflict of short-, medium- and long-term financial goals and opportunities, and the annuity hunter attitude.

Among the factors influencing the survival of start-ups the most numerous are the **internal factors**. Many experts emphasized the importance of having **professional and managerial knowledge**. This partly includes knowledge of the product or service, the level of which is generally considered appropriate by the experts among start-ups. However, they see serious flaws in business and management knowledge:

"Business knowledge, business attitude, project management, financial literacy, market knowledge, market research methodology, marketing, even product development methodology are completely missing in people ..."

Much depends on a good team for survival, the existence of which can drive a business through many difficulties. Experts (in line with international literature) emphasize the importance of the heterogeneity of the founding team: the more extensive the knowledge and experience of the start-up team, the more it assures its survival.

"*The most important factor for survival is the team. Having expertise, sales, marketing, coordinator or managerial competencies available or at least financially secured within the team, can provide a very significant sense of security in the early stages because it can be built on."*

Conflict within the founding team has a negative impact on start-up survival and can lead to the early death of the company. Experts have found that it is common for owners to have disagreements already at the outset, without becoming a real team, and thus not being able to keep their company alive until they reach market success.

"The two owners are already quarrelling at the beginning, and cannot survive the period when market successes aren't coming yet ..."

Another feature of the conflicts is the tension arising between the founders and investors, the aggravation of which leaves its mark on their working together, thus endangering the survival of the fragile start-ups.

"*It is probably the worst-case scenario if there is tension between the founders and the investors. It is very difficult to treat as if nothing had happened and keep everyone just going on."*

Although at the time of the expert interviews, Hungarian ecosystem was not at all considered to be lacking in resources, potential funding problems, such as poor financing schedules or investor expectations that disrupt the business, negatively impact start-ups' chances of survival.

"The funding environment in Hungary today can definitely help the team get started and keep it alive ... Which is very good, on the one hand, because it seems that the teams will not fail because of an initial lack of funding."

Despite the abundance of resources, the start-up may not schedule capital raising adequately. They do not begin to prepare for the next round in time, leading to unfunded periods that many businesses cannot survive.

"If a start-up can't raise capital at the right time, or when they run out of resources, they'll probably die."

Many teams find it difficult to cope with the performance burden brought on by the involvement of external investors: "*From there on, there is pressure on them to generate measurable performance. Not all teams can handle this."* This could even lead to the end of the start-up.

Beyond the expected performance and its psychological burden, the *conditions* dictated by the venture capitalist can also have a destructive effect: *"What kills the start-up is that they get stuck in a set of conditions (dictated by venture capitalists) that prevents them from fully developing in their original direction."*

Of course, the situation for venture capitalists is not easy either, as they have to account for the money invested in start-ups and the realized or missing profits. Rigid application of the rules and policies that bind them, or their inexperience, could easily mean the end of otherwise promising start-ups.

"There was a venture capitalist who killed a lot of good ideas because he believed that if the first business plan wasn't fulfilled, decision-makers had to go to jail because they bet on the wrong horse."

The termination of a start-up is often preceded by a lengthy vegetation period, which can be avoided or shortened by meeting the market as soon as possible and the founders developing market-based thinking as soon as possible. Experts mentioned the phenomenon that some start-ups have appeared at various start-up competitions for years, but failing to produce any results. They often do not even meet the market where they could validate their ideas. This would be important because although the product and service of many start-ups *"make life just a little bit easier, better, more practical, but only serve an already served need better."*

And this in no way guarantees that customers would be willing to replace their used product or service with a new one.

Meeting the market as early as possible allows the business to succeed in a new area by modifying its product, service, or profile and exploiting the competencies and resources available to the team, or sooner or later we will encounter the start-up unable to develop in the cessation statistics. Letting go or modifying the original idea does not mean the failure of the start-up, since working on it, testing it was a very serious learning process for the team, the conclusions of which could be used to implement a new idea. One expert highlighted the 'grow fast - fail fast' approach:

"Either 'Grow fast or fail fast', rather than wanting to keep it alive at all costs. If it doesn't happen, there is no market feedback, leave it and try something else! "

While the experts interviewed mentioned several factors inherent in start-up businesses that threaten their survival, two external factors were brought up: the importance of timing and the role of incubators and mentors providing effective support.

Timing is very important so that the market is ready for the product and service provided by the start-up.

"Timing is of incredible importance, having a particular idea at that point in time, that year, that decade, that particular point on the consumer fashion curve, is of great significance, is a rather random thing."

One way of remedying the lack of professional skills that threaten the survival of start-ups within the company is through mentoring and coaching.

Mentor support would be very important in the life of start-ups, as an experienced mentor can provide guidance to the founding team at several critical points. However, the culture of mentoring in the Hungarian ecosystem is poorly developed (Zsigmond, 2019).

"The startupper in my head is rather young, but there is a mentor around him or her. In the big American, Western European, Israeli start-up stories, there is always a phrase that appears sooner or later, saying 'I had this mentor, or right at the beginning, when we went to the stock market, I asked three of my role models on my board of directors who are still helping me', so he/she's a young person, but with the support of the wise ones."

According to another expert, mentoring would be important not only at the very beginning but also later, at the market expansion phase. This shortcoming, in the expert's opinion, leads to the failure of many teams because they don't get help when they actually need it the most.

In some respects, the Hungarian **socio-cultural environment** also affects the survival of start-ups. The high level of mistrust and individualism characterizing Hungary results in a mistrustful and fragmented society. Sharing new ideas and thoughts with the public is not typical (Hofstede-Hofstede, 2008; Muraközy (Eds.), 2012).

"We do not start spreading our stuff in a network-like, flu virus-like mode, but we immediately conceal, cover, hide, wrap, encrypt it."

Lack of trust means giving up the possibility of early validation. A hidden idea does not receive advice that can be key to it becoming successful, and this can even lead to its slow death.

The lack of a "failure culture" in Hungary also affects the survival and success of start-ups. Fear of failure and mark of failure are barriers to both development and a fresh start:

"Perhaps one of the weakest points in Hungary is the fear of failure or starting anew. If you once had an idea but failed, you are done ... In America, if you have to say something, you say, 'Okay, now, this failed, let's see what's next?'"

Hungarian start-ups differ not only in their attitude but also in their financial opportunities, compared to their western counterparts:

"There must be a lot of people, let's say in Hungary, who have only one chance."

In an uncertain livelihood environment, the likelihood of trying out a start-up entrepreneurial lifestyle is lower on the one hand, and on the other, the failure tolerance of start-up entrepreneurs is also lower. Delayed financial results can lead to giving up your company building dreams sooner.

Founders sometimes sacrifice their start-up on the altar of better financial results attainable on a short- to medium term through other activities:

"On a medium-term scale, it was much better for them to stay in their profession or start their individual businesses separately."

The family background and the lack of previous savings of Hungarian startuppers do not allow for bridging long periods without revenues. The majority of Hungarian start-up founders cannot afford to work persistently in the hope of future gains. Investors must ensure not only the development of the business but also the financing of the founders' everyday lives.

In Hungary, start-up financing can be considered favourable. This is positive on the one hand because the initial lack of funding does not lead to the failure of promising teams, however, on the other hand, a negative practice, a sort of **annuity hunt** can develop, which distorts the ecosystem. This is how we can find start-ups in the ecosystem that have been going to competitions, and have also been successful in attracting various capital investments and grants for many years. Although their ideas may be excellent, they have not even met the market, perhaps because of their engagement in a start-up competitions. The presence of these types of start-up companies in the ecosystem is considered damaging by many experts, as an artificially surviving business will never produce results and the start-up team will not develop either. They do not learn, do not begin to implement a modified or even a completely new idea. The focus of their opportunistic behaviour is to maximize the annuities and benefits of the support system they have become familiar with, the closure of which will result in the termination of these types of start-ups.

4.2. Growth

Growth and growth potential as criterion requirements are of paramount importance already in the definition of start-ups. However, what we mean by growth is far from clear. An increase in sales, profit growth, an increase in the number of users, an increase in the number of employees or a positive change in the estimated goodwill can all be considered as growth.

What's more, the expectation is not just growth, but dynamic growth in the case of a start-up. However, as one of our interviewees has pointed out, dynamic growth is most typical for companies with a low base value, i.e. companies in the initial phase starting from a low level. Companies that are already mature and have high revenues struggle to grow dynamically.

When defining growth from a financial perspective, start-up companies need to delineate the ability to generate revenue and profit, and liquidity balance, which factors are often not clearly separated.

"They can't say that they're profitable, just that they're cash-flow positive. So, cash flow positive means that they have enough money so as not to use the investors' money up and be in trouble, but it does not mean that they are profitable."

"The goal of an entrepreneur is not to benefit the venture capitalist one hundred percent. The entrepreneur wants to make his or her dream come true. They are both interested in the growth of the company, but their motivation behind it is different. Growth does not necessarily mean the same thing for them. There is a rather strong source of conflict here in certain cases."

Motivation is key to achieving continued growth, as it urges the team to get their company to the highest possible level. However, according to several experts, in our domestic environment this type of motivation does not last till maximum growth can be achieved. One of our interviewees believes that growth only reaches the level with which the owners are happy.

"They are satisfied with the level of income, the profits they have made. They have no ambition to grow, expand, spread."

The growth path appearing in international literature, i.e. the acquisition of start-ups, has also been mentioned by our experts (Xiao, 2015).

"Successful Hungarian start-ups have all been successful because they have been bought up at a relatively developed stage of theirs… but the real big leap has already been taken by the foreign owner. These are all businesses that were made operational by the Hungarian team and then sold off for a lot of money."

A globally accepted change is that *"big companies have made a move on start-up businesses."* They no longer buy up small businesses in their initial phase, but they „*grow them for themselves"*, and only larger, successful companies can expect to be bought up. Acquisition as a typical end for start-ups, however, is becoming more common, which is a likely path for Hungarian start-ups as well.

"It's not likely for you to become the next Facebook, but you can get 100 million EUR for your business, which is not bad."

Just like professional knowledge and management skills play a key role in the survival of start-ups, the experts pointed out that **lack of knowledge, and unpreparedness in the areas of entrepreneurship, finance and management** are also often barriers to the growth of start-ups.

Growth requires **start-uppers** who are able to lead an idea and later a business through turbulent times, who are flexible enough to move along with the changing market and the ever-changing entrepreneurial organization.

„*Talent management is lacking greatly. This is a very important thing. How do we find that 35-45-year-old woman or man who will make this firm successful?"*

„*Entrepreneurship attitude is fundamentally different in Hungary and Europe – parents dream of their kids becoming the prime minister and not Steve Jobs."*

Some Hungarian start-ups look at capital raising as the aim and not the tool that helps in future success.

"A lot of start-ups celebrate securing an investment, though there's nothing to celebrate in selling part of your business to an ex-banker."

Some domestic start-ups do not understand how venture capital works - experts emphasize. There is no point in having money if companies do not understand what it is for. Some of them feel that there is no financing because they do not understand that the investor would finance scaling and not development projects. Beginners and young people, in particular, are not prepared for capital raising, and many are shaken by the fact that they need to give the investor a share.

"It needs business intelligence and knowledge to understand that you do not look at the shares, but the total of the cake you have a share in."

According to experts, the main obstacles to the next big start-up success in Hungary are the lack of marketable products and the lack of management and sales capabilities.

"The barrier to growth is not money, but a lack of management and business thinking. There is no real marketable product, and most are not based on real needs. They think about what they want to change in the world, not what the world wants."

"In many cases it is also obvious that the founder is a very good professional with a very credible ability to represent the product, even in sales, but lacks management abilities, and that can be a serious handicap. Besides, if the person with the greatest stake or decision-making power does not realize this, it can block start-up development for quite some time, or it completely blocks the possibility of moving forward."

There might be historical reasons behind the above. Many present-day startuppers graduated in the late eighties and early nineties without receiving any training of this type. Although management can be learned, most of them do not see a real need for it.

Most of the interviewed experts pointed out that those Hungarian start-ups can grow really well that **enter the international market** very soon. In addition to supporting new ideas and the birth of more start-up companies, one of the biggest tasks of the domestic ecosystem is to support their entry into the international market:

"The big challenge is what will happen after the product is completed at home, and it entered the local market, how to ensure growth, how to enter the international market."

Several experts emphasized that dynamic growth cannot be achieved in the Hungarian market alone. Achieving truly outstanding results is unthinkable without an international market presence.

"The Hungarian market is limited with its ten million people for any product or service. The number of users can only be significantly smaller than this, making dynamic growth very difficult. Dynamic growth can be achieved in Hungary for a certain period of time, but this period is very short, and from then on it cannot be sustained or developed."

"Only an infinitely tight segment can grow in a market of ten million people to meet the proceeds expectations of a normal or average venture capitalist. We need not plan for bigger but for international growth because it obviously goes hand in hand with a bigger one."

In some incubators, it is a basic requirement that the European Union should be the minimum target market for supported start-ups, as in a project with a smaller focus there will be problems with later investor involvement. Although experts agree on the importance of an international presence, it is difficult to successfully enter the global arena from the domestic market (which is too small in some respects and too large in others).

"I think part of the problem is that everyone understands that these ten million people are very few. But on the other hand, it is still quite a lot. The great advantage of Estonia is that they are one-tenth as many as we are. This means there is no local market, so everyone goes to the international market right away and immediately faces the problem that they don't speak the language, they don't shop the same way in the stores, they don't talk about the weather the same way ... So, all the minor cultural, customary issues and other problems are handled differently and they must adapt immediately."

Experts have identified many difficulties in entering the international market. The unknown market, the lack of language skills and the lack of contacts are challenging. Proficiency and self-confidence in sales are essential for international success. Most Hungarian start-ups are in a way bound, lacking the courage and will to move their company into a sparkling ecosystem that can more effectively support their goals. In the domestic ecosystem, we can also see the 'sandpit effect'. Teams think they first try out their idea in the domestic market and, if successful, they'll move on to the international level. In the end, however, many are unable to leave the comfort of the domestic market.

Not all start-ups that are successful in their entry into the international market or who are looking for international opportunities right from the start will succeed either. Beyond the huge amount of work and perseverance, you need some **luck** as well.

"There's a little bit of ..., though I don't really like it, there's a little bit of a fluke factor in this. Who do you find and who is willing to deal with you? Obviously, you need to be a bit pushy, one who can't be shamelessly bold in good faith, will not play ball here."

Those who are not brave, persistent, fortunate enough will go down the road to becoming SMEs, and although they may still define themselves as start-ups, they will, in fact, cease to be that.

"Some remain in the Hungarian market. They say that entering the international market would be too expensive, or use up too many resources, too much time, or would really use up factors that the founder or team members consider to be too much. However, they realize that in Hungary they have or are going to achieve a sufficiently high level of income, which helps and supports their life or other aims, and the firm effectively transforms into a properly prosperous SME. There is no problem with this, from this point on they are not so much a start-up anymore, but they remain a useful contributor to the Hungarian economy."

Start-up companies are also hampered by **the lack of confidence** characteristic of Hungarian society. Many Hungarian start-ups put their product on the shelf because they are not willing to test it on live users due to mistrust.

"It's an idiotic mindset, but that's what we have at home. 'I am not going to show it to anyone because they'll steal it.'"

In many cases, entrepreneurs are also unhealthily distrustful of the investor. Sometimes because they come from the old business world and they do not understand or believe in the functioning of this ecosystem. The consulted experts cited an example where a contract was not sealed even with the third investor because the founders were frightened of having a competitor in their portfolio.

"The start-uppers feel, they want to invest to ruin them. Of course, this can happen, but there are much easier ways to ruin someone than having to put 200 million HUF in their company first."

The surveyed experts agreed that unfortunately, the growth rate of Hungarian start-ups is far below expectations. Several reasons have been identified for this. The most important ones are the lack of knowledge and the weakness in entering the international market, which in some respects can be attributed to the lack of the necessary knowledge, skills and competencies.

5. Conclusions and recommendations

As part of our research, we have collected the factors found in the international literature which have been proven by empirical research results to influence the survival and growth of start-up companies. In order to understand the Hungarian situation, we conducted fourteen expert interviews on the topic, and through their analysis, we have identified the factors that influence the survival and growth of domestic start-up companies. Aggregated results are depicted on a concept map, which aids the exploration and interpretation of data relationships by graphical representation (Babbie, 2003).
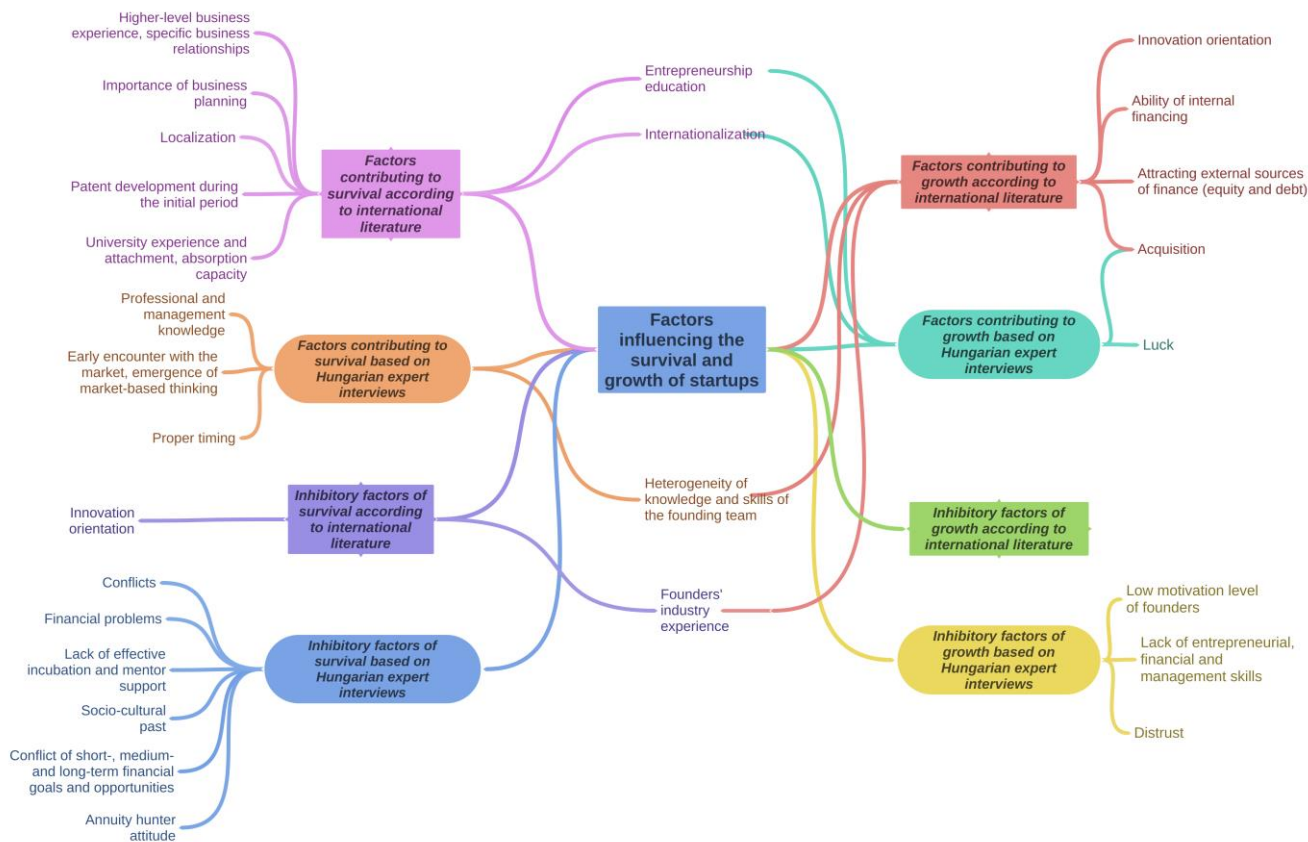
Figure 1: Concept map of factors influencing start-up survival and growth

Source: own compilation

We found little overlap between the international results and the factors identified by the Hungarian experts. The reasons for this can be rooted in both methodological differences and different historical backgrounds. The international results are mainly based on longitudinal quantitative research aimed at start-up companies in Western Europe and the United States, while in Hungary since the start-up ecosystem has not been around for long, the implementation of such research poses major challenges. The application of the qualitative methodology in our research involved a different viewpoint in the analysis, with several factors related to the peculiar Hungarian historical development, which may fundamentally determine the fate of Hungarian start-up companies. In addition to the differences, some factors have appeared in both international research and the expert interviews. Both in the international literature and the interviews with domestic expert's entrepreneurial knowledge gained through education and entry into the international market were mentioned as factors affecting survival and growth. These factors are not only interesting because they can be found in the international literature as well as in the opinion of Hungarian experts, but because both factors are identified in international literature as enhancing the survival of start-ups, while domestic experts believe they have a role in their growth.

The heterogeneity of the knowledge and skills of the founding team is also a factor mentioned both at the international and national levels. However, while international research highlights its significance in the growth process, domestic experts believe that diversity plays a more important role in survival.

The international results concerning the founders' industry experience are interesting because, although opportunity cost due to alternative employment harms survival, they can boost the company a lot during the growth phase.

The only identified factor that was depicted as having the same influence in both the international literature and the Hungarian expert interviews is the growth-generating effect of acquisitions.

Looking at the concept map, it is evident that while the factors collected from international literature are more positive, they highlight the factors contributing to the survival and growth of start-ups (we could not identify growth inhibitors in the processed international literature), domestic experts expressed criticism and shed light on the reasons for the high failure rate of start-ups and their low propensity to grow. The reason behind this may be the general dissatisfaction with the performance of Hungarian start-up companies, but the negative attitude may also be due to the influence exerted by the personal opinion and belief of the interviewers.

Despite our efforts to perform our research with the highest degree of accuracy and precision, our results are limited by several factors. There are significant differences in the methodology used in the processed international literature and our research. The strength of the qualitative approach used in our research is its validity, however, in terms of reliability, primarily due to the distorting effect of our own assumptions, it may be below that of quantitative studies.

The expert interviews revealed a number of factors specifically affecting the survival and growth of the domestic start-up ecosystem, the international extension of which could be justified only to the countries of the Central and Eastern European region. We consider the comparative study of the survival and growth factors of start-ups in countries with similar historical backgrounds to that of Hungary as a prospective future research direction. We are confident that, despite the limitations presented, our results will prove beneficial to both start-up ecosystem players and policymakers.

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László RADÁCSI, is a senior researcher at Department of Management, Faculty of Finance and Accountancy of Budapest Business School - University of Applied Sciences. He is the Vice Rector for Strategy and Innovation of the University. His research interest includes: sustainability management, SME & start-up ecosystems, family business.
ORCID ID: orcid.org/0000-0002-2334-9761

Judit CSÁKNÉ FILEP, is the Director of Research of Budapest LAB – Entrepreneurship Centre at the Budapest Business School. Her research interest includes: family businesses, family business governance, succession, start-ups, freelancers, entrepreneurial ecosystems.
ORCID ID: orcid.org/0000-0002-5902-5195

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HIGH PERFORMANCE WORK SYSTEM AND SUSTAINABLE DEVELOPMENT AMONG JORDANIAN SMES: KNOWLEDGE SHARING AS A MODERATOR

Zeyad Alkhazali [1], Khaleel Al-Daoud [2], Hareth Alshamayleh [3], Mazin Aledeinat [4]

[1,2] *Business School, Al-Ahliyya Amman University, Amman 19328, Jordan*
[3] *Strategic Planning and Institutional Identity Administration, King Faisal University, Alahsa 31982, Saudi Arabia*
[4] *College of Business and Economics, Qatar University, Doha 2713, Qatar*

*E-mail: [1]z.alkhazali@ammanu.edu.jo; [2]k.aldaoud@ammanu.edu.jo; [3]halshamayleh@kfu.edu.sa;
[4]mazen.aledeinat@qu.edu.qa*

Abstract: The aim of this study is to examine the relationship between high-performance work systems (HPWS), sustainable development, and knowledge sharing in small and medium enterprises (SMEs) in Jordan. In this study it is hypothesized that the ability, motivation, and opportunity (AMO) improving the human resource (HR) practices of SMEs leads to better organizational performance of their employees through the role of knowledge sharing moderation. The results of this study confirm the hypothesis of the causal relationship between AMO practice with sustainable development, and the hypothesis of AMO practice with sustainable development are influenced by knowledge sharing. This study has implications for practice and theory, also can help project managers from these organizations to plan better human resource management (HRM) practices to promote sustainable development through innovation and creative performance of their employees. Therefore, this is one of the first studies to discuss the HRM productivity in AMO practice, and its important role in knowledge sharing.

Keywords: sustainable development; innovation performance; high performance work systems; knowledge sharing

1. Introduction

Due to their growing competitiveness, SMEs face modern challenges in monitoring their assets and ensuring accurate information sharing between group individuals, which has prompted increased attention among organizational directors on the importance of effectively monitoring human assets on common premises to ensure that employees proceed to include an appreciation of the objectives of the organization (Jyoti and Rani, 2017;

(Turner and Ledwith, 2018). Human assets are one of the important resources of organizations of various types and segments.

Prado and Sapsed (2016) define SMEs as "organizations that serve clients, develop specialized projects such as systems development engineering, coaching, and organization and consulting, and create temporary arrangements and systems" (p. 1795).

Knowledge as a key competency for an organization that contributes to making organizational implementation progress and improvement sustainable (Santoro et al., 2019c). The development and improvement supported in today's knowledge -based society stems from the ability to disseminate knowledge (Vrontis and Christofi, 2019). The ability of employees to transfer knowledge to each other may be a key factor in making a difference for organizational implementation progress and for creating worthy progress (Santoro et al., 2019a).

While investigating writings on HRM practices and AMO practices, Pak et al. (2019) describe the development of existing writing on the efficiency and impact of HRM practices on AMO applications. For this reason, not being able to make accurate choices about the future to inquire or investigate openings cannot decide which mediation would be more beneficial for those in SMEs characterized by a chain of budget, quality, time and toll (Prieto-Pastor et. Al., 2018; Alkhazali et al., 2019). In development, there is no research on mediators and mediators on the relationship between AMO application and implementation of progress, especially in SME.

Therefore, the aim is to explore the impact of HPWS on sustainable development among SMEs using AMO practices. Next, to investigate the role of knowledge sharing in this relationship. This study uses a quantitative method with a survey approach and was conducted on employees working in SME Jordan. Moreover, this study contributes to the literature on HPWS (AMO practice), enhancing our knowledge of HPWS by conceptualizing support for the role of knowledge sharing interventions in supporting exceptional sustainable development through the innovative performance of employees working at SME Jordan.

2. Theoretical background

Research on sustainable development has long recognized key drivers and opportunities for progress (Santoro et al., 2018, 2019b; Portela, 2020). The basis of this victory variable is what we refer to as human progress administration, which appears to lead and organize improved individuals in SMEs (Bogers et al., 2018). Past research in the field of HRM has found a relationship between employee AMO practices and employment, using the focal point of AMO preparation, Appelbaum et al. (2000) emerged that organizations can have a positive impact on organizational performance by ensuring that all delegates have AMO practices to perform their work efficiency. Elbaz et al. (2018) defined competence as "the talents, knowledge, skills, competencies and experience required to complete a task" and motivation as "the desire (or level of motivation) to do so". The ability of a company to "create or acquire new knowledge and information, and then apply and assimilate that knowledge, is a function of the collective ability of employees to recognize, learn and share this knowledge" (Ferraris et al., 2017). Motivation in similar situations allows these employees to develop and expand this knowledge in cognitive communication and leads to better performance (Tho and Trang, 2015). The combination of AMO practices has been identified as important in enhancing organizational innovation. Messersmith and Guthrie (2010) describe development as the creation and expansion of modern administrations, items, and forms that contribute to the creation or increase of appreciation for an organization. Analysts use AMO practices to clarify the relationship between HPWS and sustainable development. It has been hypothesized and tested that HPWS enhances the capabilities, information, and capabilities of employees to give them the ability to improve in terms of performance. By implementing AMO practices, the organization energizes its representatives to demonstrate good performance with the help of engaging HRM practices.

Organizations also provide opportunities for their representatives to participate in the advancement of organizational objectives and approach progress, then empower them to create unapplied thinking that is the basis of organizational implementation. Although there has been extensive writing on HRM practices and innovation performance, analysts have ultimately sought to combine these two queries on flow (Alkhazali et al., 2020). The following areas offer some assumptions about the influence of encouraging communication and data trade between AMO practices and sustainable development for SMEs.

3. Hypothesis development

The ability, motivation, and opportunity improve HR practices and sustainable development
The impact of AMO practices on sustainable development with inventive outcomes within the created countries has been widely considered. Cabello-Medina et al. (2011) to establish an interface between the practice and development of HRM by taking cases from Spanish organizations with human and social capital divisions. Camelo-Ordaz et al. (2011) built a relationship between HRM practice and development implementation through knowledge sharing. A number of people think they have examined this relationship in an Asian setting. Alkhazali et al. (2020) found that HRM practices lead to superior development outcomes, which in turn lead to advanced implementation. Argote et al. (2003) highlighted the part of AMO practice and knowledge management in advancing organizational implementation. In their consideration, Turner and Pennington (2015) concluded that inspiration and opportunity are highly related to information trading, but their findings failed to establish a positive relationship between talent and data trading. In expansion, analysts such as Chowhan (2016) argue that the experience of creating HR capabilities encompasses a critical impact on organizational performance through the impact of organizational progress interventions. But in general, Jiang et al. (2012) found an important interface between AMO practices and organizational performance.
H1. There is a positive relationship between HPWS (AMO practices) and sustainable development among Jordanian SMEs.
H1a. There is a positive relationship between ability enhancing HR practices and sustainable development among Jordanian SMEs.
H1b. There is a positive relationship between motivation enhancing HR practices and sustainable development among Jordanian SMEs.
H1c. There is a positive relationship between opportunities enhancing HR practices and sustainable development among Jordanian SMEs.

The moderating role of knowledge sharing
The literature centers on the importance of knowledge sharing in organizations (Dezi et al., 2019), and the impact of knowledge sharing is poorly examined, information sharing has been linked to organizational performance outcomes as customer benefits increase, decrease in generation cycle (e.g., Ma et al., 2008) and feasible improvements (Papa et al., 2018b; Santoro et al., 2018). Knowledge sharing can be a key preparation in information management methodologies (Alkhazali et al., 2019) and has been examined at the people and organizational levels (Alkhazali et al., 2019; Ferraris et al., 2018). At the individual level, knowledge sharing is characterized by the extent to which employees share the information they obtain with others in the organization (Teh and Yong, 2011). These include open knowledge that can be collected and stored in the form of official records, and confidential information that is difficult to apply (Shah et al., 2007; Nonaka, 1994). If employees do not share their information with others, they will not be able to contribute to more pressing organizational interests when representatives turn to competitors (Ma et al., 2008) and in this way have little valuable information about themselves (Curado et al., 2017). Human resource management style, the transfer of innovation directly affects the sustainability of the company (Laužikas, Miliūtė, 2020; Laužikas et al., 2021).

Along with Shipton et al. (2005), HPWS empowers organizations and delegates to build successful and deliberate environments and platforms that consider near acquisition, acquisition and sharing of knowledge and play a role

in improving innovative performance. Wright et al. (2001) reaffirmed the role of HPWS in providing a robust culture where employees share their knowledge and in turn improve organizational performance.

According to Wang and Noe (2010), if AMO practices seek more grounded employee behavior, other delegates will benefit enormously from this knowledge, which can have a positive and critical impact on organizational performance. Thus, representative knowledge sharing behaviors incorporate a strong impact on organizational performance, because simple and explicit individual and organizational knowledge (Alkhazali et al., 2019) must be incorporated into organizational rules to value the organization. Agreed to ask about Curado et al., (2017) and Xue et al. (2011), this thinking uses a knowledge -based approach and uses repetitive and representative interest in knowledge exchange. Knowledge exchange is seen to be essentially related to organizational performance (Muduli and McLean, 2020).

H2: knowledge sharing moderates the relationship between HPWS (AMO practices) and sustainable development among Jordanian SMEs.

H2a. Knowledge sharing moderates the relationship between ability enhancing HR practices and sustainable development among Jordanian SMEs.

H2b. Knowledge sharing moderates the relationship between motivation enhancing HR practices and sustainable development among Jordanian SMEs.

H2c. Knowledge sharing moderates the relationship between opportunity enhancing HR practices and sustainable development among Jordanian SMEs.

4. Method

Based on an extensive review of the available literature, this study identified three independent variables: ability to improve HR practice, motivation to improve HR practice and opportunity to improve HR practice. The aspect of the study -dependent variable was sustainable development among Jordanian SMEs. In addition, moderator variables have been proposed to influence the relationship between independent variables and dependent variables. Essentially, the moderator used in this study was knowledge sharing. The relationships of these variables will all be examined against the assumptions of the case. Figure 1 below illustrates the schematic framework and the proposed relationship between the variables.
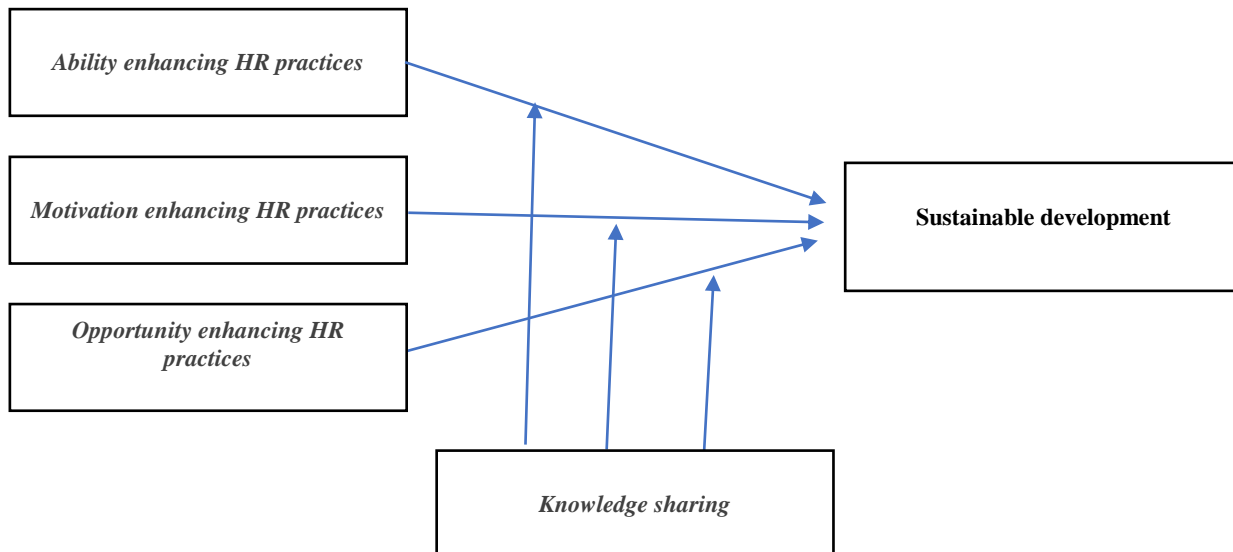
Figure 1. The Theoretical Framework of the Research

According to Figure 1, there are two alternative models that reflect the relationships described in the framework, which can be further enriched by testing the alternative models. The alternative models presented here serve as examples of possible relationships and explain the frameworks put forward when presenting the various hypotheses to be tested. This alternative model is often referred to in the literature as the "relationship" between HPWS (AMO practices) and sustainable development.

Based on the proposed framework, several sets of hypotheses are prepared. This hypothesis will forge a relationship between HPWS (AMO practices) and sustainable development, and will test the role of knowledge sharing proposed in this relationship.

5. Measures

This research uses survey research tools as its quantitative approach, known as appropriate data collection instruments. Each variable to be studied in this study is a continuous variable. This is HPWS (AMO practice), knowledge sharing as a moderation variable and sustainable development as a dependent variable (Zikmund et al., 2010).

Moreover, because of the suitability of quantitative research data with numbers, questionnaires are the best approach to collect data appropriate to these characteristics. This is more appropriate as this study is interested in capturing the opinions of SME Jordan employees. This indicates that the information expected by the respondents can be obtained from the individual's reflection on the reality of the workplace and its variations.

Population
The population includes all 14 five-star hotels in Amman which are: Millennium Hotel Amman, Le Royal, Bristol Hotel, Sheraton Amman AL-Nabil Hotel and Towers, Intercontinental Jordan Hotel, Crowne Plaza Amman, The Regency Palace Hotel, Holiday Inn Hotel, Kempiski Hotel Amman, Four Seasons Hotel, Landmark Amman Hotel, Le Meridian Amman Hotel, Amman Marriott Hotel, and Grand Hyatt Amman Hotel. The following hotel information and data were included in the study: Landmark Amman Hotel, Kempiski Hotel Amman, The Regency Palace Hotel, Le Meridian Amman Hotel, Holiday Inn Hotel, Amman Marriott Hotel, Intercontinental Jordan Hotel, Bristol Hotel.

Sampling and sampling method
Researchers studied 8 of 14 five -star hotels as a sample. The study consisted of a sample unit consisting of 176 front office employees; including front desk staff, reception operators, chief of staff, director of guest relations at the eight hotels previously reviewed; A total of 20 questionnaires were distributed in each hotel dated February 2020. 122 of these questionnaires could be used with a response rate of 69.3% for data collection purposes.

Researchers have made the previously mentioned hotels as examples of five-star hotels in Amman, as the HR department at other five-star hotels considers the required data to be confidential and states that disclosing such data is against hotel policy. These hotels are Crowne Plaza Amman, Four Seasons Hotel, Grand Hyatt Amman Hotel, Le Royal, Sheraton Amman AL-Nabil Hotel and Towers and Millennium Hotel Amman.

Proportional random sampling method to cover all hotels effectively, this sampling method also improves sample representation by reducing sampling errors. Additional analysis provides opportunities for data filtering and cleaning as well as control for unresponsive data, and some forms of data collection errors (Krejcie and Morgan, 1970).

In addition, items answering questions related to HPWS (AMO practices), knowledge sharing, and sustainable development were included in the questionnaire section. The development of survey instruments is guided by the

relevant literature, and adaptations to relevant items in the past, if appropriate. A standard 5 -point Likert response evaluation scale was used to measure dependent variables, independent variables, and moderate variables.

Coefficient of determination (R2)

In addition to suitability and importance assessments, another relationship assessment measure in the PLS-SEM model is the R-square phase assessment or determinant factor (Hair et al., 2014). R^2 is a measure of model prediction accuracy, calculated as the rectangular correlation between the predicted endogenous construction and the actual value (Hair et al., 2014). The value of R^2 reflects the combined effect of exogenous latent variables on latent endogenous variables (Hair et al., 2010; Hair et al., 2014). The values of R^2 for the endogenous variables of the direct link model are shown in Table 1 below.

Table 1. Coefficient of Determination (R-Square)

Endogenous variable	R-square
Sustainable development	0.75

Chin (1998) suggested that R^2 values of 0.67, 0.33, and 0.19, respectively, were considered important, moderate, and weak, or rejected in PLS-SEM modeling. Table 1 of the exogenous latent constructs in this study (i.e., HPWS (AMO practice)) illustrates 75 percent of the variance in sustainable development. Following Chin's (1998) suggestion, the value of R^2 described is very close to a large influence. This suggests that 75 percent of sustainable development depends on the independent variables considered in this study. The remaining 25 percent can be explained by other factors.

Hypotheses testing for direct relationships

The first step to test the direct relationship hypothesis is to run the PLS algorithm, which allows the researcher to create path coefficients to determine the relationship between the independent and dependent variables in this study. The second step is the opener string to make a value of t to check the importance of this relationship, there are various suggestions on how the opener string can be used. For example, Hair et al. (2013), shoelaces can be run with 500 sub-patterns, Hair et al. (2014) recommended 5,000. This work was published by Hair et al. (2014) used 5,000.

The results of the structural model of this study based on the direct relationship between the independent variables and the dependent variables are shown in Table 2 below. These results were interpreted using road connection coefficients (Beta), standard error (SE), t values (T statistics) and P values.

Table 2. Structural Model Output for Hypotheses Testing

Hypotheses	Relationship	Path coef.	Stan. erro.	T Stat.	P valu.	Comm.
H1	…	…	…	…	…	…
H1a	AHR -> SD	0.189	0.053	3.568	0.000	Accept
H1b	MHR -> SD	0.197	0.051	3.593	0.000	Accept
H1c	OHR -> SD	0.188	0.054	3.549	0.000	Accept

Assessment of the effect size for direct relationships

In addition to estimating the R^2 value of a model -dependent variable (e.g., sustainable development), changes in the R^2 value are used when a particular independent variable is removed from the model to assess whether the variable is eliminated. on the variables that depend on latent sustainable development. This dimension is called the impact dimension (Hair et al., 2014). The magnitude of the effect is determined by the relative effect of a given independent variable on the dependent variable based on the change in the value of R^2 due to the

reduction (Chin, 1998). As a result, the effect size was measured by Cohen's formula (Hair et al., 2014; Cohen, 1988).

given as:

$$F^2 = \frac{R^2 included - R^2 excluded}{1 - R^2 included}$$

Formula 1. F-square value

Where:

F^2: is the F-square value that determines the effect size of a specific independent variable on the dependent variable.

R^2 included: is the R^2 value of the dependent variable before omitting a particular independent variable.

R^2 excluded: represents the changes in the R^2 value of the dependent variable after excluding a particular independent variable from a model.

Based on the Formula 1, the F^2 values of 0.02, 0.15, and 0.35, indicates small, medium, and large effects respectively (Cohen, 1988).

Table 3. Assessment of the Effect Size (F-Square)

Independent variables	$R^2 incl.$	$R^2 - excl.$	Effect size
AHR	0.748	0.650	0.388
MHR	0.748	0.654	0.373
OHR	0.748	0.691	0.226

Table 3 is the result of a large -scale evaluation of the effect of each independent variable on the dependent variable. The direct relationship is that all independent variables that have a significant influence on the dependent variables have moderate and large effects on sustainable development.

Hypotheses testing for moderating effect
In this study, the effects of knowledge sharing moderation were tested in the relationship between HPWS (AMO practices) and sustainable development. Table 4 shows the findings of the moderate effect test.

Table 4. Results of Moderating Effect Test

Hypotheses	Relationship	Coef.	T-valu.	P-valu.	Level of sig.	Comm.
H2	…	…	…	…	…	…
H2a	KS* AHR -> SD	0.121	3.658	0.002	***	Accepted
H2b	KS* MHR -> SD	0.087	2.437	0.035	**	Accepted
H2c	KS* OHR -> SD	0.291	0.979	0.385	-	Rejected

Table 4 shows the results of hypotheses examining the moderate effects of knowledge sharing on the relationship between HPWS (AMO practices) and sustainable development. In the PLS-SEM analysis, a knowledge-sharing effect exists if the interaction path is significant, meaning that the t-statistical effect of the interaction must be 1.64 or 1.96 and above to be significant using one or two tails each (Hair et al., 2010).

6. Discussion and conclusion

The relationship between HPWS (AMO practices) and sustainable development
The HPWS high -performance work system (AMO practice) as a success factor in relationship management has a positive impact on sustainable development among Jordanian SMEs, as expressed in hypothesis H1 (H1a, H1b, and H1c). The results of this correlation, as reported in Table 3, were at a significance level of 0.001, with band coefficients (AHR 0.189, MHR 0.197 and OHR 0.188), T-statistics and P values (AHR was t = 3,568 (P <0.000),

MHR is t = 3.593 (P <0.000) and OHR is t = 3.549 (P <0.000)). These results indicate that HPWS (AMO practice) is considered to be the most important determinant of sustainable development.

The effects of HPWS (AMO practices) on sustainable development are Influenced by the knowledge sharing

The effect of knowledge sharing moderation on the relationship between HPWS (AMO practices) and sustainable development, as expressed in hypothesis H2 (H2a, H2b and H2c). These results support the hypothesis as shown in Table 4, at a significance level of 0.001 (AHR is Coef = 0.121, t = 3.658 (p> 0.002), MHR is Coef = 0.087, t = 2.437 (p> 0.035) and OHR is Coef = 0.291, t = 0.979 (p> 0.385)).

These findings indicate that the effect of knowledge sharing moderation on the relationship between HPWS (AMO practices) and sustainable development is significant. However, according to Hair et al. (2010), H3c both t-statistics and p-values were insignificant. Therefore, the H3c hypothesis, which states that knowledge sharing moderates the relationship between opportunities to improve HR practices and sustainable development is not accepted.

This paper highlights the complexity of management tasks and recommends that Jordan take a knowledge sharing perspective. Resources can be provided by lecturers, staff and SME who require an interactive approach that integrates these resources. If the proposal is implemented to realize the vision of the future, Jordan will benefit.

Future research may be based on the following considerations: increase the research population by covering the entire SME sector. Alternatively, take evidence from other industries and increase the number of observations using larger sample sizes and longer data periods. The relationship between HPWS (AMO practices) and sustainable development can be further explained if the researcher subsequently conducts research by including additional variables, including other dimensions of knowledge sharing in terms of SME perceptions and operations. Changing knowledge sharing from a moderate variable to an intermediate variable or even an independent variable can also change outcomes and relationships. As SMEs are still growing in Jordan, performance appraisals should be conducted from time to time to take corrective action if necessary.

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Zeyad ALKHAZALI
ORCID ID: https://orcid.org/0000-0001-8693-6253

Khaleel AL-DAOUD
ORCID ID: https://orcid.org/0000-0003-2318-2735

Hareth ALSHAMAYLEH
ORCID ID: https://orcid.org/0000-0002-9588-1028

Mazin ALEDEINAT
ORCID ID: https://orcid.org/0000-0002-9487-0773

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*FACTORS INFLUENCING COMPANIES' POSITIVE FINANCIAL PERFORMANCE IN DIGITAL AGE: A META-ANALYSIS

Ludmila Kasperovica [1], Natalja Lace [2]

[1,2]*Faculty of Engineering Economics and Management, Riga Technical University*
6 Kalnciema Str., Riga, LV-1048, Latvia

E-mails: [1]ludmila.kasperovica@rtu.lv ; [2]natalja.lace@rtu.lv

Abstract. The article summarizes the factors that affect the company's positive financial results in the changing business environment in the digital age. Upon the qualitative and quantitative analysis of the literature, 33 dominant financial and nonfinancial factors were selected, which the authors emphasized as important for the development of a sustainable, profitable business. To assess the practical impact of the selected factors on the company's profit generation, the data were grouped and interpreted through the prism of the Universal Business Model (BM), applying it either to BM as a whole or to its dimensions - the value proposition dimension, the value creation dimension and the value capture dimension. At the end of the article, empirical examples were considered, specifically, the digital transformation of the business model of two companies under the influence of modern supporting drivers. Both examples indicate that a successful BM transformation can only be achieved by transforming all related components of the BM dimension into their interaction. By collecting and accumulating this information, a profit management model can be developed to support companies in a rapidly changing environment, especially in the small and medium business sector.

Keywords: business ecosystem; business model; digital platforms; digital transformation; disruptive innovation; pricing strategies; profitable business model; service-dominant logic; service platform.

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1. Introduction

In a dynamically changing business environment, it is becoming increasingly difficult to identify the factors that affect a company's positive financial performance and, consequently, sustainable development. In the current research, as a result of the analysis of literature sources, the dominant factors were revealed, which the authors emphasized as important in supporting a profitable business. The identified factors can be split into groups that affect the financial, nonfinancial, digital and nondigital spheres of activity. The set of discovered factors in the interaction create a condition for a positive business financial result.

Research is one of the key drivers of nonfinancial support. By conducting research, the company recognizes in a timely manner the innovations already discovered in its field of activity, as well as innovations that can come from a completely different unrelated field and operate on the existing business as a disruptive (revolutionary) innovation. Certain business ecosystems are dominant in nonfinancial digital factors. In turn, the exchange of services in the ecosystem is not effective without service platforms. Ecosystem actors form partnerships and alliances by synchronizing both self-created platforms and data from third - party platforms (Dehning, Richardson & Zmud, 2003; Ekundayo, 2019; Nosratabadi, Mosavi & Zavadskas 2019; Seelos & Mair, 2007) collecting and allocating resources in this way, as a result of their effective interaction, the partners increase sales (Dehning, Richardson & Zmud, 2003) as well as social, environmental, and economic benefits at the same time (Dehning, Richardson & Zmud, 2003).

The composition of financial factors suggests that revenue growth is a key factor in retaining profits (Dehning, Richardson & Zmud, 2003; Seelos & Mair, 2007). Increasing profits in practice are also often seen as cost savings and, above all, a reduction in fixed costs through digital adoption. In turn, the authors emphasize that maintaining a sustainable profitable business can only be achieved by combining the implementation of several strategies for making a profit. Profit maximization is the ability of a company to increase revenues through more efficient use of resources (Ekundayo, 2019).

In addition to the above, the research also looks at other driving factors that support the achievement of a positive financial result of the business.

The authors analyze the practical impact of selected factors on the company's profit generation by interpreting the selected factors through the universal Business Model (BM) prism, applying them to the BM dimensions - value proposition elements (products, sales channels, pricing policy and customer communication), value creation dimension or value capture dimension. As a result of the research, it was concluded that the creation of a viable and profitable BM in the digital age is possible only by the interaction of all BM elements, under the influence of several supporting driving factors. It is important to reveal the importance of each BM element in order to timely abandon old, no longer profitable value elements and to reduce the resources used as a result of the value chain, as well as to add new innovative BM elements.

In the concluding part of the article, the results of the study were illustrated with two comparative empirical examples: transformation of business models for companies operating in social entrepreneurship in the Latvian market, related successes, implementation shortcomings and recommendations for future development of companies.

2. Methodology

The qualitative and quantitative review of the scientific literature was performed to conceptually understand the factors that contribute to positive business results (profits) in the digital age.

In the first step, a qualitative review of relevant independent scientific research was performed, with the aim to select possible factors relevant to the research topic. Using the Internet search queries and keywords "the profitable business model" 26 literature sources were selected; from these, the 12 most relevant sources were identified for the further in-depth study. In the course of the research, additional keywords were discovered: digital transformation, service platform, service-dominant logic, disruptive innovation, and pricing strategies. As a result of additional search queries, an additional 46 literature sources were selected. Of these, 18 sources were identified as the most relevant for further in-depth analysis. When selecting literature sources, a restrictive time criterion was set, starting from 1990 - the period of time related to the arrival of the Internet. In addition, in the mid-1990s, the first theories about the concept of the business model emerged. Only in the middle of the first decade of the 21st century, a significant number of publications on this subject appeared. In turn, the number of documents on digital transformation has been published later, their number starts to increase significantly only after 2014 (Reis, Amorim, Melao & Matos, 2018).

The authors performed an analysis of a total of 30 literature sources on which the research conclusions were made with the following outcomes: the number of articles that were published in 1990 was one (0.33%), in the period from 2000 to 2009 - were 7 (23%) and in the period 2010 – 2019 - were 22 articles (73%). The archives of online scientific publications (www.researchgate.net, www.academia.edu, www.ijsrp.org, and others) have been used to select articles to obtain reliable sources of peer-reviewed and academic research. Scientific articles were selected from the most published and cited authors. To determine the significance of the selected factors, in the context of the research topic, the selected factors were grouped into categories and using the statistical meta-analysis methods, the frequency and proportional weight of each category was determined in the context of the research question.

In the second step, to understand the practical impact mechanism of the selected categories on profit formation, they were grouped and considered through the prism of the BM. During the qualitative analysis of the selected literature, theoretical assumptions were made about how the selected factors could contribute to the positive financial result of the business.

In the third step, the theoretical assumptions were tested by analyzing the success and shortcomings of innovative activities implemented into the practice of the two companies.

3. Literature review

3.1. Factors influencing companies' positive financial performance

During the literature analysis, three categories were created, which reflect the modern factors, which the authors of the reviewed sources have emphasized as important in creating a sustainable, profitable business. Based on the qualitative and quantitative content analysis of the sources, the most common factors influencing the positive results of the business are summarized in Table 1. The table also notes how often these factors are mentioned in the sources studied. The selected factors are grouped into three categories. Factors influencing digital innovation are grouped together in the nonfinancial digital category, which includes the following groups (adopted from (Schallmo, Williams & Boardman, 2017). Digital Networking capabilities, Digital Development, Digital Data, and Automation. Other nonfinancial factors belonging to the "quality of business organization" and results from "disruptive innovations" are grouped into nonfinancial nondigital category. In turn, the financial category includes the factors through which profit strategies are implemented by improving the revenue / cost structure.

Table 1. Summary of factors that influence a positive business outcome

Categories	Group	Factors	Times mentioned in sources
Nonfinancial digital (NF-D)	Digital networking capabilities	Partnership and alliances	13
		Ecosystem	8
		Digital networking	7
		Third-party digital platform	5
		Online sales channels	4
		Own services digital platform	4
	Digital development	Digital literacy of a company's employees	6
		BM digital transformation	6
		Digital maturity	4
	Digital data	Decision making through a data prism	7
	Automation	Automation	3
Nonfinancial digital factors - 11			**67**
Nonfinancial nondigital (NF-ND)	Quality of business organization	Research and development	9
		Dynamic Technological Progress	8
		Recognition of existing innovations (adopting solutions from other business models)	7
		The time effect of innovation implementation	6
		Outsourcing	5
		Unique product	2
		Product quality	2
		Innovation at the multi-dimensional level	1
		Customer feedback	1
		Social impact	1
	Disruptive innovation	Service-dominant (SD) approach	9
		Lower-priced products for low-end market	3
		Competitive threats from outside industry boundaries	3
		Convergence of physical products and digitalization	2
		A more sustainable, innovative and expensive products	2
		New-market disruptive products	1
Nonfinancial nondigital factors - 16			**62**
Financial (F)	Revenue items	Revenue growth as a determining factor	5
		New pricing conceptions	3
	Cost position	Cost savings through digitization	5
		Transformation of fixed costs into variable costs by digitization	4
	Financial result as a whole	Reducing costs by increasing or maintaining revenue	10
		Limited time to make a profit	3
Financial factors - 6			**30**
Grand total factors - 33			**159**

Source: Authors

The set of factors combined in the nonfinancial digital category has been assigned the greatest importance in developing a profitable business in the digital age. The frequency share of nonfinancial digital category is 42% in the composition of the selected categories; the nonfinancial nondigital category, which combines other supporting factors, makes up 39%, while financial factors make up 19%.

3.1.1. The nonfinancial digital category.

Within the nonfinancial digital category, the most frequently mentioned group of factors was the Digital Networking capabilities. It was mentioned 41 times in the sources. The second most Frequently mentioned group was the group of Digital Development factors, which were mentioned 16 times in the sources. As for the group of Digital Data, factors were mentioned 7 times in the Sources and the final group of factors included in process automation were mentioned 3 times. Figure 1 shows the structure of the nonfinancial digital category.
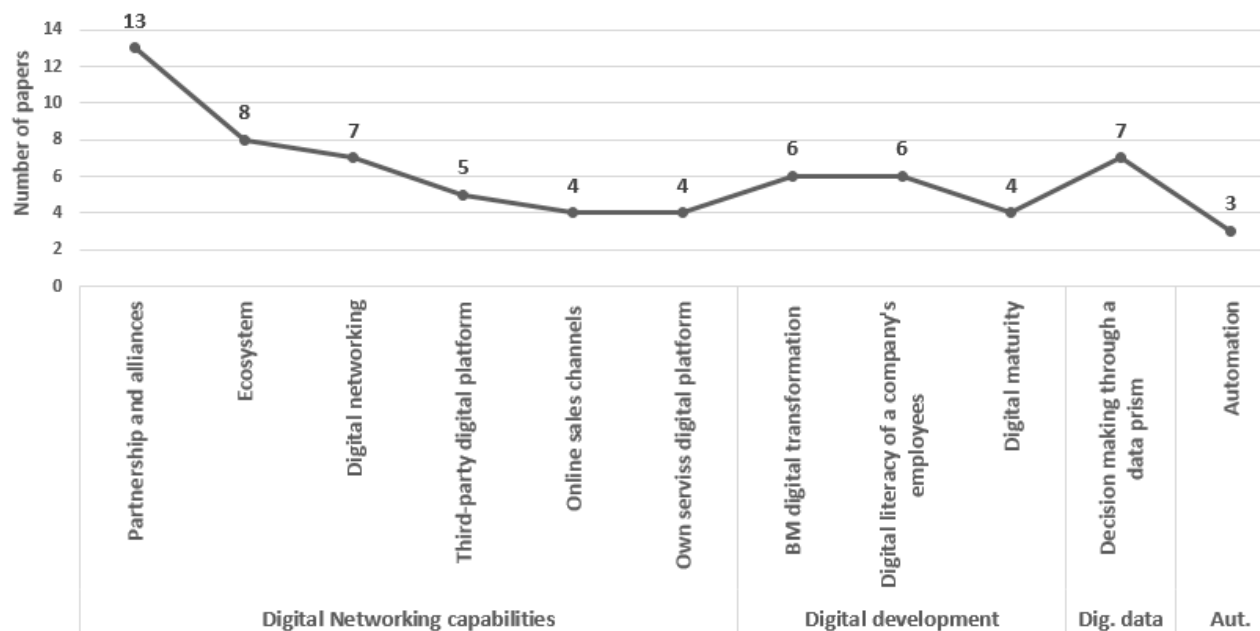
Figure 1. Frequency of nonfinancial digital category factors appearing in the literature.
Source: Authors

The digital impact on the business environment has been around since the 1990ies of the 20th century. The development of IT technologies and the advent of the Internet offered people new opportunities that were difficult to recognize because traditional stereotypes were broken. The advent of the Internet has transformed human behavior and communication, moving several physical things to the virtual environment. The Internet and ubiquitous digitization are more than just another additional technology, they are qualitatively new, powerful means of communication. The Internet has both improved the speed of information collection and made a significant amount of information widely available (Lumpkin & Dess, 2004).

The following are the groups of key digital factors that affect the business environment, which were selected from the main sources:

Digital Networking: The Digital communication network creates new business communications both to customers, expanding the opportunities to present their products, as well as expanding and facilitating product

ordering opportunities for both suppliers and other partners (Köhler, 2008; Mikusz, 2017; Raymond, Bergeron, Croteau, & St-Pierre, 2016) thus, creating a business ecosystem. The business ecosystem consists of individuals, organizations, and public authorities, as well as rules that ensure the company interacts with customers, competitors, media, and others (Lusch & Nambisan, 2015; Seelos & Mair, 2007). One company can be part of several ecosystems, whose members are also its partners, suppliers, and customers. However, the exchange of services in the ecosystem is not effective without a service platform that helps to collect and distribute resources as a result of their effective interaction (Lusch, & Nambisan, 2015). Platforms bring together several consumer groups and create value only on the basis of mutual interest of consumer groups. Using a two-side network effect, the value of a platform increases if the platform satisfies the demands of both parties, while the number of users in the network increases (Eisenmann, Parker, & Van Alstyne, 2006). Modern technologies (Cloud Computing, broadband, sensor technology) help companies to build both their own platforms and to use third-party platforms (Paulus-Rohmer, Schatton, & Bauernhansl, 2016). For instance, the Alibaba platform helps small and medium-sized businesses to adapt to the rapidly changing rules of the digital world (Li, Su, Zhang, & Mao, 2018) by allowing them to go beyond the local market and enter the international market. By synchronizing data from different platforms, the participants of the ecosystem form partnerships and alliances (Dehning, Richardson, & Zmud, 2003; Ekundayo, 2019; Nosratabadi, Mosavi & Zavadskas 2019; Seelos & Mair, 2007) increasing sales (Dehning, Richardson, & Zmud, 2003) as well as acquiring social, environmental and economic benefits at the same time (Nosratabadi , Mosavi & Zavadskas 2019). For example, publishers use website traffic from other publishers to boost their popularity (Viljakainen, Toivonen, & Aikala, 2013). All value-added mobile or wired networks using high-speed broadband telecommunications enable the synchronization of supply chains, which reduces production time and innovation cycles (Schallmo, Williams & Boardman, 2017).

Digital development: Digitalization is a new source of business model innovation that contributes to greater corporate competitiveness and profit growth for individual companies (Dehning, Bruce, Vernon J. Richardson, 2003). The main goals of digital transformation (DT) are to obtain new data and use this data to restore old processes (Schallmo, Williams & Boardman, 2017). New tools and technologies are used in the business model DT. These tools require new staff knowledge in the data collection, processing, calculation, and evaluation process (Dehning, Bruce, Vernon J. Richardson, 2003; Remane, Hanelt, Nickerson, & Kolbe, 2017; Weill, Subramani, & Broadbent, 2002). The introduction of new technologies can fail if the company has not developed a proper business culture. The key question is whether the company recognizes that there is a dramatic difference between digital maturity and market development today (Kane, Palmer, Phillips & Kiron, 2016).

Digital data: The collection, processing, and analysis of digitized data facilitates and enhances management, forecasts, and decisions when developing a profitable business (Schallmo, Williams & Boardman, 2017). Digital transformation transforms a business organization from the process definition to the data flow management concept (Kane, Palmer, Phillips & Kiron, 2016; Schallmo, Williams & Boardman, 2017). New state-of-the-art analytics tools, which are integrated into a company's business model, offer extensive opportunities for data analysis (Köhler, 2008) by providing information about products, customers, and organizational units (Christensen & Raynor, 2003). For example, the analysis of the data in the pricing policy allows to establish a suitable markup, which significantly increases the profit with a small increase in prices of a significant volume of goods without losing the market size (Mazouni, 2013). The reports generated by the application of the data obtained from the third platform provide information on customer behavior and product demand (Li et al., 2018). All new data generates new knowledge and provides an opportunity not only to make the business more effective, but also to replace manpower resources with automation, thus significantly reducing costs (Dehning, Richardson, & Zmud, 2003; Schallmo, Williams & Boardman, 2017).

Automation: Automation represents a combination of classical artificial intelligence technologies, which enable to perform autonomous operations and create self-organizing systems. This reduces the number of errors, increases speed, and reduces operating costs (Schallmo, Williams & Boardman, 2017).

3.1.2. Nonfinancial and nondigital categories

The goal of a business is to obtain a return on investors' capital investment in the short, medium, and long term by deploying resources efficiently. Managers also have the task of generating value from nonfinancial capital, which is employees, brands, natural resources (IIRC & KIRCHHOFF INVESTOR RESEARCH REPORT) as well as operational activities such as quality, meeting project deadlines, timely delivery (Fullerton & Wempe, 2009). The digital environment and the nonfinancial digital factors described above directly affect the quality of the business organization and management methods.

Within the nonfinancial and nondigital category, the selected factors were categorized in two groups – Quality of Business Organizations and Disruptive (revolutionary) Innovation. Figure 2 shows the structure of the nonfinancial nondigital category, in which the factors of business qualitative organization were mentioned 42 times in the sources, while the factors of disruptive (revolutionary) innovations were mentioned 20 times.
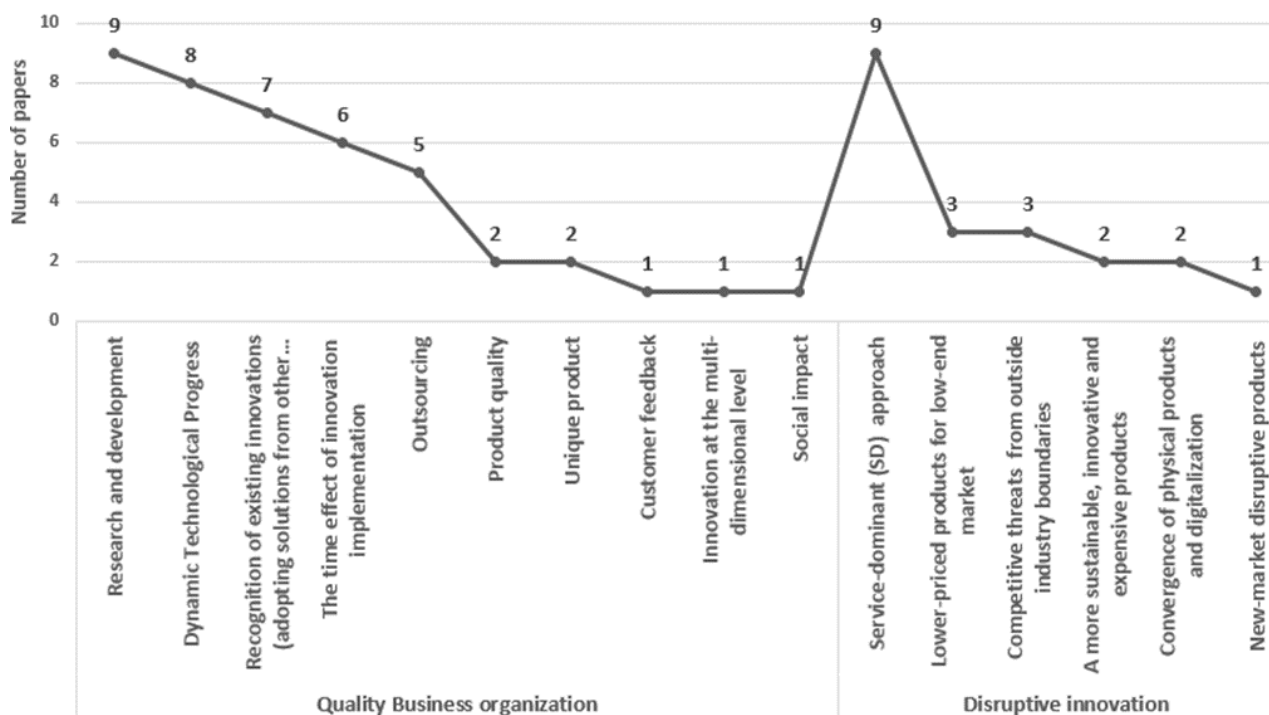
Figure 2. Frequency of nonfinancial nondigital category factors appearing in the literature.
Source: Authors

Quality of business organization: Research has been identified as one of the most crucial drivers of business development. Companies invest in research directly by creating knowledge and by adapting existing innovations to their industry (Cohen & Levinthal, 1990; Mikusz, 2017; Raymond, Bergeron, Croteau & St-Pierre, 2016). The impact of dynamic technological progress requires regular enhancement of the company's BM to sustain positive financial outcomes (Linder & Cantrell 2001). By modifying their BM, companies, adopt the BM solutions of other enterprises, combining them and introducing innovative changes at the level of various dimensions (Linder & Cantrell 2001; Remane, Hanelt, Nickerson, & Kolbe, 2017), thus, creating a unique product (Paulus-Rohmer, Schatton, & Bauernhansl, 2016). Thanks to digital platforms, the customers and partners of companies have the opportunity to establish mutual cooperation, which contributes to the creation of the uniqueness of products and boosts the quality of existing products (Linder & Cantrell 2001). The product uniqueness and quality are

supported by customer feedback. The innovative development of BM must be conducted in conjunction with tasks and decision-making that are related in a logical way and in a specific time context. The key success factors that affect the viability of each implemented project are time, finances, and quality (Christensen & Raynor, 2003).

Disruptive innovations: Innovative development can work in two ways, for example, in pertinence to innovation in enterprise sustainable development by improving existing products that can be sold at higher prices and attracting more customers, or by disruptive innovation (Joseph, 2018). Disruptive innovation offers an alternative to existing products that are much cheaper and simpler to use, and partially or fully replace existing products. Disruptive innovations do not try to create better products; they introduce new products that are not currently available on the market (Christensen & Raynor, 2003; Linder & Cantrell 2001). At the same time, while for one business, it can be a disruptive innovation, for another one it can be productive as it can promote sustainable development (Joseph, 2018). Strategic changes in an industry today often come from a completely different industry and lead to a change in cooperation policy and competition rules. Digital technologies have had a significant impact on the economy, altering the way companies interact with each other, with customers and other partners. They have created not only an innovative environment in which companies operate at a higher level, such as faster, cheaper, smarter levels, but also, they have created many new business opportunities (Lumpkin & Dess, 2004).

The innovative approach to market expansion no longer supports traditional market segmentation methods, the main attributes of which are the product and the customer, but focuses on the conditions in which customers are located rather than on the customers themselves (Hackos, 2003) and on the benefits as a final result (Hackos, 2003; Mikusz, 2017). This approach proposes the design of a new business model based on a service-dominated approach (Ekundayo, 2019; Fullerton & Wempe, 2009; Hackos, 2003; Kotarba, 2018; Linder & Cantrell 2001; Malmmose, Lueg, Khusainova, Iversen, & Panti, 2015; Mikusz, 2017; Viljakainen, Toivonen & Aikala, 2013).

The ability of an organization to transform the customer's anticipation in the data into the development of the product or service for which the customer will pay (Ekundayo, 2019; Viljakainen, Toivonen & Aikala, 2013), because his/her anticipation will be fulfilled and facilitated by the service dominant logic (S-D logic) (Mikusz, 2017) and product servicing. S-D logic refers to two distinct types of resources— operand and operant. Operand resources are usually tangible and static resources that require some action to make them valuable, e.g., a vehicle. Operant resources on the other hand, are usually intangible (Hackos, 2003) and dynamic resources that are capable of acting on operands and other operant resources, e.g., knowledge. According to S-D, logic, this value can result only from the application of operant resources that may be directly transmitted or through operand resources. This means that when physical goods are involved, they are understood as mechanisms for service provision (Mikusz, 2017). The impact of nonfinancial and nondigital factors on business organizations has a direct effect on the financial outcomes of a business.

3.1.3. Financial categories

Figure 3. shows the structure of the financial category and the authors assign the greatest importance to reducing costs through the introduction of digitization, where this factor is mentioned in 10 sources. "It is important to reduce costs to maintain or increase the turnover" - the factor is mentioned in 5 sources. "Revenue growth" is mentioned as a determining factor in 5 sources. It is also crucial to create an efficient cost structure and to use new approaches in pricing policies and the changing digital environment, given the limited profit margin.
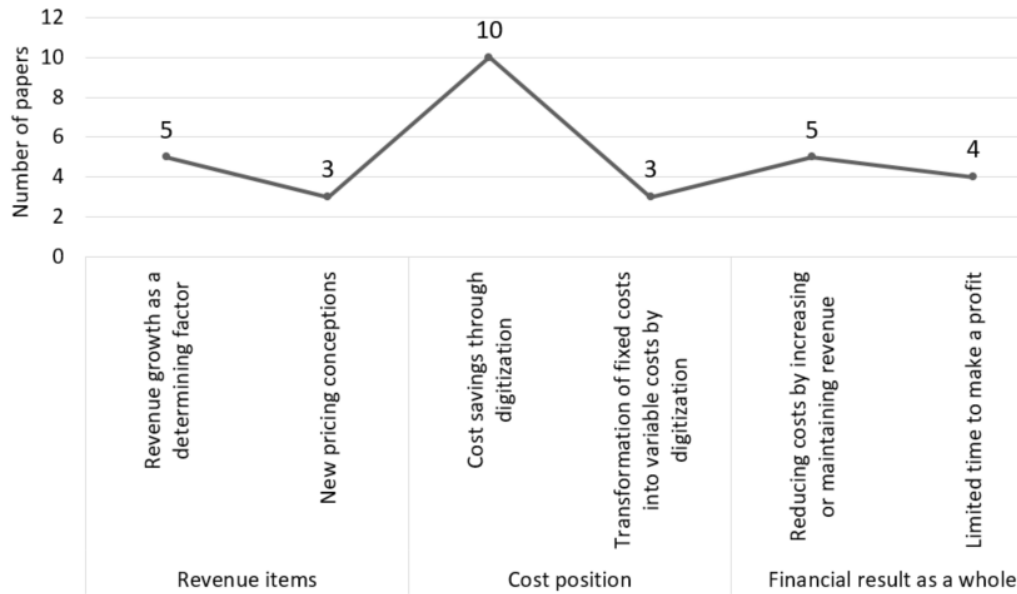
Figure 3. Frequency of financial category factors appearing in the literature
Source: Authors

Revenue items: In the financial and economic fields, there is a strong destructive trend in terms of revenue generation: using the service / product only when the customer needs it. BM, in which the share of income is generated from sources that have not been pertinent to their primary supply so far (Amit & Zott, 2012; Kotarba, 2018). BM's design is based on the service-dominant approach, in which customers are analyzed as co-creators of value rather than as sales targets (Fullerton & Wempe, 2009; Mikusz, 2017). Revenue growth continues to be emphasized as a key factor in sustaining profits (Dehning, Richardson, & Zmud, 2003; Seelos & Mair, 2007), which is why when planning business success strategies, the authors recommend the simultaneous development of multiple revenue sources targeted at both the affluent and the lowest consumer levels (Christensen & Raynor, 2003; Seelos & Mair, 2007). A common way to increase revenue is to generate revenue from the sale of large volumes of low-priced items (Viljakainen, Toivonen & Aikala, 2013). This technique is widely used in information product sales strategies. Additionally, the pricing policy of informative products envisages a wider price range: by adding a variable component to the fixed price component, which depends on the volume of use of the service, without limiting the usage time (subscription fee) or the creation of the dynamic pricing policy by adding additional value to the basic product (Kotarba, 2018; Viswanathan & Anandalingam, 2005). The above pricing policy is also applicable to the supply of various other products, such as tourism, insurance, and other sectors.

Cost items: The authors mention cost reduction as one of the fundamental directions of the contemporary approach and the reduction of fixed costs is seen primarily with the introduction of digitization (Dehning, Richardson, & Zmud, 2003). In turn, to achieve an efficient cost structure, it is necessary to work on the replacement of operational fixed costs with variable costs (Paulus-Rohmer, Schatton, & Bauernhansl, 2016; Schallmo, Williams & Boardman, 2017). Outsourcing, the use of virtual workers and robotic process are the method of adapting costs to changing workloads (Hackos, 2003; Köhler, 2008).

Financial results as a whole.

Limited time to make a profit: Dynamic technological progress is forcing companies to innovate in BM through research. Introducing innovation allows for higher profits as long as it does not turn into regular practice

(Dehning, Richardson, & Zmud, 2003). Under the influence of destructive innovations and as a result of the digital transformation of the business model, it must be taken into account that the profit-making mechanism also operated according to the new formula (Christensen & Raynor, 2003). As far as possible, strategies should be chosen that yield positive financial results quickly, but investments with long-term returns today mean the wrong strategy (Christensen & Raynor, 2003).

Reducing costs by increasing or maintaining revenue: Increasing profits in practice is often seen as reducing costs, but still maximizing profits is the ability of a company to maximize profits by increasing revenue through more efficient deployment of resources (Ekundayo, 2019). It is advisable to achieve the optimal cost / income ratio by assessing efficiency gains (achieving a better end result) rather than just looking for ways to reduce costs as such (Viljakainen, Toivonen & Aikala, 2013) (recommended the increasing of efficiency through effectiveness instead of making efficiency primary).

Under the influence of digital transformation, several factors are involved in the value creation: operational efficiency, cost reduction, competitive advantage, improved service delivery, enhancement of relationship with all stakeholders, co-creation of product value (Morakanyane, Grace, & O'Reilly, 2017), thanks to the digital platform and ecosystem opportunities, and a range of other factors that contribute to a positive business financial outcome.

3.2. Creation of meta-categories: grouping of selected factors and their interaction according to the structure of the universal business model

To assess the practical impact of the selected categories on the company's profit generation, the data were grouped and interpreted through the prism of the Universal Business Model.

Researchers from different fields of research have recognized the potential of business models to promote the competitive advantage of companies (Clauss, 2017). Using the theoretical and universal structure of the business model description, it is easy to capture, understand, and share, observe over time, measure, and shape the business model (Osterwalder & Pigneur, 2002).

Currently, there is no generally accepted definition of the term "business model". Thomas Clauss (Clauss, 2017), summarizes definitions given by scholars, considers business models as templates of how companies run and develop their businesses at holistic and system levels. Many scholars consider that a business model integrates three main business dimensions – the value proposition, value creation, and value capture (Clauss, 2017). BM is a conceptual tool that incorporates a set of elements, their interactions and reflects the business logic of each specific company (Osterwalder & Pigneur, 2002). The value proposition dimension includes a set of solutions for a company's customers (Clauss, 2017) and determines who the company's customers are, what products they offer, who the main consumers of the product are, what pricing policies will be, product distribution channels, and marketing activities. The value creation domain defines how and by what means enterprises create value along the value chain (Clauss, 2017), using specific resources and competencies. Value capture includes financial (Clauss, 2017) and, from the authors' point of view, nonfinancial aspects. The financial aspect of the value capture dimension determines how the value proposition will be translated into revenue, what the cost structure, and profit generation mechanism will be, while the nonfinancial non-digital aspect offers a set of support drivers that contribute to a company's positive financial performance. Creating a viable and profitable BM in the digital age is plausible only through the interaction of all BM dimensions, combining and adapting different profit strategies (Köhler, 2008).

Determining the impact of the above 33 selected supporting factors (see Table 1) on the positive financial performance, the previous researches most often attribute to BM as a whole 5 financial and 12 nonfinancial nondigital factors, which together make up 53% of the total number of the mentioned factors. In pertinence to the value proposition, there apply 8 factors, 25%, whereas 7 factors, 22%, are attributed to the value creation (Figure

4). In turn, the number of sources distributes the proportion differently and the share of factors attributable to BM as a whole is 63%, to the value proposition 16%, and to the value creation 21% (Figure 5).
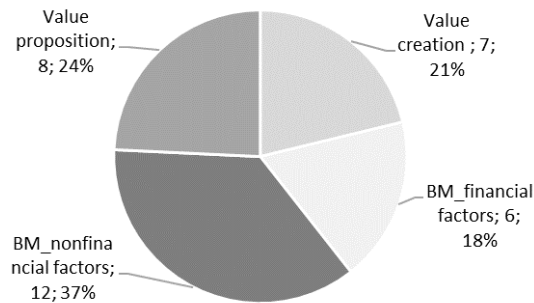
Figure 4. Proportion of factors attributable to business
model dimensions
Source: Authors
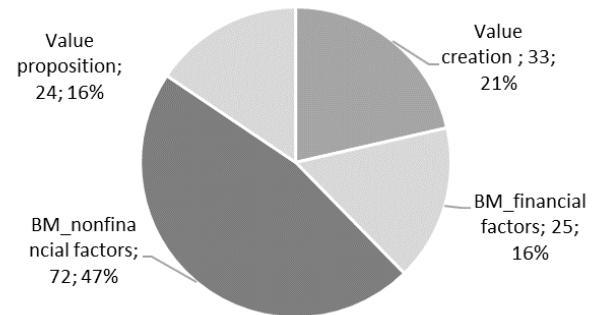
Figure 5. Proportion of sources attributable to business
model dimensions
Source: Authors

According to the structure of the universal Business Model (BM), Figure 6, Figure 7 shows the support driver factors within the value capture dimension as well as the influence and interaction with the BM value proposition and value creation dimensions.
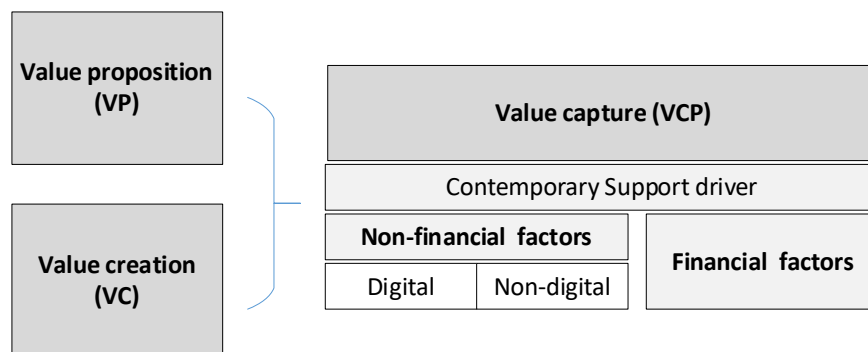
Figure 6. Structure of the universal Business Model.
Source: Authors

Value capture (VCP)			
Contemporary Support driver			
Non-financial factors			**Financial factors**
Impact to VP and VC dimension	Total Impact to BM		
Value proposition (VP)	*Digital factors* - Online sales channels *Non-digital factors* - A more sustainable, innovative and expensive products - Unique selling points - Service-dominant approach - Interactive effect of physical products and service offerings convergence - Discount prices at the low end of the market - Customer feedback	*Digital factors* -Business model digital transformation -Digital networking -Ecosystem partnership and alliances -Own services digital platform - Third-party digital platform *Non-digital factors* -Adopting solutions from other business models -Dynamic Technological Progress - Competitive threats from outside company traditional industry boundaries -Innovation at the multi-dimensional level -Research and development -Social aspect	*Revenue items* -New approaches to pricing policy -Revenue growth as a determining factor *Cost items* -Transformation of fixed costs into variable costs by digitization -Cost savings through digitization *Financial result as a whole* -Limited time to make a profit -Reducing costs by increasing or maintaining revenue
Value creation (VC)	*Digital factros* - Company Digital maturity - Automation -Digital literacy of company employees - Decision making through a data prism *Non-digital factors* - The time effect of innovation implementation - Outsource and products quality		

Figure 7. Structure of the universal Business Model with value capture support driver factors
Source: Authors

Business model innovation is more than just product, service, or technology innovation. Innovation occurs when several dimensions of a business model are transformed to provide value in a different way (Gassmann, Frankenberger & Csik, 2014). Digitization is a new source of business model innovation; therefore, it contributes to boosting the greater competitiveness of the company. The term "transformation" is used to determine the degree of strategic change in business as a result of innovation (Goerzig & Bauernhansl, 2018). The concept of digital transformation has been discussed for many years, but the digital transformation of the business model is still under discussion. Current issues include how to digitally transform business models and what tools should be considered (Schallmo, Williams & Boardman, 2017).

During the transformation of business models, there is a choice of what to do with the old value proposition and how to be able to make a breakthrough in generating revenue from the new channels. There are two ways to balance this task:
- to find an own strong competitive advantage and develop its existing BM by improving it;
- to identify new customer needs in today's environment and create a start-up business that will become a source of future revenue by further integrating it into the core business structure (Gilbert, Eyring & Foster, 2012).
Organizational strategy is no longer limited to the company's internal views, but focuses on the business environment, the ecosystem (Lusch & Nambisan, 2015). Today, managers need to perceive themselves as part of an organism that operates in the business ecosystem. The ecosystem is not based on the main company; different companies can operate in the same ecosystem, adapting their different business models by developing the ecosystem (Zott & Amit, 2013). Digital deployment and service-dominant approach (SD logic) also include possible integration with partners (Schallmo, Williams & Boardman, 2017), common value creation, and resource

integration. Value proposition is an intermediary in the continuous interaction between value creation and resource integration (Fullerton & Wempe, 2009).

The company's ability to recognize new external knowledge, acquire, transform, and use it for its commercial purpose is very important for BM's innovative transformation.

4. Business Model Transformation: Two Empirical Examples

The section discusses empirical examples of two BM transformations for companies operating in the social business environment in the Latvian market, related successes, implementation shortcomings, and recommendations for the future development of companies using modern support drivers.

The first phase looks at the company's BM before starting DT. The second phase will look at the transformation of BM design influenced by the combination of factors discussed in the previous sections in relation to the dimensions of the business model and their elements, as well as the impact of BM transformation on the company's financial performance. In the third phase, implementation shortcomings are addressed and recommendations for future development are provided. The considered phases of BM transformation are shown in Figure 8.
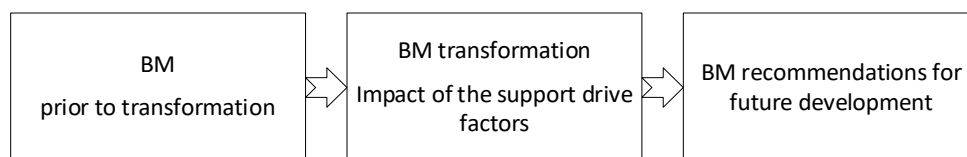
Figure 8. BM transformation phases of companies
Source: Authors

4.1. BM transformation of the company Ltd. "Home care"

Operating in the market since 2001, the company provides a wide range of social services, such as professional assistance to families in need of care for the elderly, sick or minors with special needs in their places of residence, thus making people's daily lives easier. Entrepreneurial social objective is to ensure a person's right to live as independently as possible in his or her usual family environment, to ensure that a person does not feel lonely or helpless. The company offers and provides its services mainly in the territory of Riga City Municipality, providing social care services to an average of 400 clients every month. Services are provided at the expense of the municipal budget. In total, the company employs more than a hundred qualified employees (carers, nurses, social rehabilitators, nursing assistants, and social workers).

In 2018-2019, as a result of the BM transformation, the care services business has been expanded and the existing services have been improved in two areas, specifically, the "Assistive Technology Center" has been established, and the virtual care services have been provided. The idea of setting up an assistive technology center is not new in the world, as this type of centers, which offer a variety of aid types, and the latest technologies to improve the quality of life and movement and adapt the environment for people with disabilities, have become very popular in the US, Canada, Scandinavian countries, etc.

The term "assistive technology" (hereinafter referred to as AT) includes (1) assistive adaptation and rehabilitation devices for people with special needs. Modern assistive technologies promote greater independence by allowing people to perform tasks they have not been able to accomplish in the past. At present, people with special needs do not have access to this type of technology centers in Latvia, where information on the latest technologies and

opportunities would be available and which would offer consultations of professional specialists on them, and would offer the opportunity to purchase or rent them.

The virtual care service is an innovative e-health solution and by expanding its operations, the company has invested in a virtual care cloud solution on the Finnish company VideoVisit platform (the virtual development business has been rapidly developing and the leaders on the market, such as the Finnish company "VideoVisit", website: www.videovisit.fi), the American company "Camanio Care" (website: www.camanio.com) regularly invest in research and development (R&D) and innovative solutions in cooperation with industry professionals, universities and partners from other countries. The solution is based on a digital service platform that covers the entire virtual healthcare chain, combining all necessary digital healthcare tools in one platform; it can be used by customers without prior technological experience. Clients receive a virtual consultation with a healthcare professional or doctor, receive reminders (for example, consume medicine, measure blood pressure, etc.), as well as tasks (for example, show examples of exercises, etc.). Customer feedback, which is collected on the company's own online website, helps the company to assess the virtual reality and regularly improve the content and quality of the service.

Figure 9 shows the company's BM before the transformation, driving nonfinancial factors supporting the BM transformation, which were summarized and described in the previous sections, and finally the BM that has already been improved after the transformation.

Figure 9. Ltd. "Home care" BM transformation
Source: Authors

The financial aspect of value capture, influenced by the BM transformation, is reflected in Figure 10. The company's turnover increases average by 15% every year, while profitability varies from 0% to 1%.
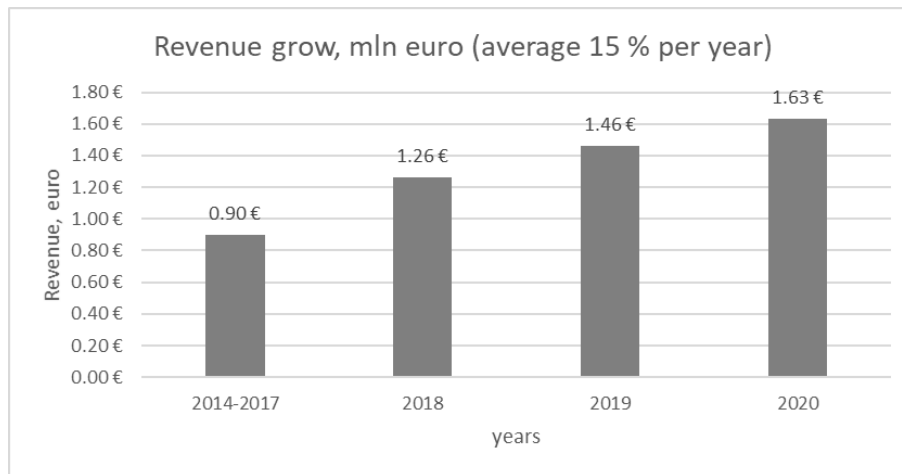
Figure 10. Ltd. "Home care" Revenue grow
Source: Authors

As a result of the BM digital transformation, the range of service users has expanded, and in addition to local government funds, the financial resources of the private sector have also been attracted, the territory of service provision has expanded, and new cooperation partners at the international level have been found. In performing the BM transformation, the company successfully applied nonfinancial factors: product servicing, research and recognition of existing innovations, and product uniqueness on the existing market. Side industry practices have been adopted, expanding the range of services, offering more expensive and advanced and sustainable products, applying new pricing policies, combining several services into one offer. Regular subscription services have been introduced on the digital platform, which also includes the collection of customer feedback. Within the framework of nonfinancial digital factors, third-party digital platforms have been used, digital communication networks and digital sales channels have been created, and automation has been offered, providing modern equipped assistive aids. The revenue growth factor has been considered as the dominant financial factor.

The whole set of these measures ensured a regular increase in turnover, but did not ensure a stable positive financial result. To create a profitable sustainable BM, the second step, according to the authors, should include the creation of an efficient cost structure and reduction of costs with the introduction of digitization

4.2. Implementation of the BM transformation project in the company "Svaigi lv"

The company "Svaigi, SIA" was founded in 2015. "Svaigi.lv" provides a professional approach to the sale of products of Latvian small farm and home producers, offering an innovative sales tool - the e-commerce virtual platform "Svaigi.lv" with the aim to ensure that high quality food is available to customers via modern online shopping. Thus, small farms and home producers in Latvia have received the opportunity to sell their products regularly and independently. Small farms lack the professional knowledge and resources to create product packaging and labeling of high quality, arrange product supply logistics, as well as determine the needs of customers, and create their own marketing activities. Small farms in the region do not have access to outlets or have restrictive conditions for products; the cooperation agreements with supermarket chains have strict terms and conditions, and therefore, practically unfeasible, so the products of small farms cannot be found on supermarket shelves. Through the "Svaigi.lv" platform, business owners can offer a wide assortment of their products, and the products are available to customers to order 7 days a week.

E-commerce is an area that is still being formed and developing in the world, and "Svaigi.lv" as one of the few food online stores in Latvia has to develop dynamically over time. This implies constantly questioning the chosen business model, whether it supports the maximum possible sales volume, and whether it is sustainable. Researching the examples of good practice in the development of e-commerce in the world, "Svaigi.lv" has concluded that in the dynamically changing digital business environment, where the product life cycle is rapidly decreasing, to maintain competitiveness potential, it is necessary to promptly identify, adapt and use innovative solutions for commercial purposes. The contemporary innovative e-commerce business models support the use of digital platforms, information, and communication technologies. The value of a platform increases if it ensures that the demands of all parties involved are met.

In 2018, a three-year project was launched, which envisages the enhancement of BM in accordance with the innovative trends of the dominant service concept, specifically, it envisages the usage of digital opportunities and world-proven e-commerce business models aimed at co-creating product value, service subscriptions, as well as developing new sales channels for corporate clients. Prior to the implementation of the project, the transaction ends with the delivery of the ordered product to the customer, while the commercial goal is to attract customers for long-term cooperation and promote repeated purchases in a convenient way for the customer. A modern concept that transforms Product Dominant Logic into Customer Thinking Oriented Logic (Service Dominant Logic) helps a company integrate additional service solutions into its BM.

Customer integration in long-term service relationships is based on value co-production. To continue contact with the customer after the delivery of goods, it is planned to create a "customer's cabinet" within the "Svaigi.lv" platform, which allows the customer to manage their orders, payment flow, as well as provide feedback on the quality of goods and services. In its turn, "Svaigi.lv" uses this opportunity to offer the customer service subscription cooperation model, which is more commercially advantageous compared to the existing cooperation model.

Based on the data obtained from business transactions, the customer's behavior, their needs, and satisfaction can be assessed. The evaluations of suppliers provided by buyers make it possible to predict which products the customers choose daily and to what extent these products will be needed in a certain period of time, thus, it allows to offer product subscriptions for a certain period. In addition, data analysis facilitates cooperation with business owners, allowing to forecast the required order volumes in advance, to assess the quality of the provided services and products. To ensure the exchange of information and resources in co-production, it is planned to create a "host cabinet" within the "Svaigi.lv" platform, which allows hosts to manage order flows and volume, billing statuses and forecasted product quantities, see reviews of their products, administer not only their product subscriptions, but also evaluate the service at every step.

Digitalization opens up a wide range of opportunities for a company to standardize business processes, to make them as simple and efficient as possible, and to ensure that it maintains a competitive position by increasing profits. The project envisages the establishment of data exchange between the e-commerce platform and the financial system, which allows for saving costs on data processing and ensures high-quality coordination and control of the business. Figure 11 shows the company's BM before the transformation, driving nonfinancial factors supporting the BM transformation, which were summarized and described in the previous sections, and the improved BM after the transformation.
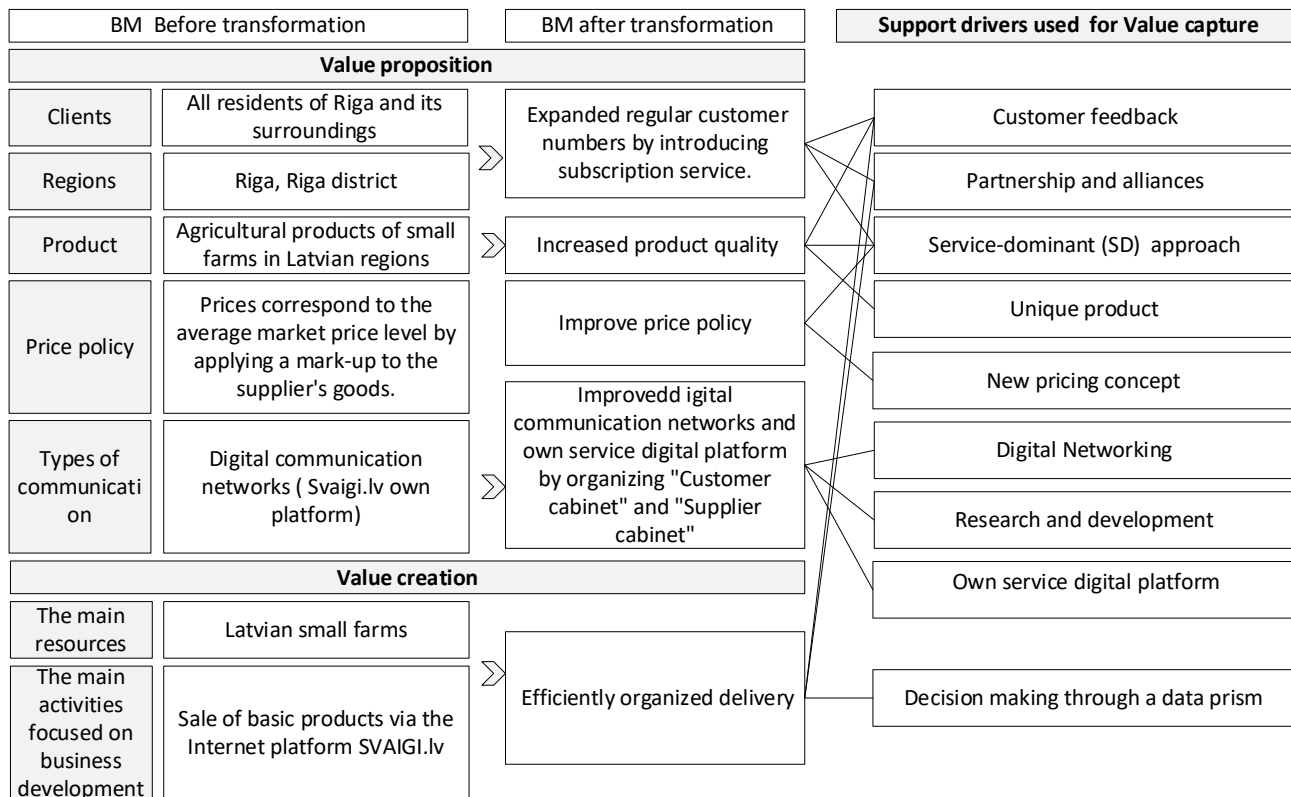
Figure 11. Ltd. "Svaigi.lv" BM transformation
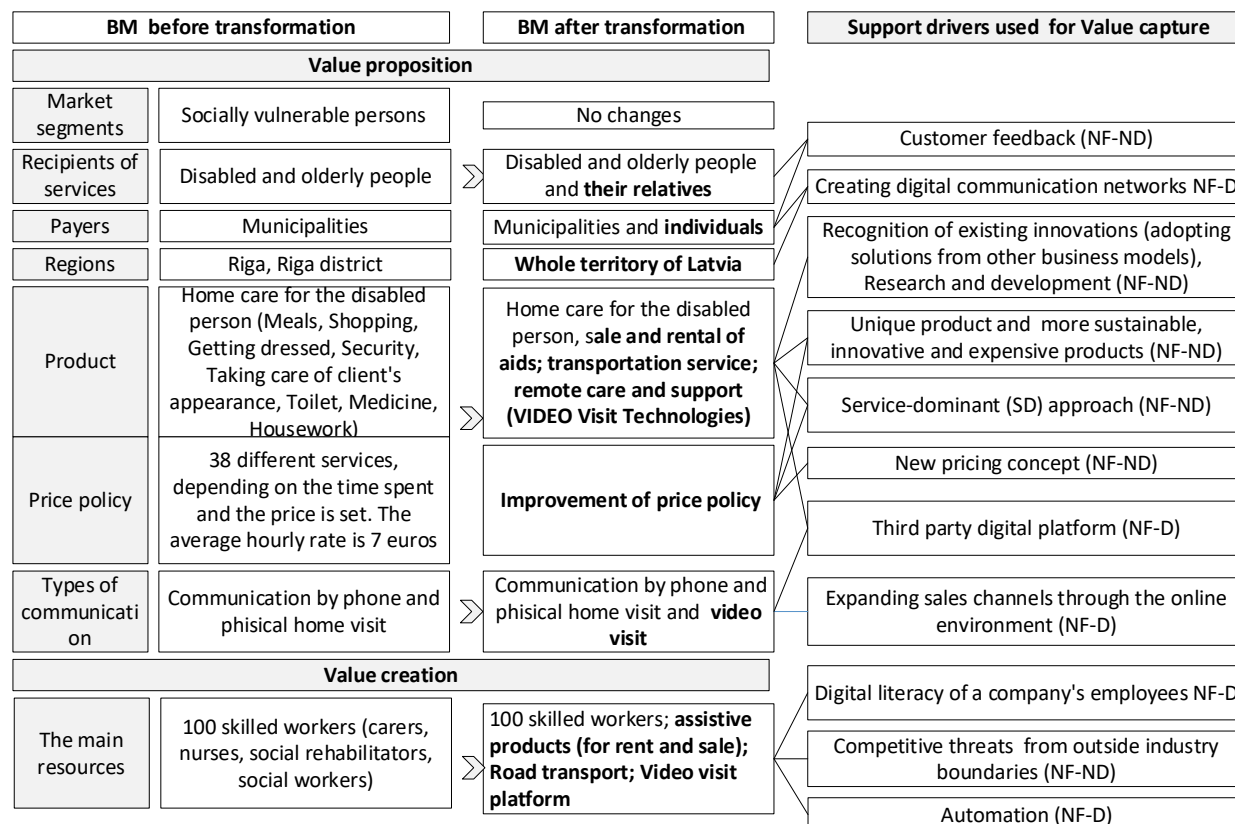*Source: Authors*

The financial aspect of value capture under the influence of BM transformation is shown in Figure 12. The company's turnover increases every year, with a further planned annual growth of 15-20%. On the other hand, the company has not yet managed to achieve a positive financial outcome and is operating at a loss.
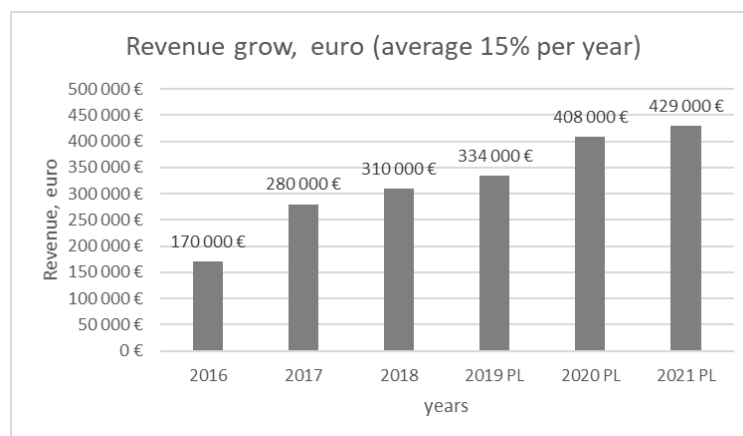
Figure 12. Ltd. "Svaigi.lv" Revenue grow
Source: Authors

As a result of the project implementation, the service-oriented business model of the virtual market "Svaigi.lv" will be transformed. Product servicing will transform the content, structure and management of transactions, achieving the company's goal to offer a unique business model in Latvia, developing cooperation with customers from a one-time purchase to long-term mutually beneficial cooperation. It envisages that once a person makes a decision about the need for products in his/her daily life and enters the payment data, he/she is further relieved of constant decisions about making a purchase and making a payment.

In performing the BM transformation, the company has successfully applied nonfinancial factors: product servicing, research and recognition of existing innovations, product uniqueness on the existing market; introduced regular subscription services on the digital platform and uses customer feedback; within the framework of nonfinancial digital factors, the company has applied the improvement of the self-created digital platform, established a digital communication network, ensuring the formation of partnerships aimed at co-creation of product value, expanded digital sales channels; introduced decision making through a data prism. The increase in revenue is considered the dominant financial factor; during the project implementation it is planned to carry out cost reduction activities by introducing digitalisation.

It is planned that the implemented project will allow to ensure the sustainability of the business by promoting the annual growth of turnover, but the digital management of processes will ensure a positive financial result (profit). As a result of the project implementation, it is planned to increase the number of business owners using the platform by 20% annually and to ensure the increase in revenue by an average of 15% per year and to ensure a profitability of at least 10%.

Conclusions

Within the framework of this paper, there have been identified the current profit-promoting factors in the changing business environment. The following groups of factors of the nonfinancial digital category are marked as dominant: "Digital data" (Digital data), "Automation", "Digital Communication Network" (networking) and "Digital Development". Several factors of "Business Quality Organization" are also addressed, and the factors of the "Impact of Destructive Innovations" is singled out, while "Financial Category" is taken to include factors through which profit strategies are implemented to enhance the revenue / cost structure.
The practical impact of the mentioned factors on the company's financial outcomes is possible to determine by interpreting them through the prism of BM and creating a conceptual tool that includes a set of elements of their interaction, which reflects the business logic of each particular company.

The study of two empirical examples showed that it was precisely these factors that supported the digital transformation of BM. Both examples also indicate that a successful BM transformation can only be accomplished by transforming all related elements of the BM dimension, such as the value proposition, value creation, and value capture via their interaction.

Profit maximization is the ability of a company to maximize profits by increasing revenues through more efficient use of resources. In turn, the financial results of both examples showed that companies initially supported only one dominant factor of profit maximization: revenue growth as a determining factor and achieve an increase in turnover. However, in the case of both examples, what was different was setting up cost-effective structures and reducing costs through the introduction of digitalisation, as the companies were still operating at very low profitability or at a loss.

In the following work, the authors intend to study in more depth the impact of the nonfinancial factors of the BM value capture dimension on the positive financial outcome of a business and the integration of these factors into the chosen profit strategies. By collecting and accumulating this information, a profit management model can be developed to support companies in a rapidly changing environment, especially in the small and medium business sector.

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Ludmila KASPEROVICA
ORCID ID: 0000-0002-5245-1423

Natalja LACE
ORCID ID: 0000-0003-1154-839X

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FINANCIAL ASSUMPTIONS OF SLOVAK MUNICIPALITIES FOR THEIR ACTIVE PARTICIPATION IN REGIONAL DEVELOPMENT[*]

Katarína Liptáková [1], Zuzana Rigová [2]

[1] *Faculty of Political Science and International Relations Matej Bel University, Kuzmányho 1, 974 01 Banská Bystrica, Slovakia*
[2] *Faculty of Economics Matej Bel University, Tajovského 10, 975 90 Banská Bystrica, Slovakia*

E-mails:[1]katarina.liptakova@umb.sk; [2]zuzana.rigova@umb.sk

Abstract. Local self-government, represented by municipalities, is not only obliged to ensure all competencies set by legislation, whether original or transferred, but also to play an increasingly important role in the economic development of entrusted territory. One of a key challenge of the municipalities is also to act as an activator of development, either independently by using their own financial resources or in cooperation with potential investors who want to start new, whether social or economic activities in the respective area. Based on the published studies, the authors looked for suitable indicators to evaluate the financial conditions of Slovak municipalities to participate actively in the regional development of a particular region. They evaluated financial data of municipalities not only from the perspective of eight Slovak regions, but also in terms of size categories of municipalities, since they want to find out, how individual size categories of municipalities contribute to the healthy and viable financial condition of considered regions. In terms of analysis, a high degree of territorial fragmentation can be observed in Slovakia, which in the case of small size categories of municipalities (up to 3,000 inhabitants) negatively affects their ability to participate in regional development, because they have worse financial and property conditions. The athours ealuate quantitative financial and demographic data on Slovak municipalities for the period between 2014 and 2018, which they obtained from the Slovak DataCentrum and Ineko websites.

Keywords: municipality; regional development; financial conditions; indicators of financial creditworthiness

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1. Introduction

There have been significant socio-economic changes in recent years. All these transformations have a significant impact on the role of territorial units in each country, their importance has increased. This can be seen through the fact that regional development responsibilities and competencies are transferred to local institutions. The question of regional development is not the government's question more.

For local development processes, a significant actor has become a municipality as a self-governing territorial unit possessing its own assets, financial resources, human potential and legislatively defined competencies. Municipalities have gained this position through decentralized and democratization processes, which have resulted in a reinforcement of the self-management of governance. It brings also a growing responsibility and powers of management of the entrusted territory (Žárska, Ferčíková, 2014).

The municipality needs a tax system that provides many opportunities for local governments to generate revenue that supports their plans, goals, and desired development patterns and their ability to adapt to changing local economic conditions (Develop tax policies that strengthen communities and the region). The municipalities have quite large competencies in imposition and administration of the tax (Vartašová, Červená, 2019). Tax policy is an important tool that the municipality can use for its further development, which can be also applied for regional development of whole territory, too (Papcúnová, Hudáková, 2019).

Tax policies have a broad impact on the ability of local jurisdictions to provide services and keep infrastructure in a state of good repair. Individual municipal revenues depend on land use mix, size of the tax base, and state and local tax structure. Tax policies of local governments can be interdependent (Baskaran, 2013).

Municipalities today face demands to increase the efficiency and accuracy of local tax collection. In an environment of financial deficits and the shift of public service securing to the local level, these challenges becoming greater in size. The key challenge for the administration of municipalities in Slovakia is to ensure their ability to meet their obligations and responsibilities (Liptáková, Rigová, 2020).

Local taxes represent one of the important revenues for municipalities. The municipalities increased tax rates in order to strengthen own revenues and the budget structure. Incomes from local taxes serve mostly to cover current expenses (Gál, Tóth, 2015). However, they are usually inadequate, they are not sufficient to cover the development needs of municipalities.

The problem with local taxes is the low tax capacity of a large number of municipalities. Small municipalities cannot make effective use of local taxes. Insufficient tax base and inability to secure additional income lead many municipalities to cover more than half of their budgets in terms of personnel costs. Instead of development activities, self-governing structures are actually financed, which raises the question of whether the primary role of self-government is to take care of the entrusted territory or to take care of oneself (Klimovský, 2014).

The aim of our work is to evaluate the financial conditions of Slovak municipalities by means of suitable indicators that express the basic prerequisite for the participation of the municipality in the process of regional development. The authors assume that the financial preconditions of the considered municipalities are insufficient. This situation is even worse in the case of municipalities of small size categories compared to municipalities of the larger size categories. Analysis and results were processed in MS Excel application.

2. Theoretical framework of the researched topic

Municipalities play an important role in regional development. The municipality is generally the lowest administrative unit with the status of self-government, which is subordinate to national, regional and European legislation.

Municipality is an independent self-governing territorial unit which unifies citizens with permanent residence on its territory (Tej, 2011). Municipalities are defined as the basic units of territorial self-administration and regions have been introduced as higher territorial units. Both regions and municipalities are territorially and administratively independent and are also independent from each other (Slovakia Fiscal Powers, 2019).

In the Slovak Republic, a municipality is a legal entity managing its own assets and financial resources (own revenues as well as state subsidies) under the conditions laid down by the law Act no. 369/1990 Coll. on Municipalities. In our perception is the municipality a city or settlement that has corporate status and local government.

Local authorities in all parts of the world play an increasingly important role in the provision of essential basic public services. The main responsibilities of local governments include maintenance of the local road network and public spaces, public transport, water and sewage systems, public order and safety, basic education and municipal housing policy (Hudec, Urbančíková, 2004). The municipality provides a large number of services: wastewater collection and disposal, waste disposal, electricity and gas supply, municipal health services, municipal communications and rainwater drainage, street lighting, municipal parks and recreation. Municipalities decide their financing (Jenčová, Litavcová, Štefko, Maťovčíková, 2013).

Small municipalities generally have a problem with tax revenues, as they depend to some extent on the balance of solidarity and transfers from central budgets. This is reflected in the low efficiency of local public services and high administrative costs (Šebová, Petríková, 2015). Communities whose incomes are low in relation to their needs seek to finance general operations and infrastructure by raising tax rates, which further discourages commercial and residential development. It can be a significant burden for low-income residents. Greater state investment in these communities is an integral part of improving their fiscal health and overall region prosperity (Develop tax policies that strengthen communities and the region).

The municipal authorities are responsible for providing and financing the original and delegated competencies in Slovakia. The original competencies are financed from internal and transferred competencies (e.g. basic education) from external sources through targeted grants, which reduce the degree of financial autonomy of municipalities. The European Charter of Local Government affects the financial relations between central and local public authorities. It regulates that local communities must be funded by the state in such a way that they are able to effectively meet the public needs of the local population and increase the well-being of society as a whole. The central government in Slovakia does not send sufficient resources to local governments for the transferred competencies, which they exercise on behalf of the state; therefore, their local governments from their own resources subsidize them. This is not in line with the European Charter of Local Self-Government and its basic principles. Despite the comparable scope of competencies with other EU countries, the share of local government expenditures in Slovakia is only at the level of approximately 17.2% of public sector expenditures (the EU average is 23.1%). This is the reason why local taxes in many Slovak cities increased significantly in 2019 (Sloboda, 2019).

The financial autonomy of the territory is one of the important characteristics, including the right to sufficient resources and the responsibility of local authorities in their formation and using. Financial independence is directly linked to the creation and realization of the financial potential of the territory (Boronos, Plikus, 2015).

Local governments have an important level of autonomy in deciding on local finances. Local funding is one of the important factors affecting various aspects of local development.

Slovak municipalities have these main types of revenues (since 1993):

- local tax revenues (real estate tax, share on centrally collected taxes - shared taxes),
- non-tax revenues (administrative fees, other fees, credits, grants from state budget, other non-tax revenues),
- revenues from municipal property and from property of the state in municipal administration (Buček, 1997).

Local taxes are the most important source of local finance.

Local tax is a tax levied by a local authority, such as a county, or municipality in the form of property taxes and is used to finance a wide range of civic services from waste collection to sewerage maintenance. The amount of local taxes may vary greatly between jurisdictions (Kagan, 2018).

Local taxes are one of the special groups of tax revenues collected by municipalities in Slovakia. They are designated by their municipalities and flow directly into their budgets. Taxpayers are residents of the city or citizens who visit it (Gál, Tóth, 2015).

Local taxes according to Act no. 582/2004 Coll. on Local Taxes and Local Fees for Municipal Waste and Small Building Waste as amended include: real estate tax, dog tax, public space tax, accommodation tax, vending tax, gaming machine tax, tax on entry and residence of motor vehicles in historical parts of towns, nuclear installation fees and local development charges. It is up to the municipality whether to introduce a tax or not. Municipalities are free to choose depending on their requirements, size, number of inhabitants and quantity of public goods and services provided. They also have the right to administer these taxes, to set tax rates and the subject of the tax or to decide on exemption from payment. Larger municipalities usually collect all local taxes.

In addition to local taxes, self-government has the right to impose and collect fees for other general municipal services, particularly through imposing user fees to support specific services and infrastructure (Taxes in Slovakia, 2016). The local fee for municipal waste and small construction waste is the only mandatory local tax imposed by the municipality in Slovakia.

Shared taxes (today only personal income tax, formerly corporate income tax) change almost every year in Slovakia, according to the State Budget Act.

Yields from municipal property, profit from municipal enterprises and organizations, yields from financial investments, income from municipal bonds are important sources of municipal revenues (Buček, 1997). Revenues from municipal property are significantly affected by the extent of ownership rights to property and depend on the activity of the municipality (Sedláková, 2012).

Municipality finances the needs of inhabitants mainly from its own revenues, state subsidies and other additional resources as loans from banks. Its tasks may also be funded from the resources associated with other municipalities, autonomies and other legal or personal entities (Jenčová, Litavcová, Štefko, Maťovčíková, 2013).

According to Slovak law, own sources of financing of municipalities are the share of the tax on personal income (shared tax), revenue from local taxes and fees, proceeds from disposal of municipal property and budgetary organizations or municipal companies, penalties for violation of financial discipline imposed by the municipality and other non-tax incomes- administrative fees (Košošta, Flaška, Bolcárová, 2014).

Although it is not the task of local government to directly create economic development, it is strongly responsible for creating the right conditions for investment, for business activities. The municipality has the obligation to ensure conditions to meet the needs of the population, but also the right to regulate the development of the territory. Its services have a direct and immediate impact on the quality of life of the people in this community, influencing the attraction of businesses in this area and employment opportunities for the population.

The municipality is an important integration factor for the development of the territory (Žárska, Ferčíková, 2015). It has knowledge of local needs and provides many services with a direct impact on local development, such as infrastructure, education, spatial planning, child and senior care, etc.

Municipalities need to be actively involved in economic development. It can enter the economic development of the region in various ways, e.g. utilization of municipal assets, financial resources at its disposal and management of activities of all economic entities (Belajová, Balážová, 2004).

Several domestic authors, e.g. Kološta, Flaška, Bolcarová (2014); Hájek, Olej (2008); Országhová, Papcunová, Hornyák Gregáňová (2018) dealt with the determinants of the position of local government in regional development and concluded that one of them is the financial potential of the municipality.

The financial potential of municipality greatly limits the expenditure of local governments. Local governments want to minimize spent or endangered money through incentives to develop new economic development activities. At the same time, the local authority wants to maximize the benefits for its inhabitants. It uses local taxes.

Local taxes have the potential to affect the local and regional economy. On the one hand, they are able to attract new citizens as well as entrepreneurs to the territory; on the other hand, they may affect the structure and spatial distribution of existing entities in the area (Papcúnová, Hudáková, 2019).

On the other hand, there are also opinions that "in Central and Eastern Europe the importance of typical local taxes as a factor of regional development is relatively limited" (Swianiewicz, Kurniewicz, Kalcheva, 2019).

Successful financial management of a local authority ultimately depends on the ability to plan ahead, and to adjust its revenue and expenditure plans to reflect changes over time in its basic economic, spatial, demographic and physical environment. Any significant change in the economy of the country also affects the financial management of municipalities (Papcúnová, Hudáková, 2019). Therefore, it is important to make these changes very carefully and forward to consider possible consequences.

McDonald (2017) summarized responsible financial management into four areas. It is the ability of the community: to accomplish immediate or short-term financial obligations, to meet financial obligations over a budgeted fiscal year, to accomplish long-term financial obligations and to finance the base level programs and services as required by law. The efficiency of financial management expresses the financial condition of the municipality. It is very important an attribute, it shows the ability of municipality to support development activities in the administered territory from its own financial resources. The good financial condition of the municipalities is reflected in the successful and sustainable socio-economic development of the regions.

Different terms are used in the available literature to indicate the good financial condition of municipalities. Some authors speak about financial creditworthiness; financial credibility; financial situation; others talk about financial stability, fiscal health, financial power or financial performance. However, most authors relate them to regional development.

The financial condition of the municipality according to Žárska and Rafaj (2016) consists of financial creditworthiness, property creditworthiness and development creditworthiness. The financial creditworthiness of the village is an evaluation tool for the citizen as it allows us to see the position of his municipality as a result of the quality of the work of his elected representatives (Žárska, Ferčíková, 2014). The financial credibility of a local budget determines the competitiveness of a region and secures the effective implementation of its economic objectives. It shows the feasibility of financial security of regional development and its conformity with the

national policy objectives, regional resources and interests (Liuta, Pihul, Kubakh, 2015). The analysis of Šebová and Petríková (2015) has confirmed that low financial credibility represents a serious problem for municipality connected with lower quality of public services. This has a negative impact overall region. The financial stability and responsible financial management of the municipalities are important starting points for their long-term sustainable regional development (Šebestová, Majerová, Szarowska, 2018).

A number of approaches have been developed within the domestic and foreign literature to understanding fiscal health, e.g. Hájek, Olej (2008); McDonald (2017); Országhová, Papcunová, Hornyák Gregáňová (2018) and other documents (Develop tax policies that strengthen communities and the region).

The financial power of municipalities means the total amount of funds from taxes and subsidies from the state budget, converted to the amount per capita (Šebová, Petríková, 2015).

Országhová, Papcunová, Hornyák Gregáňová (2018) presented the application of selected financial indicators to the assessment of the financial performance of the municipalities in the Slovak Republic in the period 2005-2015. Based on the inclusion of the municipality in the corresponding category concluded that financial performance indicators give to municipalities the opportunity to compare each other.

Building on their knowledge, we add that he basis of the financial analysis of municipality is the creation of suitable indicators. In all European countries, municipal budgeting and financing practices are determined by fiscal rules and regulations set by national governments. Municipal fiscal indicators are an annual compendium of information. The data provides key financial and demographic information on municipalities in every country. Financial indicators are a strategic management tool that provide the stakeholders with a concise and systematic way to organize voluminous data contained in financial statements (e.g. balance sheets, income statements, and statement of cash flows) into meaningful summary (Suarez, 2009).

As we found out, there is no uniform set of indicators to assess the financial condition of municipalities. If it were, international comparisons would also be possible. Ryan, Robinson, Grigg (2000) reported, that research debate on relevant financial performance indicators for local governments is scant and somewhat limited. These indicators need to be diverse, because local government activities cover the spectrum of operations. The indicators of financial situation can greatly assist in the decision making of the council and the mayor of the municipality. They inform on the conditions of the municipal budget. The decisive indicators for calculation should be based on tax revenues.

Šebestová, Majerová, Szarowska (2018) proposed to use the indicators of evaluation of budget management, municipal indebtedness and municipal liquidity in assessing the financial condition of municipalities.

Országhová, Papcunová, Hornyák Gregáňová (2018) suggested three variables for evaluating the financial creditworthiness of a municipality: P1= current incomes of municipalities (tax incomes, non-tax incomes, grants and transfers) to current expenditures, P2= non-tax revenues of municipalities to total revenues, P3= capital expenditures of municipalities to total expenditures.

Papcúnová and Hudáková (2019) analysed the following relationships: LT1= incomes from local taxes of municipality to tax incomes, LT2= incomes from the real estate tax to tax incomes, and LT3= incomes from local taxes to current incomes.

Gál (2012) characterizes the concept of financial analysis on the basis indicators that include the tax strength of the municipality, financial strength, debt capacity and the degree of self-sufficiency.

L. Horváthová (2010) considers the degree of financial self-sufficiency of municipalities to be the most important indicator of their financial situation.

In the Slovak Republic, the system of assessment of a financial efficiency in the local self-government is complicated. This is due to the fact, that the local self-government is not primarily supposed to provide the profit, but to guarantee services for inhabitants, which will increase the quality of their lives (Országhová, Papcunová, Hornyák Gregáňová, 2018).

The key topic, whether local taxes in Slovak municipalities generate resources for development, was illustrated by several researches by Slovak authors.

Šebová, Petríková (2015) documented that Slovak municipalities have different approaches to financing development. The largest cities use the most credit resources, medium-sized cities have a prudent investment policy and small towns have the largest share of own resources funding. Žárska and Rafaj (2016) assessed the financial situation of the Slovak Republic's cities and municipalities to ensure their development on the basis of indicators of normal and capital accounts, debt financing, immediate liquidity and net assets for the period 2009-2014, according to the different size categories. Papcunová and Hudáková (2019) evaluated changes in the local tax incomes and their impact on the development activities of municipalities in the conditions of the Slovak Republic in the period 1993-2017. Romanova, Radvan, Schweigl (2019) analysed critically the constitutional backgrounds of the local taxes' legal regulation, assessment, and collection in the Slovak Republic and the Czech Republic. Cíbik first analyzed the financial situation of municipal budgets on the example of municipalities in the Ilava district. He used an internationally recognized indicator to express the financial independence of the budgets of Slovak municipalities. In cooperation with Meluš (Cíbik, Meluš, 2019) he evaluated the development of the financial system of revenues and expenses of territorial self-government created by the application of fiscal decentralization in the conditions of the Slovak Republic during the period 2009-2018.

Recently, after decentralization of competencies in 2001 and fiscal decentralization in 2004 in Slovakia, the significance and importance of local taxes has grown. Municipalities have become more independent from state government and subjective decisions of state representatives. They receive local taxes. However, they prove to be insufficient.

Total local taxes oscillated in 2015 between 20-25% of all municipality incomes (Klimovský, 2014). Today the number is significantly lower. The analysis of Papcúnová and Hudáková (2019) showed that despite the systematic legislative changes, the income from local taxes constitutes the minimum amount of funds within the tax incomes as well as within the current incomes of municipalities. Based on many years of experience, we assume a share of 11-12%. We will further verify it by statistical examination.

It also depends on the size category of the municipality. The small municipalities have insufficient economic capacity and do not produce any real tax incomes. This fact significantly limits their fiscal independence and leads to a shortage of qualified staff for the provision of public services (Sedláková, 2008). In municipalities with a population of less than 1,000 inhabitants, own income from local taxes and fees covers only wages of employees, which represent a large part of expenditures in small municipalities. There are no resources to development activities (Šebová, Petríková, 2015).

3. Research and Results

This research evaluates municipalities in Slovakia in terms of indicators expressing the financial capacity of municipalities focused on its ability to participate in development activities. When assessing the financial situation of municipalities, authors were focusing on selected indicators of financial and property creditworthiness defined by Žárska and Rafaj (2016). The analysis was adjusted to the limitations of the available data.

The research is based on quantitative data provided by Slovak DataCentrum (financial statements on the implementation of the budget of the public administration entity and the balance sheets from years 2014 - 2018) as well as information that is publicly published by the administration of municipalities disclosed on the INEKO website. Analysis and results were processed in MS Excel application.

The local self-government of 2,890 Slovak cities and villages is provided by 2,929 municipalities, since two largest cities, Bratislava and Košice, are divided into 17 and 22 city districts with their own municipal authorities. The 2,916 municipalities were included into our research (we excluded some of Slovak municipalities due to the incomplete data). Based on the number and the structure of data from DataCentrum we grouped municipalities by the total number of inhabitants in a municipality and by the Slovak regions.

Slovakia consists of eight regions: Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov and Košice (see note beneath all tables). Based on the size of population, we divided municipalities into the following ten size groups: from 0 to 99; 100 to 499; 500 to 999; 1,000 to 2,999; 3,000 to 4,999; 5,000 to 9,999; 10,000 to 19,999; 20,000 to 49,999; 50,000 to 99,999 and the last one over 100,000 inhabitants. Further in this paper, we mention only the upper limit of the intervals, i.e. –99; –499; –999; –2,999 etc. We created 71 groups of the municipalities, hereinafter referred to as region-size groups. It means that each region-size group will be a proxy municipality that represents a certain number of Slovak municipalities belonging to the particular Slovak region and considered size category. The following table 1 shows the number of the municipalities included in the region-size groups in last observed year (in the considered years there were insignificant differences in the number of municipalities caused by an increase or decrease in population).

Table 1. Frequency of municipalities by regions and size categories in year 2018

Region/Size	-99	-499	-999	-2,999	-4,999	-9,999	-19,999	-49,999	-99,999	-100,000	Total
BA	1	5	11	34	10	6	3	1		18	89
TT		44	71	105	14	6	5	4	1		250
TN	5	76	82	82	15	4	5	5	1		275
NT	1	92	102	127	12	8	3	5	1		351
ZA	11	81	71	109	20	13	3	3	2		313
BB	31	244	130	83	7	9	6	4	1		515
PO	79	280	153	115	16	7	6	4	2		662
KE	7	167	139	97	15	9	2	3		22	461
Total	135	989	759	752	109	62	33	29	8	40	2916

Regions: BA – Bratislava, TT – Trnava, TN – Trenčín, NR – Nitra, ZA – Žilina, BB – Banská Bystrica, PO – Prešov, KE – Košice

Source: the authors based on data from DataCentrum

In terms of the size categories of municipalities, up to 90.4% of Slovak municipalities belong to the small size groups (with a population of up to 2,229). In region point of view, the highest number of municipalities is located in the Prešov region, followed by the Banská Bystrica and Košice regions (22.7%, 17.7% and 15.8%, respectively as mentioned) and the lowest number is in the Bratislava, Trnava and Trenčín regions (3.0%, 8.6% and 9.4%, respectively).

The following section states points out a few interesting facts illustrating the financial situation and starting points of our individual proxy municipalities. In the succeeding two tables, we present two indicators per capita, again only for the last evaluated year. For each Slovak region and Total row and column, we highlighted the three smallest values by using grey shading of the cells, as well as the three largest ones by using bold font format. An important instrument for supporting the local development of the municipality is, among other things, their own non-current assets, which can be managed for the benefit of the municipality and be a potential source of its own income. For better comparability, Table 2 shows the values of non-current assets per capita in thousands €.

Table 2. Non-current assets per capita in year 2018 (in thousands €)

Region/Size	-99	-499	-999	-2,999	-4,999	-9,999	-19,999	-49,999	-99,999	100,000	Total
BA	1.7	2.6	1.9	1.7	**4.0**	2.6	**2.8**	2.1		**3.9**	**3.4**
TT		2.1	2.3	**2.6**	2.1	**3.2**	**2.6**	2.4	2.5		**2.5**
TN	**4.4**	2.0	1.9	2.2	**3.2**	2.5	2.4	1.8	2.4		2.2
NT	0.9	2.2	**2.4**	**2.5**	2.2	2.1	1.8	1.6	**2.6**		2.2
ZA	1.8	1.8	**1.9**	1.8	1.7	**2.2**	1.6	1.9	**4.1**		2.3
BB	1.7	1.8	2.2	2.4	**2.6**	**3.0**	2.4	2.1	**3.0**		2.4
PO	2.3	2.3	2.1	2.0	**3.2**	2.6	**2.5**	1.7	2.5		2.3
KE	1.1	1.9	2.0	**2.2**	1.9	**2.6**	2.0	2.0		3.3	**2.5**
Total	2.1	2.0	2.1	2.2	2.5	**2.6**	2.3	1.9	**3.0**	3.7	2.5

Regions: BA – Bratislava, TT – Trnava, TN – Trenčín, NR – Nitra, ZA – Žilina, BB – Banská Bystrica, PO – Prešov, KE – Košice

Source: the authors based on data from DataCentrum and INEKO

The lowest values of non-current assets per capita exhibit two smallest size categories –99 and –499 (with the exception of proxy municipality –99 in the Trenčín region with the value €4,400 per capita) and surprisingly size category –49,999 (with the lowest overall value about €1,900 per capita). The table shows that larger municipalities have larger assets per capita. The highest overall values in term of size categories are reached by over 100,000, –99,999 and –9,999 proxy municipalities (about €3,700, €3,000 and €2,600, respectively), regarding Slovak regions, it is obvious, the richest municipalities are located in the western part of Slovakia, in the Bratislava and Trnava regions (€3,400 and €2,500 per capita) followed by Košice region (also €2,500 per capita, where the overall result is improved by the city of Košice). In terms of the value of non-current assets per capita, the Prešov, Žilina, Trnava and Nitra regions appear to be poorer regions (€2,300 and €2,200 per capita).

The indicator of tax strength is considered to be the basic indicator of the financial analysis of the municipality and expresses the total amount of taxes that go per capita to the municipality. It represents the tax autonomy of the municipality (the volume of tax revenues that the municipality manages and can use for financing its original competencies), measures the tax yield of the municipality and reflects the proportion of local and shared taxes per capita.

Table 3 illustrates the values of tax strength per capita for individual region-size groups, as well as overall results for respective size categories and Slovak regions in € for year 2018.

Table 3. Tax strength per capita in year 2018 (in €)

Region/Size	-99	-499	-999	-2,999	-4,999	-9,999	-19,999	-49,999	-99,999	100,000	Total
BA	**806.7**	453.0	426.3	374.7	**892.3**	583.0	668.0	509.8		802.7	**612.9**
TT		357.1	417.8	439.3	406.0	470.6	**512.5**	**530.0**	543.6		**459.6**
TN	324.5	332.6	356.5	407.6	459.5	**486.2**	**493.9**	464.8	528.8		428.3
NT	**571.2**	343.6	406.6	393.4	352.3	434.1	**459.8**	450.0	558.6		441.1
ZA	409.5	375.2	374.5	423.0	396.0	487.2	**495.9**	**511.7**	552.0		**447.2**
BB	384.9	328.3	383.5	407.5	383.3	**451.7**	**443.5**	443.2	**531.7**		417.5
PO	333.2	337.6	371.0	371.0	**474.5**	**471.2**	468.1	447.0	**510.0**		420.4
KE	427.1	320.5	357.5	356.5	395.5	417.4	**450.1**	**437.5**		565.6	414.2
Total	465.3	356.0	386.7	396.6	469.9	475.2	**499.0**	474.2	**537.4**	684.2	455.1

Regions: BA – Bratislava, TT – Trnava, TN – Trenčín, NR – Nitra, ZA – Žilina, BB – Banská Bystrica, PO – Prešov, KE – Košice

Source: the authors based on data from DataCentrum and INEKO

Tax strength per capita is lower in small size categories of municipalities (with the exception of proxy municipalities of size category -99 in Bratislava and Nitra regions) compared to municipalities from size group -9,999 and higher. The lowest values are reached in the size categories -499 to -2,999 (on average 379.8 € per capita), the highest values are in the two largest size groups -99,999 and 100,000 (on average 610.8 € per capita) followed by municipalities from size category -19,999. These municipalities, with two exceptions (proxy municipalities in Bratislava and Prešov regions) reach one of the three highest values of this indicator in the respective region. The municipalities with the lowest value of this indicator are located more in the central and eastern part of Slovakia (Banská Bystrica, Prešov and Košice regions). The following two figures (Figure 1 and Figure 2) show the development of this indicator also in the examined years 2014 to 2018, but only in terms of overall results for the considered size categories and Slovak regions.
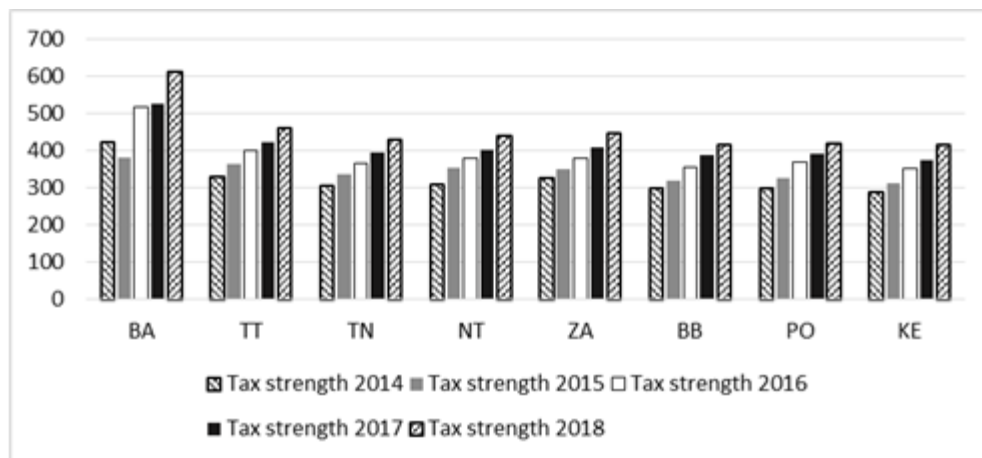
Figure 1. Tax strength per capita by regions in 2014–2018 (in €)
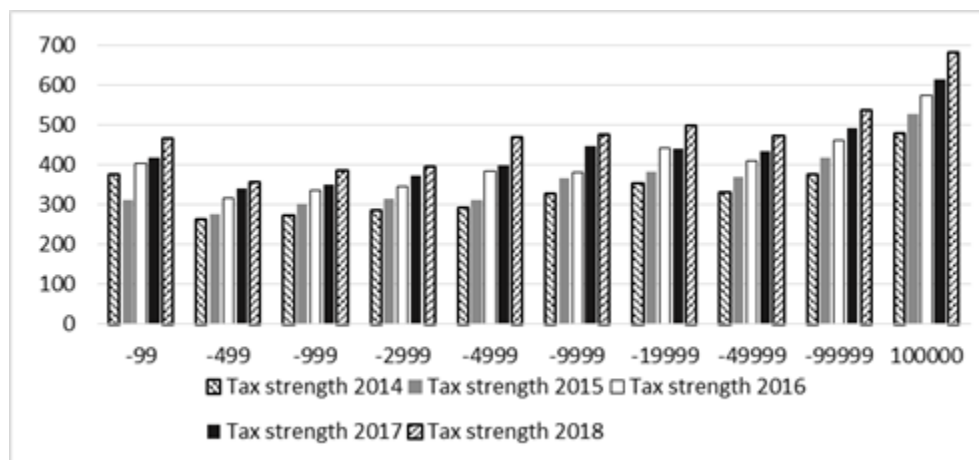
Figure 2. Tax strength per capita by size categories in 2014–2018 (in €)

Source for Figures 1–2: the authors based on data from DataCentrum and Ineko

In terms of development over the considered period, we can observe a positive progress, a slight but not a significant increase in values of this indicator, respectively, preservation of the values of the previous year. The exceptions are the values of overall tax strength in Bratislava region and in the lowest size category of municipalities –99, where the value decreased in 2015 compared to 2014, afterwards surged the following year. From the perspective of regions, we observe the lowest value of tax strength in the Košice region (on average €348.4 in the observed period), the highest one in the Bratislava region (on average €492.1 in the observed period). This indicator is very similar in case of the Košice, Prešov and Banská Bystrica regions, values fluctuate around €355.4 per capita in observed period. The trend indicates an increase towards the western Slovakia. In terms of the size categories, the values of this indicator increase from the smallest to the largest size groups except for the first size categories –99 where the values of tax strength exceeds the values of following three size categories (from –499 to –2,999). The highest values of the tax strength per capita are reported by proxy municipalities of the size category 100,000 (on average €575.6 in the observed period), the lowest ones are in size category –499 (on average €310.2 in the observed period). The trend, the larger size category, the greater the value of the indicator is disrupted only in case of proxy municipalities from size category –19,999 with an average value of € 423.4 in the period under review.

The self-sufficiency rate (SSRate) is an indicator of the financial creditworthiness of a municipality, which illustrates its financial stability, self-sufficiency in generating its own income. It is calculated as the ratio of current own income to total income and it expresses how much of the total income of the municipality is obtained from its own resources (optimally it should be over 50%).

Next two figures (Figure 3 and Figure 4) show the development of this indicator in the terms of overall results determined by regions and size categories (overall results are adjusted for the real number of municipalities in respective proxy municipality) in observed years 2014-2018.
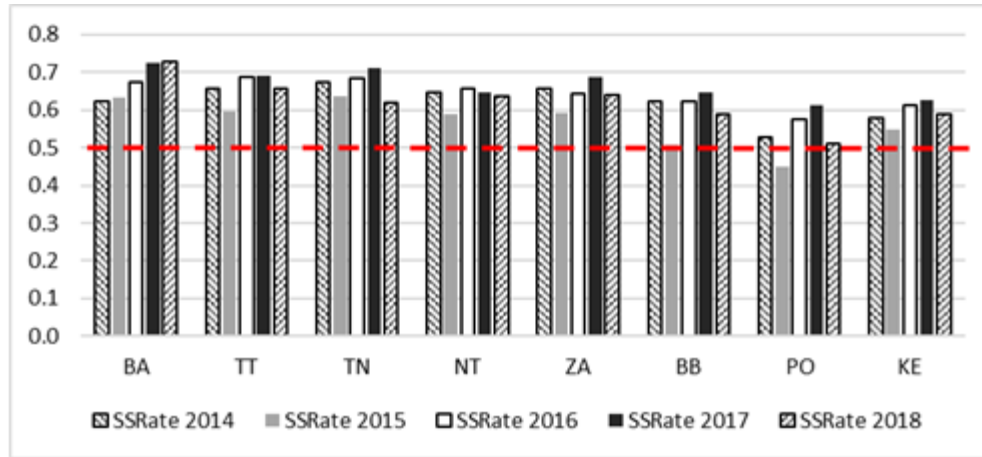
Figure 3. Total self-sufficiency rates by regions in 2014–2018
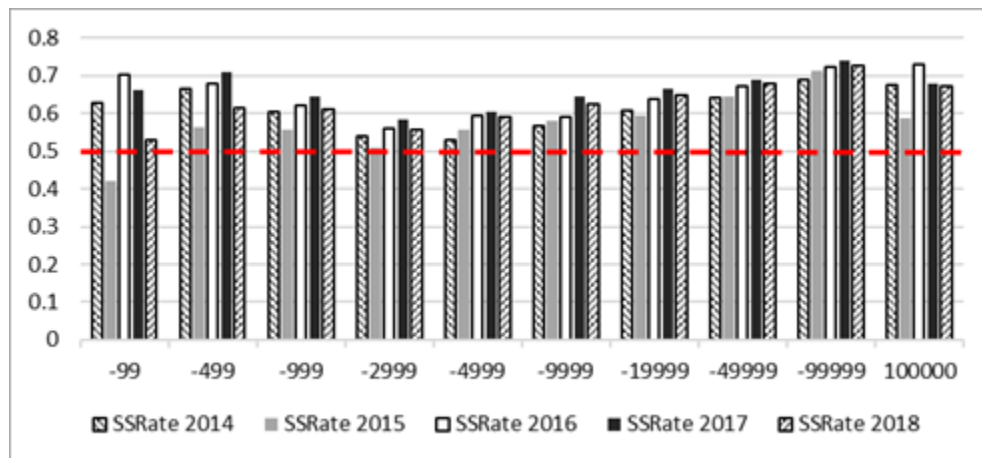
Figure 4. Total self-sufficiency rates by size categories in 2014–2018
Notes: SSRate – Total self-sufficiency rate

Source for Figures 3–4: the authors based on data from DataCentrum and Ineko

The behaviour/development of SSRate in terms of the regions shows slightly better results for municipalities in the west of Slovakia compared to the rest of Slovakia. The municipalities show financial self-sufficiency in creating their own incomes in the range of 45–73% in the observed period. In terms of size categories, the values of this indicator are also quite balanced, larger size categories achieve slightly better values. This trend is disturbed by size categories -2,999 and -4,999, although all values are above 50% with one exception (SSRates in 2015 for size category –99). The values fluctuate around 42–74% in the observed period. The total SSRate for Slovakia is on average 61% per municipality in this period.

Finally, the following figures show two important ratio indicators of the potential own financial sources of municipalities, the self-financing rate (SFRate) and the rate of tax autonomy (RateofTA). We present them again only in the term of overall results by regions and size categories (overall results are also adjusted for the real number of municipalities in relevant proxy municipality) in the evaluated period 2014-2018.

SFRate is calculating as a ratio of current own revenues to the current expenditures and among other things quantifies the space for possible development activities (e.g. for capital expenditure) of the municipality from own financial sources. If the rate is less than 1, municipality needs external financial help/resources for development projects and contrary, the value greater than 1 expresses the ability of municipality to invest using their own resources. RateofTA expresses the ratio of local taxes on total incomes and expresses the ability of the municipality to ensure income from own sources – local taxes.

The Figure 5 and 6 show total SFRates by regions and size categories, respectively. In terms of development of these ratio indicators over the considered period, the magnitude of the increase or decrease in the values of these ratio indicators is minor. This trend varies from case to case, but these positive or negative changes are not so significant for at least the last three observed years.
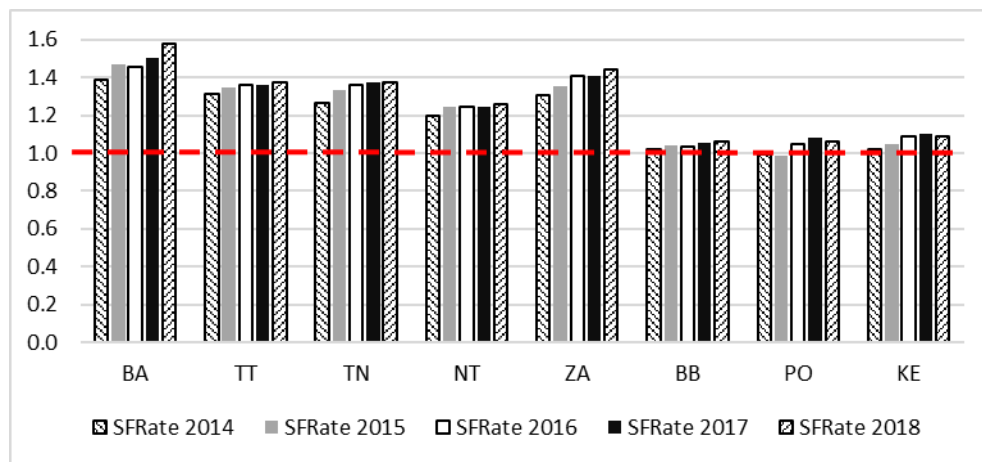
Figure 5. Total self-financing rates by regions in 2014–2018
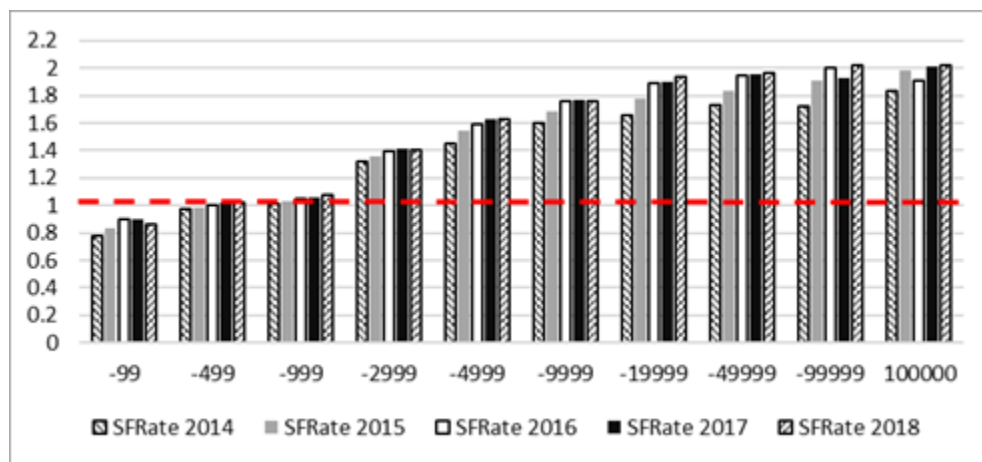
Figure 6. Total self-financing rates by size categories in 2014–2018
Notes: SFRate – Total self-financing rate

Source for Figures 5-6: the authors based on data from DataCentrum

Almost all values of this indicator, with the exception of SFRate of size categories –99 and –499, are above the value 1 (somewhat slightly, but rather significantly). From the perspective of the regions we also observed a

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decreasing trend of these values from the western to the eastern part of Slovakia, disrupted by the Žilina region, where the values of this indicator are the second best after the Bratislava region. The lowest values of SFRates were achieved in Banská Bystrica and Prešov regions, followed by Košice region. In case of municipalities in the Banská Bystrica and Prešov regions, we suggest that it is caused by the fact that these two regions have the largest number of municipalities in small size categories (from -99 to -999). The values of the SFRate indicator range from 0.98 to 1.58 in the observed period. From the size categories point of view the trend is unambiguous, smaller size category smaller values of SFRate, with increasing population the value of this indicator also increases. In the case of the first two size categories, the SFRate indicates that current own revenues were not sufficient to cover current expenditure and no longer to finance potential development activities. The values of SFRate range from 0.78 to 2.02. The total SFRate for Slovakia is on average 1.17 per municipality in the observed period.

Naturally, the lower values are achieved in case of indicator RateofTA (see Figure 7 and Figure 8).
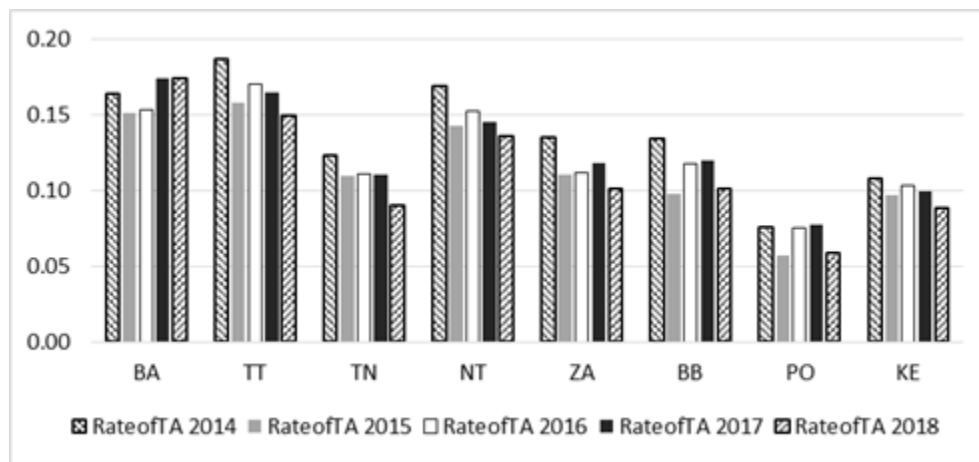
Figure 7. Total rates of tax autonomy by regions in 2014–2018
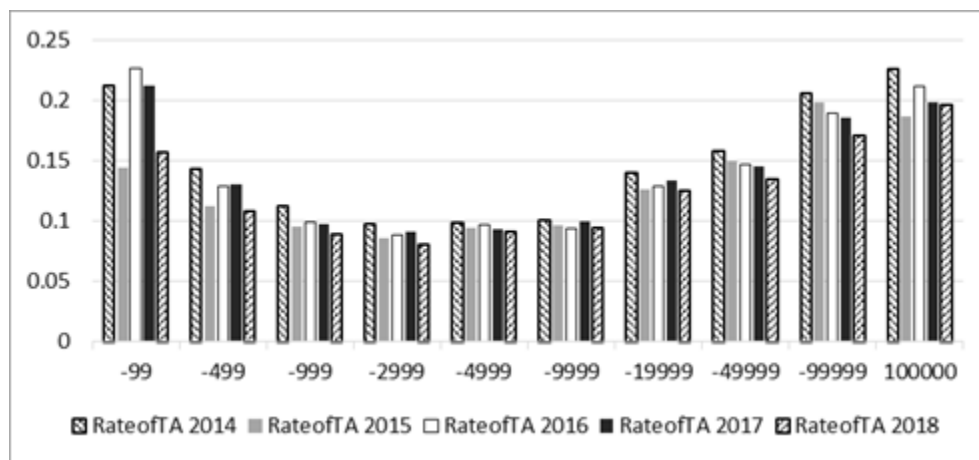
Figure 8. Total rates of tax autonomy by size categories in 2014–2018
Notes*:* RateofTA – Total rate of tax autonomy

Source for figures 7-8: the authors based on data from DataCentrum.

In case of regions, the lowest value was achieved in Prešov region, where the proportion of local taxes to total revenues in 2015 was only 6%, on average only 7% in the considered period. The highest values are in the

Bratislava and Trnava regions, with the proportion of local taxes on average 16% in considered period. Surprisingly, in terms of size categories the lowest values were not achieved by the smallest size category, but by the size category –2,999 with the proportion of local taxes on average only 9% in the observed period, followed by the groups –4,999, –9,999 and –999 with values range from 9% to 11% in this period. The highest values were reached by the lowest size category –99 with proportion of local taxes 14–23% and by the highest one, with proportion of 19–23% in observed years 2014–2018. Overall result for Slovakia is 11% per municipality in this period. In several cases, we can register a rather slightly declining trend of this indicator within the monitored years, which was caused by a change in the proportion of shared taxes (from 67% to 70%) allocated to municipalities under the State Budget Act. In the years 2016 - 2018, the total volume of collected share taxes intended for municipalities even increased.

4. Discussion

The methodology for solving this problem is challenging due to the varying opinions imposed by researchers. There is not a uniform set of indicators to assess the financial situation of municipalities, as the expert discussion on relevant indicators is not yet complete.

As regards the analysis, a high degree of territorial fragmentation can be observed in Slovakia, since 90% of all municipalities belong to the small size categories up to 3,000 inhabitants, which naturally leads to a negative impact on their ability to participate in regional development since they have worse financial and property conditions. The municipality's property is a potential source of its own income, but according to the results of the analysis, it seems that its size is significantly influenced by the size category of the municipality. The results of non-current assets per capita in 2018 showed a worse starting situation for small municipalities with less than 1,000 inhabitants compared to larger ones. A better starting point was in case of municipalities from 5,000 to 10,000 inhabitants, almost all of them reached one of the three largest values of this indicator. The largest municipalities with a population over 100,000 had the best property assumptions for development (with an average value of up to €3,700 per capita).

In terms of the tax strength of municipalities per capita in Slovakia in year 2018, the lowest values were achieved by smaller size groups (mainly up to 3,000 inhabitants). Regarding to development in period 2014-2018, the total value of this indicator for Slovakia increased on average from €322.2 to €455.1. From the perspective of the regions, the value of the indicator is growing towards the west of Slovakia.

Regarding the level of self-sufficiency in generating their own income, Slovak municipalities, both in terms of regions and size categories, can cover them on average around 63% and 61%, as mentioned. It means that they do not have to use external resources in the form of bank loans and state subsidies to cover their current expenses.
The results of the self-financing rate in monitored period showed that from the regional point of view, all municipalities have their own financial reserve, which could be used for regional development, although the amount varies considerably. The municipalities of western Slovakia exhibited significantly better results (on average 1.35) compared to the rest of Slovakia (on average 1.13). In terms of size categories, only municipalities with over 1,000 inhabitants generate a reserve for possible development activities (on average 1.75).

We can conclude that the share of local taxes in the context of total revenues (tax autonomy) in the conditions of the Slovakia is insignificant (overall average value in observed period 11%). Once more, a higher value of the indicator was reported by municipalities in the west of Slovakia (except the Trenčín region) compared to the other regions. In the case of the Prešov region, it was on average only 7% for the whole period under review, which indicates considerable regional differences. Unexpected result occurred in terms of size categories, where the smallest municipalities of up to 99 inhabitants achieved the second highest values (overall average value in

observed period 19%). The size category of municipalities from 1,000 to 3,000 inhabitants reached the lowest values (on average 9% in observed period).

Conclusions

Local social and economic conditions of individual municipalities, their raw material facilities, infrastructure and human resources are naturally different. This significantly determines the circumstances of business and investment, and thus the possibilities of regional development.

The municipality should be an activator of regional development and directly influence local conditions by attracting potential investors in the managed territories. If a municipality is better equipped with business activities, it also generates a higher level of development for the whole region. These business activities generate higher local taxes and better financial condition of municipality.

Not only foreign, but also Slovak authors pay great attention to the evaluation of the good financial condition of municipalities. However, there is no clear definition what this means. We worked with studies in which the authors used various groups of indicators, which they considered an important basis of their evaluation. We think that in the financial analysis of municipalities it is possible to use already existing indicators, but they can be modified by own goals and intentions.

Using selected indicators, we analyzed the financial situation of municipalities in Slovakia to found out whether they are able to create space to support development activities from the perspective of eight Slovak regions and ten size groups of municipalities by population. We wanted to show how the individual size groups of municipalities contribute to the healthy financial condition of the region. We used quantitative financial and demographic data on Slovak municipalities from 2014 to 2018 obtained from the DataCentrum and Ineko websites and processed them in MS Excel application. We presented two financial indicators per capita: non-current assets and tax strengths, as well as three ratio indicators: self-financing, self-sufficiency and tax autonomy rates. The most important results are presented in the discussion, but the key conclusion is that the financial capacity of Slovak municipalities is limited. They do not have own financial resources for other as original competencies, which causes their low active participation in regional development. We realized that while regional development is not only determined by the level of financial resources, financial resources are the main prerequisite for development. As we found out, local taxes in Slovakia are only a marginal, additional financial source for municipalities.

Further research in this area is also necessary and important. Unless clear and universal indicators available to monitor the financial situation of municipalities can be found, it will not be possible to compare them with each other and adequately evaluate the possibilities of their participation in regional development. The comparison between countries is also influenced and complicated by the different local tax systems. However, many attempts to harmonize them are contrary to the basic principles of the European Charter of Local Self-Government, according to which the municipality has the right to own property and own local tax system. It is true that the tax burden on labor in Slovakia is unbearably high compared to other countries, but at the same time it is true that revenues from local taxes are lower in Slovakia than abroad.

The results of municipalities in small size categories suggest that in order to successfully complete the process of fiscal decentralization, it would be necessary to merge small municipalities to create economically larger and more capable units. The better results of municipalities located in western Slovakia are probably also due to the fact, that the self-governing regions of western Slovakia are the regions with the largest share of foreign investment. Therefore, sustaining of friendly economic situation of municipalities is important not only through an active approach on the part of municipalities, but also on the part of the state.

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Acknowledgements

About contributors:

Assoc. Prof. Katarína LIPTÁKOVÁ, PhD. is a member of the Department of Political science at the Faculty of Political Science and International Relations of Matej Bel University in Banska Bystrica, where she conducts lectures, seminars and consultations both in daily and in external forms. At present, he is professionally involved in pedagogical and scientific research activities within the Economic theory, World Economy and Human resource management.
ORCID ID: https://orcid.org/0000-0002-6711-1405

Dipl. Eng. Zuzana RIGOVÁ, PhD. is an assistantprofessor of the Department of Quantitative Methods and Information Systems at the Faculty of Economics of Matej Bel University in Banska Bystrica. She has long years of experience with Information and Communication Technologies. Her research is focused on the issues of measuring efficiency in education and local government by using Data Envelopment Analysis methods and in data analysis by using available applications and tools.
ORCID ID: https://orcid.org/0000-0002-7525-1619

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STRATEGIC ALIGNMENT AND IMPLEMENTATION OF CODES OF CONDUCTS IN ORGANISATIONS

Juliane Meixner [1], Jozef Papula [2]

[1,2]*Comenius University Bratislava, Faculty of Management, Odbojárov 10, 831 04 Nové Mesto, Slovakia*

E-mails: [1]meixner3@uniba.sk; [2]jozef.papula@fm.uniba.sk

Abstract. Using the example of the automotive industry, this paper explores with a view to the many scandals in this particular branch (such as the Dieselgate scandal) how the values declared in the codes of conduct in this industry can be practiced in a more sustainable manner in daily business. This is because the branch has been not short on declared values, or the many strategic and operative guidelines to follow. A solution to this challenge thus likely only can be expected from a systemic approach. Based on the assumption that the level of appeal of a code is a vital but by no means sufficient prerequisite for internalisation of values, firstly indicators have been developed to assess the appeal of a code of conduct, such as the topicality of scope, comprehensiveness, relevance, comprehensibility of language and content, formal design and didactic transformation. Using these criteria, 18 codes of conduct have been analysed of companies from the automotive industry and the devised pool of criteria condensed to the key attributes that define the measure of appeal of a code. In the follow-up step, experts have been approached to give their opinions on how the values declared in the codes of conduct can be implemented in a more sustainable manner in strategic and operative alignment of corporate and management culture. This is because alongside a topical and didactically structured code of conduct, the likelihood of internalising values is higher where also the corporate organisational structure and process flows as well are adjusted for compatibility with such norms. With the aim to make the codes more effective, a total of 10 main scales and 62 criteria have been determined. Three of the scales deal with the didactic and content design of the codes, five with the organisational structure, corporate processes and controlling and two with qualifications and personal growth. The values of the variables on the scales are comprised into a summary value that represents the development level of a corporate value culture. The summary value and profiles can be used as benchmarking references and a basis for self-evaluation as well as a dynamic value management. The scales aid successful internalisation and implementation of the value culture as part of corporate culture.

Keywords: corporate social responsibility; code of conduct; ISO 26000 standard; value management; corporate culture; value controlling

JEL Classifications: M14, M59, L20

1. Introduction

Values define a company's reputation and provide stability, reliability in how business relations are managed and give orientation in national and international competition (Wahyudi et al., 2020; Ji & Ihsan 2019). As such, they reflect the efficiency of corporate operations and are a key indispensable prerequisite for market success of products and business models in a global market environment. In particular companies with a global scope of operations align their values with international standards, such as can be found in particular in the corporate social responsibility (CSR) approach (ISO 26000:2011; Grigore et al., 2020; Baumgartner, 2020). But the formal commitment to these values failed to avert major irregularities in many branches of the economy, with very public repercussions. In particular the financial crisis and the many scandals it brought around fraud and manipulation continue to raise doubts about actual real-life worth of once declared values. The result is a loss of trust not just in the banking sector (Schlick, 2019). In the meantime, many new scandals such as the Dieselgate scandal (Meck, 2017), affairs in the pharmaceutical industry (dpa & aerzteblatt.de, 2018) due to counterfeit medicines or in the construction industry (Buschmann et al., 2018) have additionally dented trust in how effectively mandatory government supervision is actually being performed.

Against this backdrop, it is elaborated on the example of the automotive industry how despite a corporate culture that embraces ethical and social values, irregularities in conduct could occur. As part of the effort, a systemic approach is constructed that includes the variables of (a) the effects of the international value shift, (b) prerequisites in organisational structure and process flows for an implementation of values and (c) determinants that promote individual and collective internalisation of pursued values.

To promote the internalization of the intended values, the Codes of Conduct is of central importance. The degree of attractiveness and the communication of these guidelines have an effect on identification with this management instrument and thus also on the internalization of the intended values. The quality criteria that determine the degree of attractiveness of these guidelines were identified. In order to optimally influence the degree of effectiveness of the change in values, an additional process variable was used in this research approach. With this additional process variable, the three system components shown could be compatibly aligned in a coordinated dynamic process to a higher level of competence. From these considerations the thesis of this investigation approach could be confirmed: The likelihood that the values of social responsibility proclaimed and intended in the Codes of Conduct will be implemented sustainably and effectively and internalized by employees increases if identification with the Codes of Conduct is successful and the strategic and operational orientation of the corporate culture is aligned with one another, and both organizational development and individual and collective qualification are geared to the intended change in values in graduated and coordinated processes.

2. Theoretical Background

Synonymous with global and international alignment of values is the corporate social responsibility (CSR) approach. The approach also reflects the fast pace of change in values. The long continuity of CSR that goes back as early as the 1950s has fostered an extensive debate on sustainability and has made social responsibility a core concern in corporate policies (Bowen, 1953). While the ethical focus of CSR initially was conceived as a tentative guiding principle with self-commitment as an option, these ideas gradually evolved into social responsibility as a mandatory requirement (Ioannou & Serafeim, 2019; Schultz, 2011). Mainly in recent years, CSR has been a growing staple in public awareness. Today, it is being increasingly discussed and recognised both nationally and internationally as a guiding principle of ethical behaviour (Camilleri 2016; Osemeke et al. 2016). By virtue of this, CSR as a concept also has been expanded ever further and has been treated increasingly as mandatory in the public debate. Many companies align their corporate culture, their codes of conduct and their sustainability reports with this particular approach (Official Journal of the European Union Directive 2014/95/EU; Federal Council 2016, printed matter: 547/16; Federal Council 2017, printed matter: 201/17). These concerns and

intentions are addressed by the ISO 26000 standard and ways are shown how the philosophy of CSR can be implemented in enterprises (DIN ISO 26000:2011).

Today an economic decision that runs counter to the expectations of corporate social and ethical responsibility may be detrimental to a company's reputation and its market success (Herbel & Herbel, 2020; Peloso & Travis, 2020). The negative impacts of such decisions may be actually completely detached from the corporate core business, as evidenced for example by the current case of "signalling technology for a coal-fired power plant" by the Siemens Group in Australia. "*Given the devastating large-scale fires in Australia, this is a DEATHBLOW to Siemens' reputation. A corporation that is regularly securing orders in the order of billions in any currency now is being faced with public shaming because of an 18-million euro transaction*" (Fromm, 2020). With the updates to liability law, recently also the liability risks for ethically questionable behaviour, as shown by Papula et al. (2014), have skyrocketed up to prison risks for managers and supervisory board members. The strategic alignment of corporate culture apparently also with a view to such risks has become a management task. A clear and unmistakable commitment to corporate values by the management today is deemed a core and essential prerequisite, not least because in the event of disputes and recourses, members of corporate boards are measured by this commitment. A strong statement of conformity by the management with the declared corporate culture underscores both the importance of the values and their binding nature (Lehner 2019). But even an explicit commitment to the values in itself apparently is not sufficient. Due to the many scandals around fraud and manipulation, doubts arise about actual real-life worth of the declared values. On the other hand, each case of irregularity lends itself to calls for regulatory measures and involvement of the lawmakers. But additional new acts of law and regulations, such as the German Transparency Directive Implementation Act (CSR-RUG of 17 April 2017) ultimately only are going to have an effect on succeeding in conveying the values these laws and regulations seek to implement to a wide audience of staff in companies. There are good signs that this may succeed. The respective prerequisite is a strategically aligned corporate culture that relies instead on fine words only on organisational implementation and individual internalisation of values (Ioannou & Serafeim, 2020). In that, on the one hand the prerequisites need to be established for the ethical dimension of CSR to take hold in order to nurture corporate social responsibility while also promoting alignment with the strategy in the company. The classical approaches of risk management and risk controlling failed to prevent antitrust law violations and corruption, fraud and accounting-related offences (Cadbury Committee Report, 1992; Durst & Henschel, 2020; Bistrova & Lace, 2016). Consequently, it is not enough to rely on compliance statements and formal control systems but the conflicts of interest between economic and ethical values need to be discussed and addressed systemically (Eijsbouts, 2020; Gutterman, 2020). The current scandals thus raise the question about the meaning, viability and scope of values, and how the values can be implemented more effectively as a core integral part in corporate process flows for successful and sustainable corporate operations. The strategic alignment of the corporate culture in the process cannot be just managed unidirectionally in a top-down approach but there also has to be communication in the bottom-up direction. Prerequisite for this is a more consequent focus on dialogue with corporate internal and external stakeholders at all tiers of the organisation (Harrison & Wicks, 2019). This is where the mid-management has a particularly important role. Remišová und Lašáková point out in their study this rethinking of corporate philosophy (Remišová & Lašáková, 2016). This lays particular responsibility on managers as role models and promotors of values. Remišová and Lašáková use in this context the notion of a moral leader (Remišová & Lašáková, 2013; Lašáková et al. 2013). The "ethical lead at the top" is, by the studies of Trevino, Brown and Hartman, of key importance (Treviño et al 2003). Weaver, Trevino and Agle determine in another study how and under what conditions managers may influence others to identify with the corporate culture (Weaver et al. 2005). For this, they deem as the top integrating element the code of conduct. Key in order for this ethical code to be effective is that the code's intentions and presentation style are convincing enough for managers and that they identify with the content. Above all however, they expect the higher management echelons they report to fully subscribe to these values as well, which needs to be proven by evidence. The individual values evolve in the company in a dynamic development process at three levels: the organisational level, the team level and the individual level. At each level, different processes take place, which however need to be mutually aligned

in the process flows. The topics at each of the levels are different and level-specific (Erpenbeck, 2018). The core question at the organisational level is *"How can the organisation define and continuously develop its common values?"* (Erpenbeck & Sauter, 2018) The question at the team level reads: *"How can team-relevant values be built with a view to the team's strategic needs?"* (Erpenbeck & Sauter, 2018). On the individual level, the question that arises is: *"How can personalised evaluation processes for all staff members be enabled with a view to the strategic needs of one's own work area?"* (Erpenbeck & Sauter, 2018).

The effect of values as a decision making aid is moderated by inter-individual and system-specific influences, as even values that are accepted and internalised do not necessarily guarantee a value-based collective behaviour (Kučera, 2020). The irregularities of the Dieselgate scandal occurred despite the company and its employees having subscribed, at least formally to corporate social responsibility (Werner, 2019). It can also be assumed that large parts of the workforce had internalised the values. For instance, many staff members were well aware of the ethically highly questionable nature of the diesel powertrain manipulations, but they were unable to assert their concerns in the company's hierarchy, whether out of fear of social ostracism, or because ethical conduct, if conflicting with economic aims, was latently or blatantly penalised in the system (Thompson, 2019). With a view to the newly established whistleblower systems, the aim for the future is to contain this risk (VW Group, Sustainability Report, 2017; VW Group, Shift Magazin, 2018). This additional organisational unit is part of a more comprehensive value management that must meet the challenge of integrating system-stabilising values from strategic all the way down to operative areas of the company. A prerequisite for this to succeed is for the organisational framework to be aligned with the values. Today it is a hard fact of business life that implementation of values is not just a moral and ethical question, but the value culture of a company also has an existential and economic aspect to it. These connections are underscored by the repercussions of the Dieselgate scandal. Considerations on how to reinforce the "ethical capital" today are in shareholder assemblies up to management boards and supervisory boards an increasingly prevalent topic. And, investors as well increasingly refer in their decisions to this "ethical capital" of companies (Groth, 2018; Stüttgen, 2017). This shift in importance and value shift has resulted in this concern having been addressed in some companies, such as the VW Group, also organisationally by management in that dedicated organisational units have been established at the management board level. While other corporate areas such as marketing and finance have been managed with the aid of robust management systems, there has been indeed a lack of controlling concepts for the implementation of corporate culture in this particular area of management board activities to mutually align the complex processes and structures with the pursued forms of conduct. In many companies, addressing non-conforming forms of conduct in legal terms still has been the primary focus, including also how by regulations, non-conforming and harmful conduct can be avoided, recognised early on (whistleblower systems) and penalised in the future (VW Group, Whistleblower System, 2021). Better chances of success as compared to pushing penalties are seen in approaches that aim at internalisation of values. In order to promote this process in a targeted manner, the question arises how the implementation and the level of presence of the values pursued in codes of conduct can be measured at the individual and organisational level.

Should it succeed to effectively use indicators of the level of presence of values in general and also applied to the specific requirements of each job and consequently to individual skills and competences, the threat of scandals could be substantially reduced. The first modest forms of value controlling can be found in sustainability reports. Such reports mostly refer to the principles of the Global Reporting Initiative (GRI) and its coefficients and indicators (Geschäftsstelle Deutsches Global Compact Netzwerk 2014). For value controlling though and the topics it includes, only indirect and non-specific conclusions can be expected on corporate "ethical capital" (Global Reporting Initiative 2000; Global Reporting Initiative 2016). This is where the strategic and operative challenges lie of a sustainability-focused value management. To coordinate, initiate and develop value controlling, at the organisational level the appointment is needed of a value management team. The team further also is in charge of analysing and maintaining the current corporate culture and advancing the value shift that can be expected as a result of the change processes. Key at all corporate levels though is that the values are

communicated in a continuous top-down and bottom-up process. The model suggests involvement with the values on a continuous and active basis, thus extending far beyond formal cataloguing, description, identification and certification of values. This active involvement facilitates internalisation and continuous further development of values. This resolves the concerns of value management in its actual sense.

There is no lack of references in the literature to the internalization of values and an organization and management culture that is compatible with them. Particularly with a view to change management and coaching, a variety of approaches to influencing behaviour based on values are currently being discussed and scientifically supported (Stolzenberg & Heberle, 2020; Webers, 2020; Lauer, 1999). These approaches have a long tradition and reach far back into the previous century. The social science approach to "organizational learning" has received special attention in this development. In this context, the question arose as to which structural prerequisites must be created for a suitable learning platform and how the acquired patterns of action can be stabilized. The studies focused primarily on the teaching of cognitive abilities, skills and knowledge. Studies on this can be found, for example, in the action theory of Argyris, who sought access via models of instrumental learning, focusing primarily on learners under specified structural conditions (Argyris, 1993; Argyris & Schön, 1996). This study follows the CSR approach to corporate value. This shifts the importance of the learning plateau from cognitive to affective learning goals (Worbach et al, 2019). The CSR concept places high value-based demands on both companies and employees. A fundamental reorientation of this research approach aims at a consistent orientation of the implementation and internalization of values in a cyclical maturation process, which can be represented in development stages. The idea of a cyclical maturity process can also be found in other business management approaches, such as the life cycle of a company (Thommen et al., 2020) or in marketing concepts (Mishra, 2020; Stark, 2019). Inspired by these approaches, these thoughts were also transferred to the development of values in a company. Examples of this approach can be found in the historical-oriented development model according to Frederick (2008, 2006, 1994), the development model according to Visser (2011), the pyramid approach by Caroll (1979) and the maturity model according to Schneider (2015). These approaches emphasize the structural organizational approach but neglect the specifics of an individual and collective dimension to be delineated. Therefore, the aim of this study is to elaborate the interactions between organizational implementation and individual internalization of values in their mutual interdependencies as an independent dimension. In order to depict this process, the contents of this process, which determine the degree of organization on the one hand and the degree of maturity on the other, must be elaborated. The items for determining the degree of organization could be derived from ISO 26000:2011. A central, but not sufficient basis for determining the maturity level is the Code of Conduct. Unlike ISO 26000, which can be used to determine the degree of organization, there are no binding quality criteria and quality standards in the Codes of Conduct. These must be worked out and developed in the study. A Code of Conduct aims at a value-determined behaviour that indirectly describes, prescribes and demands ideal-typical behavioural patterns via a compilation of typical interpersonal action areas prioritized by the code. The behaviour underlying the behavioural patterns is value-determined and is influenced by situational circumstances. However, the effectiveness of these guiding principles depends on quality standards, which must first be developed in contrast to ISO standard 26000.

The investigation into the elaboration and development of quality standards is based on the consideration that the Codes of Conduct must be logical in themselves, appealing to the addressees, reflect the current state of the discussion on values, and be consistent and compatible with the structures, processes and incentive systems of the companies. The following research hypotheses are derived from this to determine the degree of maturity:
1. The attractiveness of the design and the relevance of the topics to the addressees are important prerequisites for ensuring that the "Code of Conduct" attracts interest and attention and that employees identify with these values.
2. In addition to the design, the topicality, completeness and weighting of the values and fields of action of the Code of Conduct are also decisive for its attractiveness.

3. The corporate culture cannot be ordered unilaterally, but must be continuously communicated in an internal and external stakeholder dialog in a top down as well as bottom up process.

The 18 examined Codes of Conduct show serious deviations in structure, depth of content, design and other qualitative items. It is striking and noteworthy that companies that were particularly involved in scandals fundamentally revised their Codes of Conduct and developed special quality standards in the process. These comparably high quality standards for the Codes of Conduct were found primarily at companies that had a reputation with a recognized corporate culture. Based on an analysis of these documents and the expert interviews, authoritative items were developed that make up the quality standard of a Code of Conduct. This confirmed the first hypothesis of the study: "The attractiveness of the design and the relevance of the topics to the addressees are important prerequisites for ensuring that the Code of Conduct attracts interest and attention and that employees identify with these values." Successful companies, according to a further finding from the document analysis and the expert interviews, focused on updating the Codes of Conduct and involved the stakeholders in this process of changing values, promoting dialog with the internal and external stakeholders of the groups through varied communication platforms. Thus, the two further research approaches could be confirmed.

Further indications for describing and safeguarding the quality standard were found in the literature on the didactics of textbooks, on the comprehensible language of texts and laws, on indications for the structure and design of forms, and even on recommendations for the design of advertising texts.

3. Methodology

For purposes of this study, the method has been chosen of qualitative social research. The qualitative method suits the investigation aims as it exposes social reality in a world as perceived and experienced by the study participants (Flick, 2017; Lamnek, 2016; Merriam, 2009). In the course of the examination, document analysis was combined with the interview method (Mayerhofer 2009). Subject of the document analysis were 18 codes of conduct (primary documents) of the largest global automakers. As secondary references, an additional 410 documents were included in the analysis – statements, published interviews and business reports. The next step involved interviews with 32 experts about their particular experience in order to verify and clarify the findings and explore them in more detail. In choosing the documents and in interviewing the experts, biases and subjective setups and assessments were to be avoided by an explorative approach as well as a clear delimitation and definition of the scope of the examination.

As primary references for the document analysis, codes of conduct of 18 among the largest global automotive manufacturers (eight European, four U.S. and six Asian corporations) were included in the analysis. Further insights in the examination were supplied by legal analyses and pertinent reporting.

All the corporations included in the document analysis have a global scope of operations. Differentiation by continents of countries of origin nowadays does not make much sense anymore or provide additional information anyway due to the internationalised supply chains. For example German firms such as the BMW Group as well as the VW Group have their production sites in many countries and regions of the world, and the same goes for U.S. corporations such as Ford Motor Company and General Motors.

This internationalisation of large corporations necessitates despite the many differences in thinking and legal differences a value set that is equally valid in all continents and regions even despite their different legal systems. A code of conduct that imposes global rules of conduct for all parts of a corporation must, despite the wealth of many different cultural imprints, stances and latent and explicit legal standards, find a common denominator.

As further important documents, sustainability reports of the companies were examined for the status of values declared in their codes of conduct. While a code of conduct specifies the desired forms of conduct, it was verified using the sustainability reports whether their findings match the declared intentions.

For the interviews, mostly experts were chosen from corporate units with cross-departmental scope of operations. In such functions, dealing successfully with the assigned tasks is contingent upon one's place in corporate hierarchy, powers assigned and the resources available. This pool of experience has been successfully explored and included in the examination. Through impulse questions, the experts were encouraged to report preferably freely about their work situation and pertinent challenges, and approaches to deal with these.

4. Results

In this study, quality norms have been identified and it has been shown which attributes define the appeal of a code of conduct. A code of conduct in this paper is defined as a collection of typical types of activities in human to human interactions that are prioritised in the code of conduct and for which the ideal forms of conduct are described, defined and enforced.

The codes of conduct of the companies explored meet these criteria and deal with selected practical guidelines, types of activities and core topics, as described also in ISO 26000. Which types of activities are prioritised in terms of scope and content depends on the issues faced by the particular company. The likelihood that these rules of conduct will be observed and the underlying values internalised will be higher, by the assumption of this study, where the codes of conduct in terms of content and scope are structured logically, in an appealing manner for the recipients and deal with values in a way that is up-to-date with latest insights in the general discussion on values. Further also they must be compatible with the structures, process flows and incentive systems of the company. To meet these needs, a number of questions need to be clarified, such as what defines the level of appeal of a code of conduct. Neither the German Transparency Directive Implementation Act of 11 April 2017 nor ISO 26000 provide specific guidelines, ideas or recommendations on this. Secondary literature on the CSR approach as well in general and the codes of conduct in particular do not provide any qualitative recommendations as to how and by what criteria a code of conduct needs to be structured and which quality norms promote identification of staff with the code. For that first, a pool of criteria was compiled from different sources.

The items derived and developed from the study are not only a sound aid for the development of the Codes of Conduct. They can also be used for an analysis of strengths and weaknesses in the context of benchmarking. However, these items are also an indispensable basis for coordinating the development steps of the organizational structural level with the personal level and for steering a sustainable stage-oriented development process. This succeeds because the degree of organization as well as the collective maturity level can be determined by quantifying the items. This process variable, which is introduced into the study, makes it possible to synchronize the development of the organizational and maturity levels and, with an energy expenditure that can be optimally controlled, to move effectively to a higher level. In this way, organizational resources are used optimally and human overload, defence mechanisms and frustrations are avoided. Based on these references, six evaluation aspects have been identified that have been assigned differentiating evaluation criteria. Specifically, these are the following six evaluation aspects with pertinent evaluation criteria:

- Formal design of the code of conduct, with the evaluation criteria of scope, date of first and follow-up publications, topicality, the topics addressed in the preface, structure of the preamble, layout of the table of contents, scope of topics, prioritisation of topics, verbal and non-verbal;
- Design, with the evaluation criteria of formal layout, font size and font type, spreading the flow of text with visual elements, how text is combined with visuals, and the page layout;

- Comprehensibility and the language style used, with the evaluation criteria of simplicity, relevance and appeal to the recipient, formal structure and logical flow, brevity and conciseness, encouraging effect and dramaturgy;
- Visual and text layout, with the evaluation criteria of visuals that are relevant to the recipient, integration of visuals with text and colour style;
- Appeal to target groups that encourages identification with the message, with the evaluation criteria of realism and authenticity, motivating, challenging and instructional address, adequate style used and grammatical complexity.
- Didactic transformation, with the evaluation criteria of didactic transparency, arrangements that promote conveying the topics, variation of methods, media variety

The 18 codes of conduct were compared with each other using these evaluation criteria on a 10-point scale and verified for relevance to determine their level of appeal. The results with the total of six evaluation aspects and 36 evaluation criteria overall were comprised into two particularly relevant evaluation categories with a total of 15 criteria.

The central parameters of this management process, which is geared toward continuity and sustainability, are the degree of organization and the collective or individual maturity of the employees. Both areas of management must be steered toward an increasing level of social responsibility in a stakeholder dialog. The study was able to confirm the research hypothesis and it was possible to work out that the degree of attractiveness of the Code of Conduct favours the probability of internalization and implementation of the proclaimed and intended values of social responsibility in a sustainable and effective manner. The degree of effectiveness can be increased if, in addition, individual and collective qualification is geared toward the intended change in values in graduated and coordinated processes. These interrelationships have not yet been addressed either in basic scientific research or in corporate practice. Recommendations, standardizations and minimum standards for a didactically prepared Code of Conduct were found neither in the scientific literature nor in application-oriented research. The study was therefore unable to draw on any studies geared to this purpose and had to work out the basics for determining the degree of attractiveness of a Code of Conduct on its own. In doing so, findings from business education, learning psychology and communication sciences were used. The importance of scientific validation of the Codes of Conduct is becoming a recognized competitive factor for companies, probably also as a significant part of the strategic orientation of risk management. Since individual misconduct can become a risk that threatens the existence of the company, companies are focusing on preventive measures to implement and internalize the intended corporate values.

In this study, basic principles were worked out for this purpose in order to determine the degree of organization, which maps the structural organizational prerequisites (e.g., organizational structure, process organization and business processes), and to determine the degree of maturity. To this end, binding quality standards for the Codes of Conduct first had to be developed - comparable to ISO standard 26000. In a further step, the items developed were combined to form assessment clusters. These evaluation clusters allow thematic focal points to be identified and profiles to be drawn up for benchmarking and the company's internal fields of action. By quantifying the level of organization and maturity, it is possible to effectively steer and optimize the development process toward a higher level of social responsibility. This makes it possible to map the interdependencies between structural organizational conditions and the development of individual and collective developments in a model, thus placing the maturity (Schneider) or pyramid (Caroll) model on an empirical basis. Both dimensions can be represented in this developed model in their mutual dependence. In order to further harmonize the results and recommendations for action, these findings should be backed up with quantitative social research methods. The methodological prerequisites necessary for this are given by the content-related determination and quantification of the items and can be considered clarified for the in-depth quantitative investigation. On this data plateau, three major delimitable research approaches can be identified. First, the items and clusters underlying the degree of

organization and maturity must be checked for completeness, reliability and validity using suitable statistical methods such as correlation, regression and factor analysis. In a further research approach, the correlations and dependencies between the degree of attractiveness of the Code of Conduct on the one hand and the identification with the intended values on the other should be worked out using correlation and regression analyses. Such an analysis can be expected to provide a more reliable prediction of the effects of the degree of attractiveness on identification with the intended values. What has been elaborated in this qualitative study through experts and documentation analysis can be more precisely determined and verified through this quantitative analysis. Then the resources for systemic control of the development steps can be optimized and the benefits of these measures can be predicted more precisely. This is especially true for the verification of the elaborated step-related development model. In the context of this question it is to be worked out, which effects on the working climate, on the achievement orientation and on the psychological load are to be counted on, if the development steps exceed the tolerance range to be defined between organization and/or degree of maturity. Two different variants can be assumed here: In the first variant, a higher degree of organization is to be assumed, and in the second variant, a higher degree of maturity. Another variable to be included in this study design is the influence of management and management tools such as risk analysis and operational integration management. For the risk and value management of a company, these investigations are important and central concerns.

Evaluation category 1: Formal Design of the Code of Conduct
What does the organisation do, … (or, what can we do …)
1.1. To promote the content of the code of conduct with an appealing design that is appropriate for the recipients.
1.2. To structure the code of conduct clearly and in an appealing manner for the reader.
1.3. To improve the appeal of the code of conduct to preferably many groups of employees in the company.
1.4. To adjust linguistic presentation for simplicity, a clear inner and outer structure, brevity/conciseness and encouraging effect.
1.5. To develop an up-to-date and appealing design in how the code of conduct is presented.
1.6. To convey complex interdependencies in a comprehensible manner and to avoid overwhelming the reader.
1.7. To facilitate active exploration of the topic.

Evaluation category 2: Didactic Design of the Code of Conduct
What does the organisation do, … (or, what can we do …)
2.1. In order to design the code of conduct in an appealing manner.
2.2. To encourage employees to actively deal with the target values.
2.3. To devise up-to-date training methods.
2.4. To use available media mainly in the digital sphere.
2.5. To promote the development and consolidation of affective learning objectives (such as multimedia approaches, training-on-the-job, e-learning).
2.6. To promote and sustain the processes of internalisation of values.
2.7. To find the right words to address staff with.
2.8. To promote and communicate the target values on the basis of value management.

The appeal of a code of conduct further also depends on how the values are updated and carried further. Consequently, the question was explored whether, how and at which points a value shift in the present codes of conduct and any earlier versions of the codes may be identifiable and what consequences can be derived from this. Conclusive information in this first step was delivered by a comparison of the current codes with their earlier versions, such as the 2015 version of the code of conduct of the BMW Group, its 2016 version and the current 2019 version, as well as the 2010 and 2017 versions of the code of conduct of the VW Group. These versions were compared for changes from formal updates (such as changes in members of the management board with follow-up update of the preface to the code of conduct to reflect the changes) to substantive updates that reflect

the value shift. Although the management board member in VW signed under the preface was replaced, neither the preface in the codes was updated nor new focus points were set by the new management board. This detail though may well have caused irritations among corporate staff, being viewed as a lacking sign of progress in focus, all the more so as the old management board member has been associated with the Dieselgate scandal. In terms of substance, the BMW Group updated its code between 2015 and 2016 with new additions in two places, and the 2019 version contains changes in four places. In contrast the code of the VW Group saw between the 2010 and 2017 versions a comprehensive update in terms of both form and substance. The level of appeal as defined by the evaluation criteria posited in the first part above was markedly improved. There were also a number of additions, more detailed specifications and changed priorities. There was a major shift in priorities, with economic and social concerns having been declared equal in importance. This amounts to a fundamental shift in values which directly impacts many other values, whether in terms of having been reclassified in weight, or in that new values were added. With the newly added note that employees are a part of the company but also of society at large, the code of conduct signals a more decisive move towards corporate social responsibility. From this part of the examination, the following assessment criteria were derived.

Evaluation category 3: Content Design of the Code of Conduct
What does the organisation do, ... (or, what can we do ...)
    3.1. To incorporate social responsibility in the core subjects, practical guidelines and rules of conduct.
    3.2. To align the range of topics and the topic focus points to the current business challenges.
    3.3. To update the content of the code of conduct and to adjust it for societal developments.
    3.4. To integrate stakeholders into the value process.

The core topics and types of activities are subject to constant change that reflects the different needs and interests of the stakeholder groups. A key question was who and how is classified by the companies as a relevant stakeholder group and how the communication processes are organised. This is done by the VW Group in an elaborate process (Birri, 2014). The company has included its stakeholders in a matrix according to priority and topics and adjusted its dialogue with stakeholders for the matrix accordingly. From this analysis, the following evaluation category follows with its assigned criteria:

Evaluation category 4: Value-Based Exchange of Information and Experience with External Stakeholders
What does the organisation do, ... (or, what can we do ...)
    4.1. To ensure a systematic acquisition of information.
    4.2. To preferably account for all relevant stakeholders and prioritise these in terms of their significance to corporate policy.
    4.3. To analyse the needs and expectations of stakeholders.
    4.4. To systematically structure the dialogue with stakeholders via exchange and dialogue platforms.
    4.5. To organise partnerships with the most important stakeholder groups.
    4.6. To support managers in their function as promotors of values ("Moral Leadership") and role models with pertinent responsibilities.
    4.7. To identify and eliminate non-conforming behaviour early on.

On how business processes and the organisational structure are aligned with the pursued corporate culture, mainly experts were approached that by virtue of their job were in charge as management representatives of the different cross-departmental functions such as occupational health & safety, health management and others. Additionally, contributions in professional periodicals and interviews published by the media were referred to. The interviews with the experts focused on integration of the values into the organisational structure and their prioritisation in daily business decisions. The experts pointed out in the interviews where and how in the organisational structure improvement potentials could be exploited in a more sustained manner. On the example of whistleblower systems, the defining attributes were determined in dialogue with the experts of structures and process flows for continuous further development of corporate culture. From this, four evaluation categories with a total of 25 evaluation criteria were derived:

Evaluation category 5: Organisational Structure
What does the organisation do, ... (or, what can we do ...)
- 5.1. To create the function of a management committee.
- 5.2. To implement a coordination board for sustainability.
- 5.3. To involve workgroups in the implementation of values.
- 5.4. To advance projects by means of project groups for priority topics.
- 5.5. To establish in the organisation the function of a management representative for sustainability activities and to place it as a board function near the head of the institution.

Evaluation category 6: Organisational Procedures and Business Processes
What does the organisation do, ... (or, what can we do ...)
- 6.1. To endow the management representatives with information competence, competence to give instructions, decision making competence, advisory competence and budget competence.
- 6.2. To reinforce personal powers for cross-departmental functions (safety at work, diversity management etc.).
- 6.3. To provide sufficient resources in terms of time and personnel (e.g. also including bundling of tasks of the same type)
- 6.4. To provide sufficient financial resources, which also can be coordinated across departments.
- 6.5. To communicate the role model function of organisational management in suitable formats to the personnel.
- 6.6. In order to establish the value framework of social responsibility in guidelines and to integrate these in the organisation (value days, employee feedback etc.)

Evaluation category 7: Alignment of Social Responsibility
What does the organisation do, ... (or, what can we do ...)
- 7.1. To adjust the mission, vision, values, guidelines and forms of conduct accordingly for the value shift.
- 7.2. To include social responsibility in strategic planning.
- 7.3. To establish social responsibility as a key part of corporate identity.
- 7.4. To implement value management.
- 7.5. To align values and guidelines for conduct with corporate policy and organisational strategies.
- 7.6. To use comparisons with the best for continuous improvement.

Evaluation category 8: Controlling
What does the organisation do, ... (or, what can we do ...)
- 8.1. To devise indicators for economic, environmental and social criteria.
- 8.2. To be able to consider input and output as well as the outcome and long-term measurements of effects as a decision making basis in strategic alignment.
- 8.3. To control developments by means of a PLANNED/ACTUAL analysis and to mitigate irregularities in time.
- 8.4. To incorporate the issue of long-term viability into decision making processes (e.g. by means of budget surveillance across fiscal periods).
- 8.5. To pursue external certification for the sake of increasing credibility.
- 8.6. To manage the continuous improvement process in coordination with stakeholders.
- 8.7. To assess the effects of training schemes and human resources development programmes relative to the costs incurred (e.g. through observation and cost/benefit analyses).
- 8.8. To regularly analyse its current and future need of personnel, with a view to the needs and expectations of stakeholder groups.

The individual and collective internalisation of values can be reinforced and safeguarded through suitable personal growth measures. As ethical potential varies between individuals in the same way as cognitive abilities

do, staff members react to the value shift at the individual level in very different ways. Analogously to "human capital" (Birri, 2014) that refers to professional capabilities, teamwork skills, soft skills and personal commitment of the workers employed by the company, this examination included an extended focus on corporate 'ethical capital'. In this respect, recruiting and corporate qualification measures on, off and near the job need to focus more alongside professional aspects on values. This also includes indicating in a more detailed and specific manner the ethical requirements of a job already in job descriptions and job profiles. A stronger emphasis on values affects the design of all personnel recruitment and selection systems. From this part of the analysis, two evaluation categories were derived with a total of 11 evaluation criteria.

Evaluation category 9: Training Initiatives
What does the organisation do, … (or, what can we do …)

9.1. To plan training activities.
9.2. To convey the communication techniques for dealing with risks and conflicts of interest.
9.3. To implement CSR values in the organisation and actively practice the values (e.g. value days, bonus schemes, volunteer days, training courses)
9.4. To align the values and guidelines for conduct with management tools such as the remuneration system, target agreements, management feedback.
9.5. To develop personal qualification and development plans for all staff members and to ensure that the use of personnel is adequate to the requirements and their respective skills and abilities with regard to the target values.
9.6. To establish in the organisation a value-based reflection of self-perception and perception by others, and to develop it further.

Evaluation category 10: Recruitment and Human Resources Management in Accordance with the Requirements and Skills and Abilities
What does the organisation do, … (or, what can we do …)

10.1. To identify and document the potential of every single employee and of the organisation with regard to the values pursued.
10.2. To align recruitment and career advancement concepts for the development of values with current and future organisational and individual requirements.
10.3. To develop and maintain a training concept in alignment with the need for personnel and human resources management that builds on current and future organisational and individual requirements.
10.4. To support and provide training-in for new staff members in securing and developing their value-based potential (e.g. through mentoring, coaching, tutoring, work assignment, human resources development),
10.5. To promote workplace mobility (internal and external).

Conclusions: Requirements for Value Management for Continuous Internalisation and Implementation of Values

An appealing code of conduct is for the "ethical lead at the top" of a company a core prerequisite, as the management's commitment to ethical values is the higher the better the level of appeal of the code of conduct. This commitment has a positive and sustained effect on the implementation of values and their internalisation if…

1. The code of conduct has a high level of appeal in terms of being up-to-date, its design, relevance to recipients and scope in terms of the range of topics included;

2. The values declared in the codes of conduct are continuously adapted and updated at the strategic and operative levels in accordance with societal value shift and the requirements of social responsibility;

3. The management personally declares its commitment to the code and the code as a management task, and the institutional framework including the corporate hierarchy, sequences of activities, processes and management systems (such as the incentive system) are aligned to be compatible with corporate culture;

4. The target values of a company are communicated in a suitable form to internal and relevant external stakeholders, and accepted and shared by these;

5. The individual and collective internalisation of values is aided by auxiliary training and education activities, sustained by a coherent HR concept (internal and external recruitment, use of personnel) and continuously developed through success checks.

From these five premises, the evaluation scales provided above were derived and conceived. These can be used as part of self-evaluation at all levels in a company for continuous further development and implementation of values by employees, teams and project groups. But also, these scales are a reference basis for strategic value management. As companies and organisational units differ in the attained level of ethical awareness and their development stages, the aim of value management is to actively shape this development process so as to reach a higher stage in the hierarchy of values. Schneider developed in this context the maturity level model and Caroll his pyramid model (Schneider, 2012; Carroll, 1979). The models by Schneider and Caroll share in common that in both, values develop towards higher maturity levels. As an insight from the expert interviews in this study, it has been found that this development process towards refinement and stabilisation of values relates to two distinct focus areas. These are designated in this study as organisational development level (evaluation categories 5, 6, 7, 8) and maturity level (evaluation categories 1, 2, 3, 4, 9, 10). The organisational development level refers to the organisational prerequisites that must be met in order for values to effectively take hold in the company, while the maturity level represents the internalisation of values. Every criterion to determine the organisational development level is assigned in a six-step quantification procedure a rating on the scale from 1 to 100. The determined values on the scale for the different criteria are provided in a partial result for each evaluation category and comprised in the next step into the summary value of the "organisational development level" on a six-grade scale. The total value of the organisational development level thus is the weighted mean of the four evaluation categories. From this detailed analysis, it can be concluded in which particular areas lie the respective strengths and weaknesses of a company, and which areas sustainable value management should focus on. The evaluation of the maturity level is performed analogously. The reference basis in this case are the six evaluation categories with a total of 37 criteria, which are also run through in a six-step quantification procedure. The six stages to describe the maturity level were developed in reference to the classification of affective values by Bloom and Krathwohl (Krathwohl et al., 1978). Each stage designates an attained individual and/or collective maturity level. The specific value of the maturity level so far can only be concluded on indirectly. Direct measurement and/or assessment of the values using for instance the classification of values as common in analogous approaches in personnel selection and recruitment with the aid of cognitive rating for abilities, competences and soft skills presents companies and specifically personnel recruitment with a substantial and as of yet unresolved challenge (Meixner, 2015). Because of this, this examination had to remain restricted to the indirect indicators listed above.

Prerequisite to continuous development of values is that both the organisational development level and maturity level are at a roughly identical development stage. Where the difference between the organisational development level and maturity level exceeds in the development process a certain critical margin, with either of them deviating excessively from what is deemed an appropriate status for the other, irregularities, irritations and emotional blocks are to be expected. These obstruct the process of change. This dynamic model relies for its relevance on interactions that have been comprised into eight premises. The development process occurs in a recurring mutual adjustment between the organisational development level and maturity level. Both should develop within a predefined tolerance range. All along, the existing mutual interdependencies need to be exploited that exist between the two areas. For instance the resources, organisational structures and process flows on the one hand shape the conduct of staff (being creates awareness), while on the other the conduct of staff shapes the organisational structures and processes.

Final remarks
It has been shown in the study that a coherent and didactically structured code of conduct that reflects current societal values is for a successful cultural change a core prerequisite, which though by itself is not sufficient. In

order to raise awareness of employees about social responsibility, other prerequisites must be met as well. These prerequisites are referenced by the developed evaluation categories. As enablers with the meaning of a TQM system, they are a core part of a sustainable and process-based value management (Luthra et al., 2020; Kiran 2016).

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Juliane MEIXNER, PhD. Student, Comenius University Bratislava, Faculty of Management, Slovakia.
ORCID ID: orcid.org/0000-0003-4754-6134

Prof. Ing. Jozef PAPULA, PhD. Professor Comenius University Bratislava, Faculty of Management, Slovakia.
ORCID ID: orcid.org/0000-0001-5861-5567

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DO BALTIC INVESTORS CARE ABOUT ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG)?

Ilze Zumente [1], Jūlija Bistrova [2]

[1,2] Riga Technical University, 6 Kalnciema street, Riga, Latvia

E-mails: [1] ilze.zumente@edu.rtu.lv; [2] julija.bistrova@rtu.lv

Abstract. As the environmental, social and governance (ESG) adoption practices in large and developed economies are becoming more sophisticated, in the still developing economies the non-financial information disclosure practices are gradually evolving. This article aims to capture the ESG implementation practices and challenges of the financial investors and banks operating in the Baltic countries - Lithuania, Latvia and Estonia. By analyzing survey data of 37 financial market players, the results reveal that around 81% of the respondents already use ESG data when evaluating their investments, which can partly be explained by the regulatory drivers coming from the large share of private equity and venture funds managing local and international public funding. Moreover, a substantial average weight of 0.39 is found to be attributed to the sustainability factors in the investment evaluation process, which is rather high given the general perception of the ESG being a recent addition to the investment evaluation tools. While 51% of the respondents admitted that Covid-19 pandemic has made no changes in their ESG practices, there are other common challenges named by the investors e.g. lack of general and quantifiable ESG data from the side of the companies and struggles to find matching benchmarks for the large share of the small and mid-sized companies dominating the Baltic investment market. By addressing the obstacles highlighted by this research, the policy makers can explore the ways how to foster a wider adoption of ESG policies in the Baltic investment universe.

Keywords: Environmental; social and governance (ESG); Financial investors; Sustainability

1. Introduction

With the increasing importance of the non-financial factors in the investment process, more and more investors are actively looking for companies demonstrating high environmental, social and governance (ESG) standards. While historically ESG aspects assuredly played a side role in the investment evaluation, the trend has recently been changing. The effect of the changes is twofold – while more financial investors and banks are favouring investments in high ESG standard companies, the companies themselves must start paying more attention to their non-financial performance to be able to attract financing (UN PRI, 2019). This has become even more important during the uncertainty caused by the Covid-19 crisis. The ESG investments are on the rise – despite the financial downturn driven by the pandemic, the 2020 marked a new all-time high of 1 trillion USD in assets under

management in sustainable investment funds (Morningstar, 2020). As the general uncertainty in the financial markets has increased, there is a certain pressure on the investors and companies themselves to maintain resilience in their operations, which arguably is easier achievable for the higher performing ESG companies (Reynolds, 2020).

The shift is noticed globally – by both academics and businesses. Eccles & Klimenko (2019) reported that the results of their interviews with 70 executives from 43 global institutions suggested ESG being the next priority for the global investors. Similarly, EY Fifth global institutional investor survey dated July 2020, revealed that 98% of the global institutional investors are assessing company performance using ESG factors (EY, 2020).

The Baltic countries in terms of ESG is still a growing market. Even though there are certain investors, which are actively pursuing responsible investment strategies and even leaning towards impact investing concepts (Süsi & Jaakson, 2020), the overall ESG compliance and requirements relative to the Western Europe or Scandinavia is assumingly lower. A Central Europe based survey performed by Deloitte in 2020 including also the responses of the Baltic investors, revealed that 62% of the private equity (PE) and venture capital (VC) funds believed that ESG factor consideration can increase their expected returns (Deloitte, 2020b).

In order to provide an aggregate view on ESG application, challenges and practices by the financial investors investing in the Baltic countries, this study aims to analyse the ESG preferences and policies of the financial investors and banks operating in Lithuania, Latvia and Estonia. In addition, this study expands the sample to include also smaller ticket investors – venture capital and acceleration funds - as well as banks, to see if there are differing viewpoints coming from variously sized financial investors. In addition, it might be assumed that ESG adaptation in the Baltic countries is hindered by certain challenges, which are shared by most of the investors in the market, therefore the identification of the specific obstacles is set as another goal of this study. Finally, given the certain timing of the research, the study also aims to evaluate if any changes in the investor behavior have occurred due to the Covid-19 pandemic.

In order to explore the investor view, a survey consisting of 15 closed and open-ended questions was distributed to a list of financial investors, asset managers as well as the major banks actively participating in the corporate financing. The questionnaire addressed the view on the ESG relevance, the policies and standards currently implemented and the identification of struggles the investors might have. 37 responses were gained for the survey revealing a response rate of around 66%, which taking into account the total size and number of players in the financial market can be considered as a representative sample for the region. To allow for more correct interpretation of the results and additional explanatory power, in-depth interviews were held with four respondents representing various corporation types.

This paper provides several contributions to the academic literature. Firstly, it contributes to the existing volume of the academic research, which aims at describing the ESG factor application in the investment process, in this case, in respect to the specific Baltic country geography. Secondly, by identifying the main obstacles currently faced by the financial sponsors, the hindering factors can be better understood by the policy makers and allow to make suggestions to correct for them.

The remainder of the paper is organized as follows – Section 2 summarizes the relevant literature about investors view on ESG applications and the main challenges they face, Section 3 sets forth the methodology employed in this study, Section 4 describes and discusses the results and finally, Section 5 concludes.

2. Literature review

Financial investors and ESG

With the rise of the sustainable investing, growing body of financial investors declare the inclusion of non-financial risks and opportunities in the investment evaluation process (van Duuren et al., 2016). The degree of ESG factor inclusion in the investment evaluation process varies greatly in a scale from negative screening or exclusion criteria to a moderate level of non-financial risk evaluation and finally to ESG opportunity recognition and value derivation (Schramade, 2016).

The specific long-term and active relationship between the financial investors and the companies, ensures that the private equity and venture capital companies are particularly well suited to integrate and improve the ESG standards in their portfolio companies (Invest Europe, 2021). The effect of these activities can be substantial – it has been estimated that as of 2019, the VC and PE funds in the Baltic countries had 309 active portfolio companies generating over EUR 1.6 bn in revenues (Deloitte, 2020a).

Banks and asset managers, on the other hand, can stimulate the companies to improve their sustainability standards by ensuring that a certain ESG performance has to be achieved to allow for financing or investing. In this way, an indirect pressure is exerted on the companies to improve their sustainability endeavours and consequently also financial resilience (OECD, 2020). The banks and asset managers therefore not only achieve higher compliance with the regulatory standards imposed by the European Green course initiative, but also arguably lower their exposure risk to certain risks coming from the non-financial factors.

There are several drivers fostering the wider adoption of sustainability frameworks for the financial market players. A significant influence is exerted by the asset owners, who can request certain level of ESG standards and disclosures to be ensured in their portfolio (Eurosif, 2016). A study performed by S&P, which surveyed 194 credit risk professionals employed in banks and other financial institutions, reported that 86% of the respondents indicated that increased demand of the investors is pushing the ESG factor integration in the credit risk analysis. 83% of the respondents noted that they believe that the role of ESG factors in the credit risk assessment is integral (S&P Global Market Intelligence, 2020). All in all, a higher creditworthiness is a rather strong factor pushing the companies towards sustainability improvements.

Another common driver is the regulation, which in the recent years has been developing rather dynamically. Developed within the frame of the European Commission's Action Plan on financing sustainable growth adopted in early 2018, a Regulation 2019/2088 on Sustainability-Related Disclosures in the Financial Services Sector (SFDR) is set to enter into force in 2021. The core of the SFDR lies within promoting transparency in sustainability-marked financial products and services, as well as disclosure of ESG policies, processes and principle adverse impacts on sustainability areas, which may results in negative impact on the ESG matters (Official Journal of the European Union, 2019). In line with the green taxonomy trying to unify the standards of the financial products across the industry, institutional investors, banks, pension funds and asset management funds will have to devote much higher attention to the proper implementation of the law-requested sustainability standards (OECD, 2020).

Several global and regional studies allow to estimate the current level of ESG compliance by the financial investors. So, for example, EY global institutional investor survey reveals that 98% of the institutional investors surveyed are assessing company performance using ESG factors, thereof 72% perform a methodological approach in this assessment, which indicates a significant increase from 32% mark in the prior year. Furthermore, 43% of the respondents admitted that company's nonfinancial performance has frequently played a pivotal role in the investment decision-making during the 2019 (EY, 2020). It has to be noted, however, that the global studies often

lack comparability to the developing markets. A regionally closer experience to the Baltics, therefore, is captured by the Deloitte Central Europe PE survey (Deloitte, 2020b). With respect to the ESG dimensions, 62% of respondents agreed that consideration of an ESG strategy can amplify the investment returns. When applied practically, 57% of respondents revealed that their companies always perform ESG evaluation as part of due diligence, while 28% of the respondents agreed to the statement with respect to certain companies or industries most likely to be at risk. Only 6% of the respondents suggested that they see no reason in performing ESG evaluation before doing an investment. Data availability and quality are considered the main obstacles hindering wider ESG adoption. Finally, even though the vast majority of the surveyed sample admitted that they are using ESG factors in their investment evaluation, only 30% thought that ESG can be a value driving factor. With respect to the SFDR, Deloitte has recently published a report indicating that 44% of the Central European financial investors are unaware of the details of the EU Regulation to be implemented already in the first quarter of 2021 (Deloitte, 2021). This signals that the adoption of the regulation will be difficult and potentially lagged. In addition, it is likely that as the financiers will put a higher pressure on the data gathering from their portfolio companies, the companies themselves will struggle with providing sufficient data (Morrison & Foerster LLP, 2020).

Challenges in ESG application

A commonly cited problem when addressing the obstacles in ESG implementation in the investment evaluation process is the data availability and quality. According to European Central Bank, the endeavours in creating a common green taxonomy, can only be successful if the corporate information is presented in coherent and granular manner, otherwise the metrics and comparisons cannot be properly used (Schnabel, 2020). This view is supported by the investors surveyed in 2020 by the EY, indicating that the investor dissatisfaction with the ESG data has risen since 2018. The percentage of the dissatisfied investors has increased since 2018 by 14% for the Environmental data, 20% for the Social dimension and even by 28% for the Governance factor (EY, 2020). Also academics have recognised that data inconsistency creates challenges in proper data evaluation. Kotsantonis and Serafeim (2019) in their analysis reviewed a sample of 50 large publicly listed companies and manually collected their disclosures on employee health and safety data. The authors found more than 20 different ways how the sample companies chose to report this metric, implying that such inconsistencies may likely lead to significantly different ESG scores.

The data quality is also an issue mentioned when discussing the large discrepancy in the external ratings. According to Eccles et al. (2019) there were around 500 ESG rankings, more than 100 ESG awards and 120 voluntary ESG disclosure standards estimated to be in the market. The ESG data market is growing constantly – according to Opimas market study, at least 20% annual growth is expected for the ESG data business (Foubert, 2020). As the demand for ESG data grows with the volume of responsible investing, one of the challenges that has emerged is the variances in the ESG scores by various agencies. This does not come as surprise given the hardly measurable concept of sustainability in general and inclusion of various subjective scoring attributes. In et al., (2019) highlighted the problematic of the ESG data quality, suggesting there exists a trade-off between validity and reliability of ESG data. Authors suggest that as there is no agreed theoretical framework, the data should be used with caution and the overall data quality shall be improved in order not to compromise the reliability of the data for the investors. The data quality has a direct implication also on the scores issued by the scoring agencies. Chatterji et al. (2016) examined 6 ESG raters (KLD, Asset4, Calvert, FTSE4good, DJSI and Innovest) and generally found a surprisingly low correlation among the issued ratings. Furthermore, the differences remained even after adjusting for the likely differences in the definition of the score awarding principle, implying that the agencies not only present varying definitions of the same rating, but also use different measurement techniques for the same variables. Similarly, an utmost recent paper by Berg et al. (2019) compared the ESG ratings by five market dominating ESG rating agencies (KLD, Sustainanalytics, Vigeo-Eiris, Asset4 and RobecoSAM) and on average found a correlation among the ESG scores of 0.61, which is strikingly low in

comparison to the average of 0.99 correlation coefficient among the usually compared credit ratings like S&P and Moody's. The differences were mostly explained by three main factors – (1) scope divergence – referring to various sets of attributes used by each agency, (2) weight divergence – referring to attribute weighting in the calculation of scores and (3) measurement divergence – cases, when agencies use different proxies for measuring the same attributes. Lack of ESG rating convergence is also documented by Dorfleitner et al. (2015).

In addition, as very few of the single data points can be analyzed on absolute terms, a selection of a proper peer group to perform the benchmarking exercise is a crucial step in the evaluation. As the vast majority of the ESG ratings are awarded in a relative relation to a peer group, the proper definition and allocation is crucial, however often not explicitly disclosed and therefore might lead to deviations in the actual ESG assessment (Kotsantonis & Serafeim, 2019).

According to the EY global institutional investor survey (2020), another problem lies within the disconnect between the financial and non-financial reporting of the companies. 41% of the survey respondents are dissatisfied that ESG disclosures do not communicate sufficiently how the company creates the long-term value. In this sense, the materiality assessment is to be considered. As the materiality strongly changes by the industry and geographic region, it is a key facet that investors should consider in respect of their portfolio. According to Khan et al. (2016) particularly the concentration on the specific material domains for each company ensures high ESG performance company outperformance.

Finally, as pointed out by a recent OECD Report 2020, there are also challenges in the capacity and knowledge of the financial institutions themselves. As the ESG and sustainability domain in the finance field is still growing, it is challenging for the investors and lenders to ensure that the in-house capacity is sufficiently high (OECD, 2020).

ESG in times of Covid-19 pandemic

The global health crisis starting in 2020 has caused not only severe economic implication, but also created a shift in the way investors are viewing the likelihood of such unexpected and tremendously impactful risks on their investments. According to the head of Principles for Responsible Investment (PRI), there was a concern early in the crisis that investors' focus will shift from the long-term sustainability track to the more immediate threat avoidance, however the opposite has turned out to be true as the record peaks have been documented not only in the absolute numbers of the sustainable investments, but also in the number of PRI signatories committing to high ESG standard implementation (Reynolds, 2020).

Arguably, the largest shift has been experienced by the social factor – especially in the domains of occupational health and safety, employee protection, social security measures as well as the domains of supply chain resilience and longevity, which had been put on a test with the commencement of the global health crisis. A survey conducted on PRI signatories in 2020, reported that 64% of the respondents admitted a greater focus on S dimension following the crisis (Reynolds, 2020). Similar results have been found also by the EY global institutional investor survey (2020), which summarizes that the current crisis has finally put the spotlight on the human capital disclosures shifting the focus from general rhetoric to measurable data (EY, 2020).

On the other hand, many parties agree that the current disruptions can be perceived as an opportunity in re-evaluating the importance of non-financial factors in ensuring resilience of the company's operations in times of crisis. With the significant drop in air travels and mobility, the total carbon dioxide emissions in 2020 are expected to be around 4 to 7% lower than estimated before the crisis, which has never happened before in the past (Schnabel, 2020). In respect to corporates, 71% of the respondents of the J.P. Morgan Research admitted that they likely see the current crisis as a point to re-evaluate their previous approaches to the climate change awareness by e.g. shift to more intensive online meeting tool use also in the future (JP Morgan, 2020).

Even though there is limited research on this topic so far, some early studies suggest that companies having better ESG performance are also more resilient and absorb the shocks during the pandemic better (OECD, 2020), (Broadstock et al., 2021).

3. Research objective and methodology

In order to obtain a view on ESG factor application in the Baltic market, a survey was created and digitally distributed via e-mail or Linkedin to 56 financial investors, asset managers and banks with their primary operational markets in Lithuania, Latvia and Estonia. The survey was addressed directly to the investment managers or executive level decision makers to ensure that the responses reflect the opinions of the persons generally meeting the investment decisions as a part of their daily work routines.

The survey, which was open for responses from January 4, 2021 to January 24, 2021, consisted of 15 open and closed questions focusing on the Baltic investor's opinion on (1) ESG factor importance in their investment evaluation process, (2) the methods and practices applied in the evaluation process, as well as (3) current obstacles in ESG implementation. In addition, the study was seeking to capture the investment managers experiences on how the Covid-19 crisis has impacted their view on the ESG factors and the use of them in the portfolio management.

The survey was offered on no-name basis to ensure that honest and non-biased results are obtained. In addition, to be able to better explain the results as well as capture any remaining thoughts and sentiments, four in-depth interviews with different companies (a bank, two private equities and one venture capital company) were organized.

In the survey 37 responses were gained revealing a response rate of around 66%, which taking into account the total size and number of financial institutions and investors can be considered as a representative sample for the region. As most of the financial sponsors operate across all three countries, there is limited sense in drawing country-based conclusions.

The sample split according to the operation types is presented in Table 1.

Table 1. Sample split according to the respondents operation type. Created by authors

Operation type	Count	Percentage of sample
Asset management company	10	27%
Venture capital fund	9	24%
Bank	5	14%
Private equity fund	11	30%
Early-stage investment fund	2	5%
Total	37	100%

Source: Created by authors.

Due to the diverse type of operations, the sample companies showed a wide discrepancy in terms of operation size – the average investment ticket of 4.29 mEUR was indicated ranging from a minimum of 0.05mEUR to 20mEUR. While all the banks and 75% of the asset managers surveyed had loans issues or investments made into more than 40 companies, the majority (52%) of the PE and VC funds reported having more than 15 companies in their portfolio.

4. Results and discussion

The first section of the survey aimed to estimate the sentiment of the investors towards the sustainability inclusion in the financial decision making. When the respondents were asked to reveal a personal opinion on which financial market players should consider ESG information in the investment evaluation process, two clusters emerged.
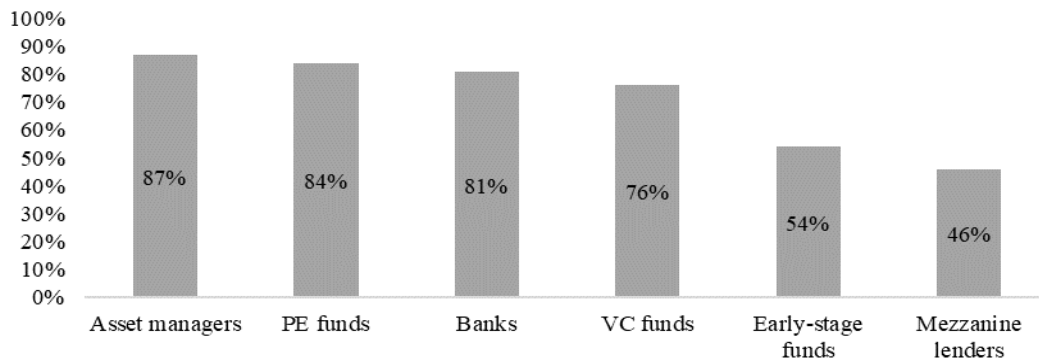
Figure 1. Share of respondents who believe that ESG factors should be considered by the mentioned type of investors

Source: Created by authors based on survey results.

As depicted in Figure 1, the vast majority named asset managers (87%), PE funds (84%), banks (81%) and venture capital funds (76%). The share of proponents was relatively smaller for the second cluster - early-stage funds (54%) and mezzanine lenders (46%). In addition, it was commented by some of the respondents that ESG factors should be considered by all those financiers, who have obtained such a mandate from their capital owners. When asked about their own experience in ESG due diligence, 81% of the respondents answered positively, whereof 46% perform ESG evaluation for all their investments and 35% do that in limited scope or for companies representing specific industries. The remaining 19% told that due to varying reasons it has not been done so far, but it is in their plans for the future. None of the respondents believed that there is no value in ESG factor implementation in the investment evaluation process.

The large share of ESG-integrating financiers and generally the positive sentiment towards the ESG inclusion goes in line with the previous conclusion that capital owners can be one of the primary drivers ensuring that certain level of ESG compliance is achieved by the investment portfolio (Eurosif, 2016). As highlighted by a recent study about investment funds in Latvia, even after more than a decade after the first risk capital funds were launched in Latvia, the funding is still largely dependent on local or international public resources (government, EU funds, EBRD etc). As found out at the time of the study, there were no VC funds in Latvia without public capital (Matisone & Lace, 2017). This finding partly explains the results – as a significant share of the sample companies manage capital, which is based on public resources, they have an implied requirement of at least a high-level sustainability risk evaluation in their investment process. In addition, the results of the survey imply that also the private capital managers are similarly minded.

As depicted in Figure 2, when asked about the drivers directly, however, most of the respondents (70%) cited global tendencies as the main reason to perform ESG evaluation. Regulatory requirements and attempt to lower the risk (each selected by 35%) came next.
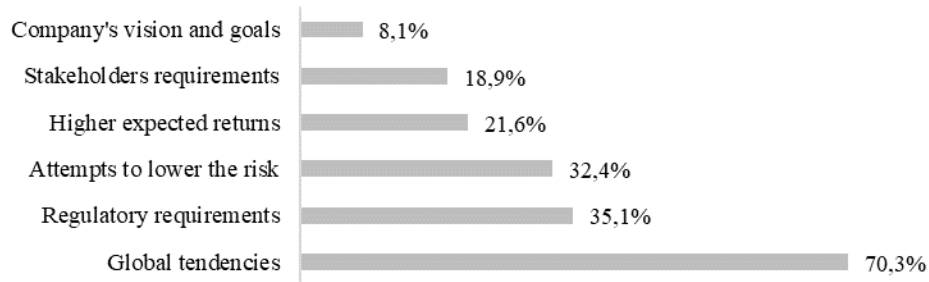
Figure 2. Share of respondents, who selected the corresponding option as a driver for their ESG inclusion

Source: Created by authors based on survey results.

In line with the previous answers, 73% of the respondents believed that ESG performance can be a value driver for the investment. Interestingly, that among the 27%, who considered that ESG factor implementation does not add any value, 80% of the respondents still admitted performing the evaluation. This implies that there are investors, who even though consider the sustainability metrics before investment, still are not sure about the value added of this process and potentially just follow the set-out guidelines or general market trends. This result comparatively is more positive than reported by Deloitte for Central and Eastern Europe investment funds, where only 62% of the respondents considered ESG factors as a value driver (Deloitte, 2020b). As further explained in one of the in-depth interviews, if previously the ESG factors were mainly viewed as a source of potential risks or mismanagement, a slow shift is happening in the market to view the sustainability factors as a source of opportunity and potentially higher return. The finding generally goes in line with the global evidence as summarized by e.g. Eccles & Klimenko (2019).

When asked about specific factor importance (see Figure 3), 49% respondents indicated that all three (E, S, and G) factors are equally important to them when evaluating an investment opportunity. Additional 35% voted for the environmental factor and 14% for the governance factor. Only one respondent mentioned the specific social domain potentially suggesting that the social dimension is yet still the least evaluated as of now.
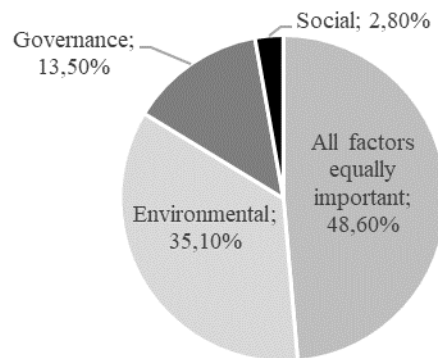
Figure 3. The choice of the most important ESG factors by the survey respondents (only one answer possible)

Source: Created by authors based on survey results.

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An important section of the study concentrated on the obstacle determination allowing to potentially explore the ways how to solve them in a meaningful manner by the policy makers. With respect to the current ESG challenges, only 16% (see Figure 4) of the respondents believed that there are no current obstacles in ESG data application in the investment process.
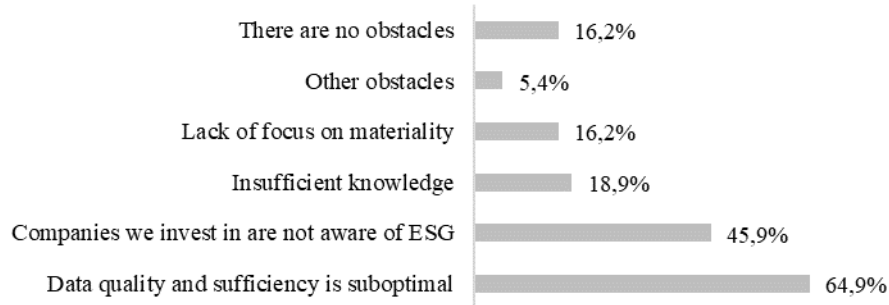
Figure 4. Share of respondents, who selected the corresponding option as an importance obstacle for ESG implementation

Source: Created by authors based on survey results.

As discussed before, globally, data availability, which goes in line with the general ESG application by the invested companies, is one of the most commonly cited obstacles in ESG application. With respect to the Baltic companies, the situation is even dimmer given the fact that only a handful of companies have an external ranking ESG score available, most of which are rather large, publicly listed or state-owned companies, which mostly are outside of the investment scope for the local financial investors (except certain largest banks and a slight share of the asset managers). The lack-of-data barrier is supported by the survey results as depicted in Figure 5, which suggest that around 86% of the respondents are not satisfied with the volume and quality of non-financial data that the companies can offer.
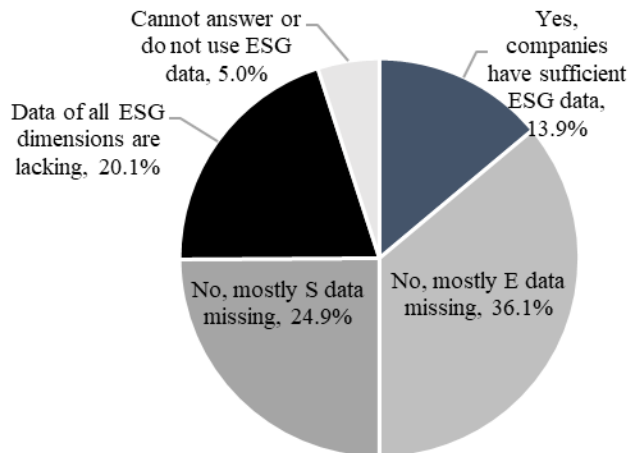
Figure 5. Do companies usually have sufficient ESG data to provide?

Source: Created by authors based on survey results.

As shown in Figure 5, the largest gap seems to occur specifically in the environmental data. Several respondents additionally indicated that the information is not sufficiently quantifiable or numeric as well as that a general ESG data infrastructure should be developed to improve this aspect. Interestingly, that from the 14%, who indicated that there is sufficient data availability, the vast majority (85%) are asset managers, which makes sense given that

these funds usually face a different kind of investment universe than locally operating banks and financial investors mainly due to the geographical exposures - while local asset managers usually have the opportunity to invest in stock markets globally, the banks and investors work with the local, most often privately-held and frequently also small and medium sized (SME) companies, thus also the ESG data universe available to them is more limited. In line with the previous research by Kotsantonis & Serafeim (2019), the lack of proper benchmark data was stated as another meaningful obstacle – as the privately held, mostly SME can hardly be comparable to the global listed peers, the financial investors are frequently struggling to understand the reasonable level of the metrics measured. Also, as noted by several respondents – due to the different reporting approaches, industries and materiality, the ESG data among the portfolio companies are rarely comparable, leading to an overall benchmarking problem in the market.

A potential solution could be the creation of a unified reporting database, which would provide access to potentially anonymous peer data to the companies choosing to disclose their own results. As pointed out by The European Fund and Asset Management Association (EFAMA) the creation of such a public EU-wide ESG database would ease the obstacles that investors face in the light of required disclosures as requested by the upcoming regulations. In addition, such data would also benefit other stakeholders as the investors, academics and general society (European Fund and Asset Management Association, 2020). While a common EU-wide database is still no present, a local Baltic country wide could be a first step if such a suggestion could be explored further by the local regulators. Correspondingly to the poor level of the general data availability, when asked about the ESG data sources used, 87% of the respondents admitted using in-house research data. While 8 respondents (22%) had used Bloomberg as sustainability data source, other data providers as RepRisk, Sustainalytics, Refinitiv and MSCI were applied on very rare occasions (on average 1 to 3 respondents had used them). Furthermore, these external databases had dominantly been used by banks and asset managers, while PE/VC majorly rely on their own in-house research and external consulting companies.

Another key topic frequently mentioned in the global investor reports is the confusion about the materiality of the specific indicators attributable to companies from different industries. Also 51% of the survey respondents indicated that materiality is an important topic that the financiers have at least on a high level discussed with their investment companies. Nevertheless, the lack of focus on material issues by the companies was cited as a serious obstacle by 16% of the respondents. Finally, in line with the (OECD, 2020) results, the lack of knowledge and experience by the financiers was admitted by 19% to be an additional obstacle implying that greater explanatory work would be beneficial to at least a part of the industry players.

With respect to the disclosure, the majority or 53% of the respondents indicated that they do not publish designated Sustainability reports, nor report such information on their webpages. Nevertheless, only 11% thought that there is no value in such disclosures for the portfolio companies, meaning that even though the disclosure practices are mostly not elaborated yet, the value of such information is recognized. As discussed before, one of the strongest driving forces for the non-financial reporting is undoubtedly the regulation. While currently the Non-financial Reporting Directive directly applies only to the large entities, the general trend in the legislation for companies moves towards greater disclosure (European Commission, n.d.). For the financiers themselves - SFDR is likely to increase the sustainability disclosures if not in the form of dedicated reports, then at least in wider information availability online.

As displayed in Figure 6, with respect to the current economic downturn, on average 51% of the respondents declined any changes in ESG agenda during the pandemic.
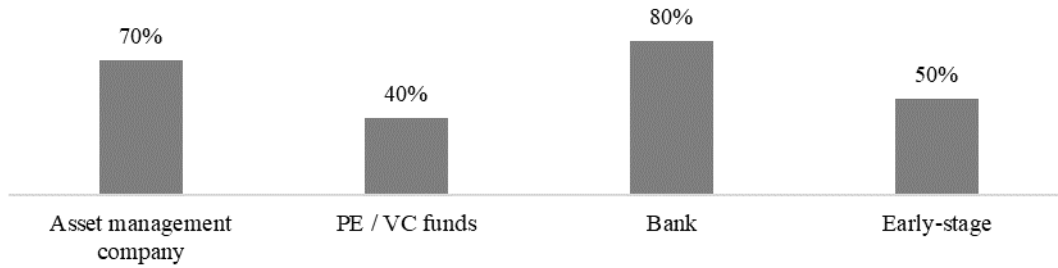
Figure 6. Share of respondents in the respective subgroup declining any changes in ESG agenda due to Covid-19

Source: Created by authors based on survey results.

Contrary to the global evidence by Morningstar (2020), only 19% reported paying more attention to the ESG risks and 16% - in specific a higher concentration on the social domain. Merely 14%, whereof all of them PE/VC funds, told that as other, more crucial factors are at risk now, the focus on the sustainability has currently dropped. It is also visible in the Figure 6, that most of the asset managers and banks, who usually have more developed Sustainability policies in place, have made no changes in the ESG perception due to the global epidemiology crisis.

Finally, while it is difficult to precisely measure the extent of ESG factor importance, the authors tried to estimate this figure by asking the respondents to appraise the approximate weight that sustainability factors cover in the overall investment evaluation process. The average result of the sample in a scale from 1 to 10 turned out to be 3.9 (median score of 3) corresponding to a weight of 0.39 in the decision-making model suggesting that even though there are various obstacles in the ESG implementation and differing views on the value added, a significant portion of the investment decisions already lies outside the scope of pure financial matters.
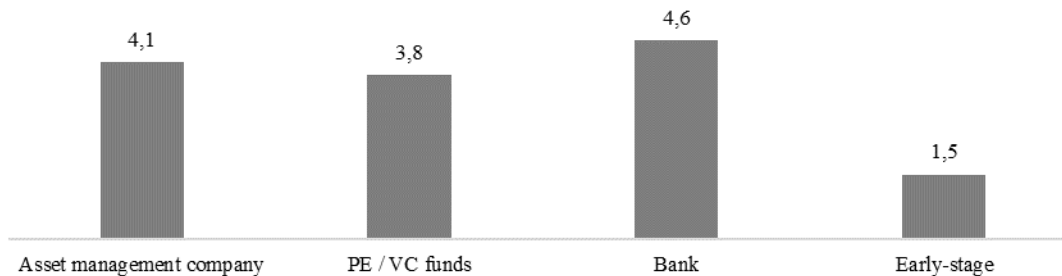
Figure 7. Average weight ESG factors play in investment evaluation measured in scale from 1 to 10

Source: Created by authors based on survey results

When dividing the scores into the operation type subgroups (Figure 7), in line with the assumption, the results show that banks and asset management companies currently put the most effort on the ESG factor inclusion, while PE / VC funds and early-stage funds are slightly below. Particularly high the result is for banks, which means that already now there are companies in the Baltic countries, which most likely cannot obtain bank financing due to the non-financial factors. Along with the finding that 46% of the respondents believed that an important obstacle for ESG inclusion is the lack of sustainability knowledge of the companies they invest in, a general undertaking from the policy makers point of view should be to raise the awareness and educate companies about the meaning of ESG factors and their implications.

5. Conclusions

The aim of this study was to understand the ESG factor application patterns and challenges of the financial investors and banks operating in Lithuania, Latvia and Estonia. It contributes to the existing research, which aims at examining ESG factor implementation practices in the investment process, in this case, in respect to the specific Baltic country geography.

Several conclusions can be drawn based on the results obtained. Firstly, the adoption of the ESG factors in the investment evaluation practice is already widely spread across the examined region - the results show that 81% of the respondents already perform ESG evaluation in at least limited extent before investing in or lending to the companies. In addition, the share of the surveyed companies, which believe that ESG can be a value driver for their investments is even larger than previously found for the entire CEE region. While the existing academic and professional literature name the requirements of the capital owners and regulation as the main factors positively driving the ESG implementation, the Baltic investors, on the other hand, mostly cite global tendencies over the regulatory requirements and risk reduction. From this result it can be concluded that the regional investors are largely up to the date with the latest global tendencies and try to implement them in their practices.

A significant contribution to the scientific literature is the identification of the specific obstacles in ESG application. In addition, based on the results of the study, corrective measures can be discussed by the policy makers. The study revealed that the current degree of data availability (including benchmarking data) and lack of respective sustainability related knowledge of the companies and the investors themselves are the key factors that harm further ESG practice implementation. The lack of data challenge is also not improved by non-financial disclosures as more than a half of the respondents admit that they do not publish designated sustainability reports, nor report such information on their webpages. Remedies to the most frequently mentioned obstacles such as data insufficiency and lack of benchmarks, could include a creation of a ESG database open to the disclosing parties in order to ease the data access for benchmarking purposes. In addition, increased educational effort, which could be performed by, for example, national venture capital associations would raise the investors knowledge on the sustainability matters, which the financiers could then pass on to their portfolio companies.

The importance of this study and proceeding implications is highlighted by the fact that already now sustainability factors are highly integrated in the financiers' decision making processes. The average weight of the sustainability factor impact on the overall investing decision is found to be 0.39 being somewhat higher for banks and asset management companies. This result is surprisingly high given the previously mentioned challenges and lack of knowledge in the field, however signal that further developments in the ESG applications are to be expected.

Finally, contrary to the global tendencies, the majority of the Baltic respondents declined any changes in ESG agenda during the Covid-19 pandemic. While it could be assumed that more pressing, financial issues came ahead of the sustainability during these times, only 14% indicated it to be the case demonstrating that sustainability remains an important factor of the financial investors also in times of the global health crisis.

With respect to the limitations of this study, it should be pointed out that the main aim of the study was to obtain a high level overall picture of the ESG landscape as currently seen by the Baltic financial market players. The results to some of the questions, however, were notably different in the sample sub-groups given the differing investment exposures and geographies by the respondents - asset managers, banks and VC/PE funds. In order to further explore propositions for policy changes mentioned in the study, a suggestion for further studies could therefore be to perform more in-depth evaluations by concentrating on more narrowed samples of the financial industry players, which potentially could provide more focused results.

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Ilze ZUMENTE is a PhD student working at Riga Technical university. Her research interests include sustainable finance, ESG and corporate governance.
ORCID ID: https://orcid.org/0000-0002-9129-458X

Jūlija BISTROVA is a PhD degree holder and assistant professor ar Riga Technical university. Her research interests include corporate finance, corporate governance and capital markets.
ORCID ID: https://orcid.org/0000-0002-5538-7703

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ANALYSIS OF FACTORS AFFECTING E-LOGISTICS SERVICES ON URBAN MANAGEMENT AT HOCHIMINH CITY, VIETNAM

Dinh Tuan Hai [1]*, Nguyen Xuan Quyet [2], Vo Thi Dieu Hien [3]

[1] *Faculty of Urban Management, Hanoi Architectural University, Vietnam*
[2] *Faculty of Business Administration, Hochiminh City University of Food Industry, Vietnam*
[3] *Faculty of Economics, Ho Chi Minh City College of Transport, Vietnam*

E-mails:[1] *haidt@hau.edu.vn (Corresponding author)*

Abstract. Vietnam's logistics industry with an estimated total value of US $ 50-60 billion is currently growing rapidly (20 - 25% per year) and is expected to maintain double-digit growth for at least 5 to 10 next year, due to the breakthrough of the retail industry with high internet penetration and online shopping trends. According to the Vietnam E-Commerce White Paper 2018, the scale of the B2C e-commerce market was US $ 6.2 billion in 2017. Vietnam is one of the fastest growing e-commerce markets in Southeast Asia. With this boom, the demand for logistics in e-commerce ecosystem is huge. Analysis of the factors affecting electronic logistics allows proposing a strategic solution for the development of e-logistics services in Ho Chi Minh City, and what is urgent according the Logistics Development Plan of Ho Chi Minh City until 2025, with a vision to 2030.

Keywords: E-Commerce; E-logistics; Hochiminh City; Logistics; Urban; Vietnam

1. Introduction

Despite being a nation with the advantage of having plenty deep-water ports, the logistics industry has not been able to become a key economic industry due to many limitations. The reason is the non-uniform infrastructure of Logistics industry, which has confined the development of logistics activities. Meanwhile, e-logistics, which is both a tool and a solution for synchronous connecting the infrastructure for Logistics industry and the E-commerce industry, has still not been properly invested and developed (Tuan, 2018).

Ho Chi Minh City (HCMC) is a city with the advanced logistics system and holds the most important position in the Southern key economic zone as well as in the whole country. In the current period of international economic integration, it is necessary to develop a program for the transforming of Logistics into a key economic industry in accordance with the Decision No. 200/QĐ-TTg dated 14/02/2017 of the Prime Minister on the Action Plan. That would enhance competiveness trough increasing quality of Vietnamese logistics services until 2025 (VLA, 2018) and respective progress of E-commerce. However, i) A model allowing to connect e-logistics (as a coordinating center combining logistics and e-commerce) has not yet been formed; the operations of logistics and e-commerce industries thus has their own processes of distributing goods / services, what cause ineffectiveness; ii) The satisfaction level of purchasers via e-commerce channels and using online logistics is still low (HCMPC, 2017).

2. Literature Review

There a lot scientific works and scientific research projects related to e-logictics in urban management. Numerous attempts to integrate e-logistics − e-commerce with current logistics are being made (Vinalog, 2018; Vietnam Industry and Trade Information Center – Vitic, 2018). Some scientists (Giang, 2018) see bright prospects of Vietnam's e-logistics industry. The main logistics companies serving Vietnamese e-commerce market are focused on understanding e-logistics trends in urban management, in particular, which reflects the essential needs of the economy in general (RongViet, 2019). Policies for e-logistics and e-commerce infrastructure are researched by Ha (2018a). According the author, it is necessary to revise the Commercial Law adopted in 2005 and tune it with regulations in e-logistics and e-commerce area in Vietnam (Hy, 2015).

Scholars analyze factors affecting logistics and e-logictics (Vinh, 2007). Earlier Closs (1990) analyzed Logistics Simulation Modeling. According Nghi (2019, Vietnam logistics industry gives 'red alert' of lacking two million workers. Ha (2018b) focuses on a question how the Internet of Things promotes the "revolution" in logistics. Nevertheless, studies about the factors, affecting e-logistics, particularly, in Vietnam are relatively few, fragmented, and seems to have many limitations. Thorough research devoted to e-logistics strategy is still missing.

3. Research Methodology

3.1. Data Collection

The study uses information collected in recent years from relevant studies, reported data, plans, strategies etc. The sources were Vietnam Logistics Association, Vietnam E-commerce Association, leading experts and govermental agencies in Ho Chi Minh City (HCMC) and Vietnam. Apart from the relevant studies mentioned in overview of eralier research, the study also uses information from other research works, including : *1) Domestic research work* of Dao (2011), on development of logistics services in Vietnam under the international integration conditions; research of lam (2012), which is devoted to analysis of experience in developing logistics centers in some countries in the world; work of Phuc (2018), who studied models and investment solutions in building a logistics center serving Hai Phong International Gateway Port in Lach Huyen; research of Hang (2012), tackling the quality issues of logistics services of Vietnamese transport enterprises in Ho Chi Minh City; reserach of Tuan

(2015), who studied governmental management of logistics services in Hai Phong port ; *2) Foreign research works* by Charles (2011), who derived industrial logistics hub reference models for manufacturing based economies. Thereby, synthesis of theoretical and practical knowledge about e-logictics allowed us to build a model of factors affecting e-logistics. We conducted an in-depth survey with 20 leaders of organizations and enterprises and other experts, composed a questionnaire and questioned 200 respondents, what allowed to estimate a role of factors affecting e-logistics.

3.2. Analysis Methods

Descriptive statistics is based on the information and data collected from studies, reports, plans and strategies etc. It allows to analyse and assess the current situation of e-logistics in HCMC by comparing indicators related to e-logistics in HCMC and Vietnam.

Qualitative research: in addition to the reference of previous relevant research models, 200 experts, leaders, managers and employees of companies operating in logistics, e-commerce, express delivery in HCMC from 01/2018 to 03/2018 were used to verify impact of 7 independent variables (29 observed variables) to ensure objectivity and prove the research results.

Quantitative research: from the survey results with 180/200 answered questionaire, the authors used SPSS 22.0 software to analyse data and evaluate impact levels of the factors affecting e-logistics in HCMC.

Based on the results of the analysis current situation of strengths, weaknesses, opportunities, and challenges for e-logistics was performed; SWOT analysis was done with aim to propose strategic solutions for e-logistics Ho Chi Minh City.

4. Data Analysis

4.1. Reliability Analysis of Measured Scales – Cronbach's Alpha

Cronbach's Alpha of "Customers' Perception" Scale. Analysis of Cronbach's Alpha of the independent variable "Customers' Perception" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,709 > 0.6, which was within a good measuring range. The total correlation coefficients (this coefficient indicates the degree of "association" between one observed variable in the factor and the other, and reflects the contribution to the conceptual value of the factor of a particular observed variable) of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, so these 4 variables measuring this factor could be used in the following analyses (Table 1).

Table 1. Reliability Statistics – "Customers' Perception" Scale

Cronbach's Alpha	Number of Observed Variables
0,709	4

Cronbach's Alpha of "Technology and Security" Scale. Analysis Cronbach's Alpha of the independent variable "Technology and Security" including 5 observed variables resulted in the Cronbach's Alpha coefficient = 0,825 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, hence these 5 variables measuring this factor could be used in the following analyses.

Cronbach's Alpha of "Legal Infrastructure" Scale. Analysis Cronbach's Alpha of the independent variable "Legal Infrastructure" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,759 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, hence these 4 variables measuring this factor could be used in the following analyses.

Cronbach's Alpha of "Intellectual Property and Consumer Protection" Scale. Analysis Cronbach's Alpha of the independent variable "Intellectual property and consumer protection" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,757 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, hence these four variables measuring this factor could be used in the following analyses.

Cronbach's Alpha of "Electronic Payment System" Scale. Analysis Cronbach's Alpha of the independent variable "Electronic payment system" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,900 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, hence these four variables measuring this factor could be used in the following analyses.

Cronbach's Alpha of "Human Resources" Scale. Analysis Cronbach's Alpha of the independent variable "Human resources" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,898 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor were all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables was lower than the Cronbach's Alpha coefficient, hence these four variables measuring this factor could be used in the following analyses.

Cronbach's Alpha of "Organization and Administration" Scale. Analysis Cronbach's Alpha of the independent variable "Organization and administration" including 4 observed variables resulted in the Cronbach's Alpha coefficient = 0,865 > 0,6, which was within a good measuring range. The total correlation coefficients of the variables measuring this factor was all above 0,3. Additionally, the Cronbach's Alpha if Item Deleted of all variables were lower than the Cronbach's Alpha coefficient, hence these four variables measuring this factor could be used in the following analyses.

4.2. Exploratory Factor Analysis (EFA)

EFA for the Scale of Factors Affecting E-logistics. The scale of factors affecting e-logistics process consisted of 7 independent variables with 29 observed variables. After the scale was tested with the coefficient of reliability - Cronbach's Alpha, no variables were eliminated, therefore the author used all 29 observed variables in Exploratory Factor Analysis (EFA). The results were as KMO value = 0,727 (0,5 < KMO <1) proved that factor analysis for grouping these variables was appropriate. The Chi-square statistic of Bartlett's test reached 4247,467 and Sig.= 0,000, indicating that the observed variables were correlated on general scope (Table 2). The results from EFA showed the total average variance extracted of 68,965% (>50%), illustrating that these 7 factors could explain 68,965% of the data variance. This was an acceptable result and proved that grouping these factors together was appropriate. Stopping point in factor extraction was the 7th factor with Eigenvalues of 1,645>1, showing the suitability of factor analysing results. The observed variables had satisfactory factor loadings above 0.5 and none of them had factor loadings loading onto two factors simultaneously, therefore the scales reached the convergent value (Table 2).

Table 2. KMO Test of Sampling Adequacy - KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0,727**
Bartlett's Test of Sphericity	Approx. Chi-square	4247,467
	Df	
	Sig.	**0,000**

Recalculate the Coefficient of Reliability Cronbach' Alpha of the Factors. After the exploratory factor analysis (EFA), the author carried out a test to examine the adequacy of the measuring scale with the reliability coefficient Cronbach's Alpha. The demonstrated results of EFA indicated that the observed variables, which had been tested with the reliability coefficient of Cronbach's Alpha and the exploratory factor analysis (EFA) in turn, remained the same initial factor without any changes of the variables. From the results of EFA, 7 factors with 29 observed variables were deduced. After that, the factors were explained and renamed accordingly. Identification and explanation the factors was based on the recognition of observed variables with high factor loadings within the same factor. Hence, this factor could be explained with the variables, which had high factor loading within it. The EFA results also showed that the observed variables in each factor were unchanged, implying that the observed variables initially given by the author all measured the same concept related to the research problem, thus the author renamed them to the identical original names.

Revised Research Framework. The theoretical framework proposed 7 factors affecting e-logistics and 29 observed variables to explain these 7 factors. After testing the scale with Cronbach's Alpha và EFA, the groups of observed variables mostly belong to the unchanged factors. The revised research framework was exactly similar to the proposed one with the remained number of 7 factors and 29 observed variables (Figure 1).
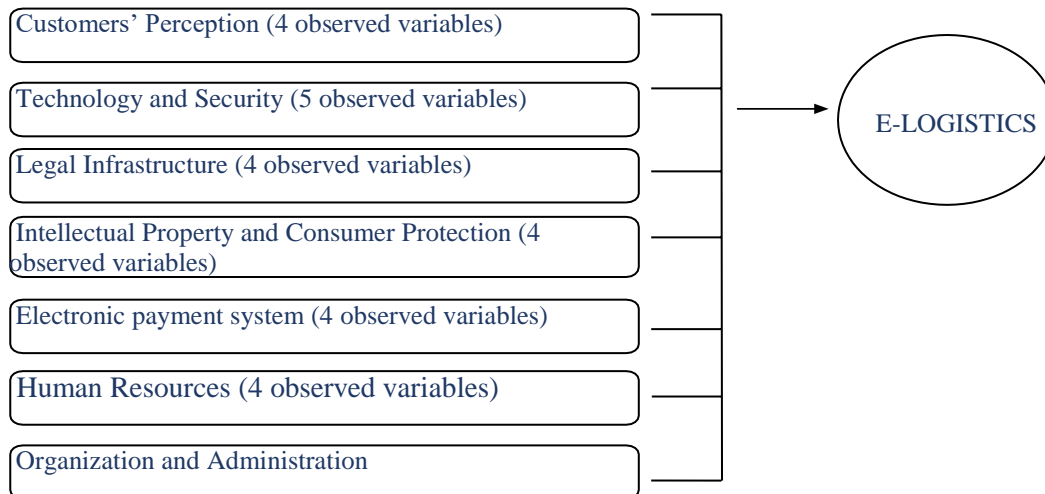
Figure 1. Revised Research Framework

Linear Regression and Model Testing. Linear regression analysed affecting levels of 7 factors: (1) Customers' Perception; (2) Technology and Security; (3) Legal Infrastructure; (4) Intellectual property and Consumer protection; (5) Electronic payment system; (6) Human resources and (7) Organization and Administration. The multiple linear regression equation was applied to study the impacts of independent variables X1, X2, X3, X4, X5, X6, X7 on E-logistics. To analyse the regression equation, the author built its form as follows:

$$Y_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_i$$

With: + Y_i: Result function - E-logistics activities

+ β (0, i = 1÷n): affecting levels

+ X_i : X1- Customers' Perception; X2- Technology and Security; X3- Legal Infrastructure; X4- Intellectual property and Consumer protection; X5- Electronic payment system; X6- Human resources; X7- Organization and Administration – which is the group of factors affecting the development of E-logistics.

$\beta 0$ i, βi: the constant and regression coefficient of the factor i (i = 1, 2, 3, 4, 5, 6, 7 respectively).

The study performed multiple regression by the Enter method: seven independent variables and dependent variable were included once and considered the statistical results related to the research problem. After putting the dependent variable and seven independent variables into regression, all independent variables have Sig. > 0,05, so they were all retained.

- Detecting the violation of necessary assumptions in the regression model: Regression analysis is not just a description of observed data from the overall results. Acceptance and interpretation of regression results are inseparable from assumptions observed in the sample, we have to generalise our conclusions to the relationship between the necessary internal variables and the diagnosis of violated assumptions. If assumptions violated, the estimated results are no longer reliable.

- Assumption of the independence of errors (no correlation between residuals): Durbin – Watson statistics could be used to test the correlation of adjacent errors. Results in Table 3 indicated that the value of Durbin – Watson statistics was 1,687, just under 2, which meant the assumption about no first-order correlations between residuals was accepted.

Table 3. Durbin – Watson Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,816[a]	0,666	0,653	0,04393	1.839
[a] Predictors: (Constant), X7. Organization and Administration, X5. Electronic Payment System, X3. Legal Infrastructure, X6. Human Resources, X4. Intellectual property and Consumer protection, X2. Technology and Security, X1. Customers' Perception					

- There was no multicollinearity: Looking at the Collinearity Statistics column (diagnosis of multicollinearity), variance inflation factors (VIFs) of the independent variables in the model were lower then 2, meaning that multicollinearity did not happen (Table 4).

- Evaluating the adequacy of the regression model: From the results of Table 3. Durbin – Watson Test, it was showed that the Adjusted R Square was 0,653, lower that the R Square of 0,666 and using it to evaluate the adequacy of the regression model would be safer because it did not inflate the model suitability. The Adjusted R Square of 0,653 was higher 0,5, meaning that the linear regression model was formulated in accordance with the data up to 65% and had a fairly good explanatory level. It was also indicated that the relation between the dependent variable and the independent ones was relatively close. In conclusion, the model explained 65,3% of the impact of the factors on E-logistics and the rest of 34,7% was explained by factors outside the model.

Table 4. Multicollinearity Test

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,978	0,024		40.987	0,000		
	X1. Customers' Perception	0,212	0,028	0,192	7.511	0,000	0,828	1.243
	X2. Technology and Security	0,287	0,019	0,322	14.884	0,000	0,854	1.521
	X3. Legal Infrastructure	0,132	0,018	0,489	7.377	0,000	0,864	1.728
	X4. Intellectual property and Consumer protection	0,013	0,013	0,132	1.001	0,018	0,911	1.969
	X5. Electronic Payment System	0,055	0,009	0,477	6.034	0,000	0,810	1.226
	X6. Human resources	0,065	0,010	0,249	6.574	0,000	0,850	1.685
	X7. Organization and Administration	0,050	0,010	0,600	5.079	0,000	0,839	1.191

- Testing the adequacy of the model: Analysis of Variance (ANOVA) (Table 5) gave the F value with Sig. = 0,000 ($< 0,05$), which meant the regression model was adequate to the collected data and the variables in the model all had statistically significance with the significant level of 5%. The F value of 49,028 was used to test H0 hypothesis: the regression coefficients of the independent variables $\beta1= \beta2= \beta4= \beta5= \beta6= \beta7=0$ (there was no linear relationship between the independent variables and the dependent variable). As Sig. = $0,000 < 0,05$, we rejected H0 hypothesis. Thus, the independent variables in this model had the relationships with the dependent variable.

Table 5. Anova[a] "Elogistics"

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	0,662	7	0,095	49.028	0,000[b]
	Residual	0,332	172	0,002		
	Total	0,994	179			
[a] Predictors: (Constant), X7. Organization and Administration, X5. Electronic Payment System, X3. Legal Infrastructure, X6. Human Resources, X4. Intellectual property and Consumer protection, X2. Technology and Security, X1. Customers' Perception [b] Dependent variable: Elogistics						

- Regression equation: According to the objective and the topic of the study, the author chose a standardized regression coefficient (beta coefficient) to formulate the regression equation. From table 4, all variables were statistically significant with the values of Sig. = 0,000 ($< 0,05$). Therefore, there were 7 factors affecting E-logistics based on the standardized regression coefficient (beta). The comparison of the β' value showed that factor "X2. Technology and Security" had the biggest impact on E-logistics with β'2 = 0,322; respectively the second and third affecting factors were "X1. Customers' Perception" with β'1 = 0,192 and "Legal Infrastructure" with β'3 = 0,489; while the fourth and fifth influencing factors were "Human resources" with β'6= 0,249 and "Electronic Payment System" with β'5 = 0,477; the sixth affecting factor was "Organization and Administration" with β'7 = 0,600 and the seventh factor was "Intellectual Property and Consumer Protection" with β'4 = 0,132.

From the above result, the equation illustrating the factors affecting e-logistics was:

$$Y = 0,978 + 0,192*X1 + 0,322*X2 + 0,489*X3 + 0,132*X4 + 0,477*X5 + 0,249*X6 + 0,600*X7$$

Hence, the linear regression model built from Y equation did not violate the necessary assumptions in linear regression. Based on the results of linear regression analysis, the author concluded that all the hypotheses of X1, X2, X3, X4, X5, X6, X7 were accepted with the statistical significance of 5% and the relationship between each factor and "ELOGISTICS" was direct proportion.

4.2.1. Descriptive Statistics with Likert Scale of the Factors Drawn From the Regression Analysis Results

In order to have a basis for building solutions to identify factors affecting E-logistics, the author analysed the students' assessments of each variable in the factor groups extracted from the multiple regression model.

- *"Customers' Perception" factor:* The descriptive statistics result of Likert scale for the factor "*Customers' Perception*" was rated above average (5 points/2=2,5 points) with the minimum of 4,0167 points. In "Customers' Perception", H11 *"Demand for online shopping and transaction"* was the highest rated factor with the average score of 4,6667 points.
- *"Technology and Security" factor:* The descriptive statistics result of Likert scale for the factor "*Technology and Security*" was rated above average – the lowest was 3,9833 points. In "Technology and Security", The factor of H25 *"Information security of online transactions"* was rated the highest with the average score of 4,6667 points.
- *"Legal Infrastructure" factor:* The descriptive statistics result of Likert scale for the factor "*Legal Infrastructure*" was rated above average with the minimum of 4,1056 points. In which, H34 *"Procedures for resolving and handling disputes"* was rated the highest with the average score of 4,6667 points.
- *"Intellectual Property and Consumer Protection" factor:* The descriptive statistics result of Likert scale for the factor "*Intellectual Property and Consumer Protection*" was rated above average and the lowest was 3,9667 points. In which, H42 *"Safety and confidentiality of customer information"* was the highest rated factor with the average score of 4,6222 points.
- *"Electronic Payment System" factor:* The descriptive statistics result of Likert scale for the factor "*Electronic Payment System*" was rated above average – the minimum was 4,3722 points. In which, the factor of H52 *"Suitable forms of payment for customers"* was rated the highest with the average score of 4,6944 points
- *"Human Resources" factor:* The descriptive statistics result of Likert scale for the factor "*Human Resources*" was rated above average with the lowest score of 3,9611 points. In "Human Resources", the factor of H63 *"Training human resources for the industry"* was rated the highest as its average score was 4,6056 points.
- *" Organization and Administration" factor:* The descriptive statistics result of Likert scale for the factor "*Organization and Administration*" was rated above average – the lowest score was 4,0167 points. In which, H74 *"Administration of E-logistics distributing channels"* was rated as the highest factor with the average score of 4,4278 points.

To sum up, analysis of descriptive statistical survey data preliminarily shows experts' evaluation of factors affecting E-logistics at a high level. This explained that E-logistics activities are affected by 7 factors above. Meanwhile, to develop E-logistics, it is necessary to pay more attention to the 7 impacting factors, with details of important factors as follows: H11 *"Demand for online shopping and transaction"*; H25 *"Information security of online transactions"*; H34 "*Procedures for resolving and handling disputes*"; H42 "*Safety and confidentiality of*

customer information"; H52 *"Suitable forms of payment for customers"*; H63 "*Training human resources for the industry*" and H74 *"Administration of E-logistics distributing channels"*

4.3. Strategies and Solutions for Development of E-logistics in Ho Chi Minh City

Based on the study results of 7 factor group affecting e-logistics strategies and solutions for developing e-logistics can be formulated. Hence, the research team proposed a number of strategic solutions for e-logistics development in HCMC as provided below.

4.3.1. Building an E-logistics Model with the Connection of E-commerce Activities and Multi-logistics Methods in the Fourth Industrial Revolution

The creation of an e-logistics model connecting e-commerce activities with multi logistics methods in the Fourth Industrial Revolution (4IR) (Figure 2) brings great new chances to Vietnam in general, and to HCMC particularly. 4IR can shorten the process of industrialization and modernization by anticipating and leapfrogging to the development of higher technology level.

In the e-logistics model, e-logistics center is the core component of the system, playing a particularly important role for the efficiency of e-logistics activities; optimizing reserve levels; ensuring customer service quality; minimizing flow time of goods; reducing e-logistics costs. Additionally, the operation of e-logistics centers are necessary to archieve the socio-economic goals, such as: More effective supply chain management; Assuring efficient transfer of goods transported with various methods of transportation; Optimizing the utilization of global and national transportation systems; Supporting the local, national and regional socio-economic development through effectively responding to e-logistics activities for the production and trading of goods and services.

The basic functions and responsibilities of an e-logistics center are composed of: i) The solution of connecting and transporting; ii) The solution of storage; iii) The solution of loading and unloading goods; iv) The solution of collecting goods; v) The solution of dividing and selecting goods, which constrasts with collecting goods by separating goods into smaller lots; vi) The solution of optimal stock; vii) The solution of reserve logistics.

Apart from that, e-logistics center is also the place to carry out customs procedures, customs clearance, goods control and inspection etc., as well as other governmental managing functions in accordance with the regulations of domestic and international e-logistics activities.
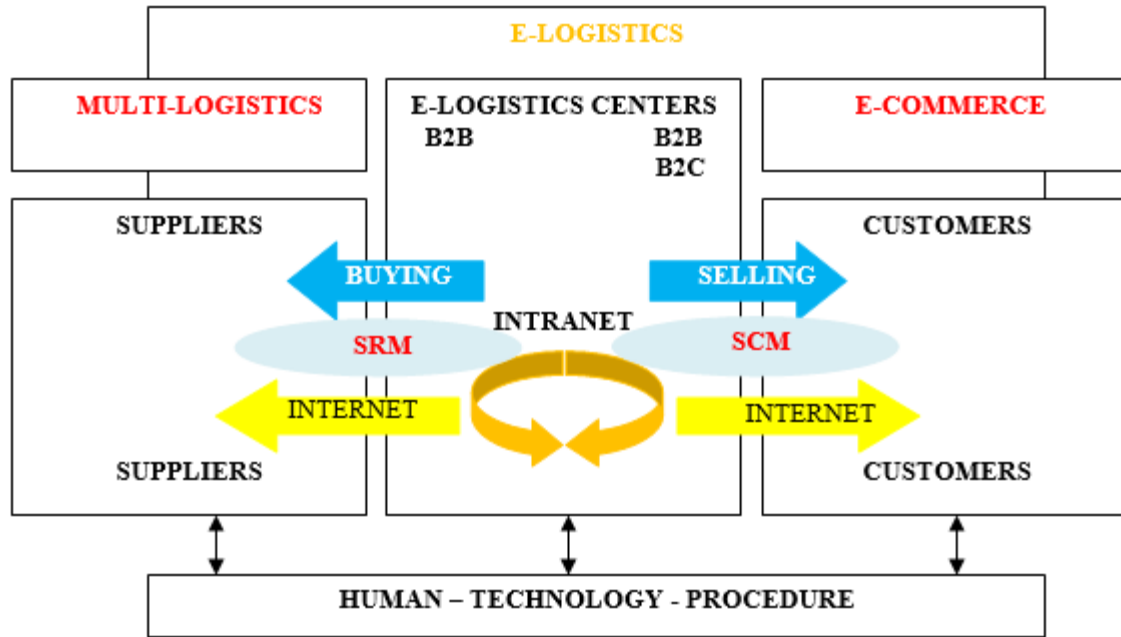
Figure 2. The E-logistics Model
Source: the authors

4.3.2. Promoting Investment in Science and Technology Application Following the Trend of Forming E-logistics Industry, Adopting Policies to Support E-Logistics Enterprises in Terms of Invested Capital and Encouraging the Involvement of High-tech Enterprises

From the policies of the People's Committee of HCMC on the application of 4IR, it is an opportunity for the growth of e-logistics and security technology, connecting and applying logistics network, and express delivery. Investing in the technology of virtual reality (VR) and augmented reality (AR) connects e-logistics and e-commerce. In order to improve the efficiency of e-logistics activities, optimizing the process, thus enhancing the reliability in online transactions; Internet of Things (IoT), can be integrated with warehouses through sensors installed on shelves, goods. In addition, artificial intelligence (AI) technology helps develop self-learning capacity, serve to analysis and make predictions in the industry. Therefore, it is necessary to promote investment in the application of science and technology, to catch up with the international level following the trend of forming the e-logistics industry. Ho Chi Minh City needs to have policies to support a part of investment capital for E-logistics enterprises and policies to encourage high-tech companies to have different types of leases so that the enterprises do not have to spend a great amount of initial capital on technology.

4.3.3. Building Logistics Centers, Combining with the Completion and Synchronization of E-logistics Infrastructure

Recognizing the importance of logistics service industry, the People's Committee of Ho Chi Minh City has assigned the HCMC Department of Industry and Trade to lead the building of a Logistics development Plan to 2025, with a vision to 2030. Based on the assessment of current situation along with researching international experience, the Plan needs to offer effective solutions to develop logistics into a key service industry of the city, a focal point of the region and to contribute to the reduction of logistics costs. Accordingly, planning of the city logistics industry is necessary to focus on infrastructure development, which determines the location and scale to establish of three logistics centers in order to connect goods transport between Ho Chi Minh City and other

localities. This task must meet two requirements: the first one is the storage, transshipment and supply of goods for the distribution chain of the inner city; while the second requirement is a transshipment, distribution of goods between Ho Chi Minh City and other provinces, cities, import-export goods through the city gateway (HCMPC, 2017).

4.3.4. Exploiting the Industry-focused Enterprises Network with Diversified Forms of Online Transactions, in Order to Share and Jointly Utilize the Industry Resources

The deficiencies of capital and human resources are the two basic factors, which result in the incompetency of domestic logistics enterprises compared to foreign companies. Apart from that, the application of information technology is also restrained, most of the websites of domestic Logistics enterprises lack the utilities that customers need such as order tracking, document tracking, ship/train schedule, e-booking etc. Currently, domestic companies are striving to upgrade the supply of logistics services to 3PL; to develop e-logistics and to manage effectively the supply chain. Several enterprises have also been involved in specific 3PL strategic models such as Vinafco, Saigon Newport Coporation, Transimex, ITL, Gemadept and Vinalink (Nam, 2018). Therefore, Ho Chi Minh City needs to strengthen the exploitation of the industry-focused enterprise network through the establishment of e-logistics centers, combining with the development and application of science and technology into e-logstics, with a variety of online transactions so as to share and take advantage of the industry resources.

4.3.5. Increasing Trainings, Improving the Quality of Human Resources in the Industry, Fostering Human Resources of the Enterprises

In Ho Chi Minh City from 2018 to 2025, the demand for human resources of economic sectors is about 100,000 workplaces, accounting for 30% of the total demand for human resources, of which logistics needs about 18,000-20,000 people per year, including 25% of empoyees from universities, 30% from colleges, 25% from vocational schools and 20% from primary vocational schools. Thus, HCMC should develop a two-way linkage model between the enterprises and educational institutions, enhance the quality of human resources, construct and standardize the training programs for e-logistics (Tuan, 2015; Quyet and Lan, 2020).

4.3.6. Completing the Legislation on E-logistics

Nowadays, the concept of logistics and e-commerce is broad and covers many aspects of administration. Therefore, there must be a complete and strict legal corridor to create conditions for the expansion of e-logistics services in general as well as e-commerce and logistics. Accordingly, it is necessary to amend and supplement the contents of e-logistics in the Commercial Law, the laws on e-transactions, towards the law of e-commerce, logistics, and e-logistics. In addition, there are many agencies involved in management, but a joint operating agency on e-logistics has not been found yet. In order to facilitate the development of these activities, the authority managing logistics services should set up an intersectoral coordinating committee on e-logistics (from relevant functional departments). This will help the industry management to be more effective, contributing to accelerating the growth of e-logistics service industry (Trang, 2018; Robeson and Copacino, 2011).

5. Conclusions and Recommendations

The results of linear regression analysis have revealed that e-logistics is affected by 7 groups of factors: 1) Customers' perception; 2) Technology and security; 3) Legal infrastructure; 4) Intellectual property and consumer protection; 5) Electronic payment system; 6) Human resources; 7) Organization and administration. At the same time, in order to develop e-logistics, it is necessary to pay more attention to the above 7 affecting factors, with the important details as follows: i) Demand for online shopping and transactions; ii) Information security of online

transactions; iii) Procedures for resolving and handling disputes; iv) Safety and confidentiality of customer information; v) Suitable forms of payment for customers; vi) Training human resources for the industry; vii) Administration of E-logistics distribution channels (Quyet and Hai, 2020; Van, 2020). The research contributes to the systematization of the theoretical basis related to electromagnetic logistics (e-logistics), which is a reference for students, students of logistics, e-commerce, express delivery, transportation etc., as well as providing scientists with references for the next research directions in this field in the city Ho Chi Minh City and Vietnam.

Along with the analysis of current situation, the research team has proposed a number of strategic measures for the development of e-logistics in HCMC, including: 1) Building an e-logistics model with the connection of e-commerce activities and multi-logistics methods in the Fourth Industrial Revolution; 2) Promoting investment in science and technology application following the trend of forming e-logistics industry, adopting policies to support e-logistics enterprises in terms of invested capital and encouraging the involvement of high-tech enterprises; 3) Building logistics centers, combining with the completion and synchronization of e-logistics infrastructure; 4) Exploiting the industry-focused enterprises network with diversified forms of online transactions, in order to share and jointly utilize the industry resources; 5) Increasing trainings, improving the quality of human resources in the industry, fostering human resources of the enterprises; 6) Accomplishing the legislation on e-logistics. The research still has certain limitations: *Firstly*, this study was conducted only in Ho Chi Minh City, so the research results are of practical value only to the locality. For other schools or for other localities in particular and Vietnam in general, the results may be different. *Second,* for the collection of information was done by distributing the survey form directly to the respondents. In this process, although the authors tried to explain to the respondents, the phenomenon of dishonest, inaccurate, and non-objective answering, alas there are no guaranties, that all the risks were avoided. *Third,* researchers encountered time constraints and other restrictions. As the result, the study is conducted with a relatively small number of samples, so it does not completely reflect the factors affecting e-logistics services in the city Ho Chi Minh. These shortcomings can serve as suggestions and orientations for the next research to overcome and complete.

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Dinh Tuan HAI is an Associate Professor at Faculty of Urban Management, Hanoi Architectural University. His research interests are as Urban management, Application of E-logistics on urban management and Logistics in general for urban and economics.
ORCID ID: 0000-0002-3687-8566

Nguyen Xuan QUYET is an Assistant Professor at Faculty of Business Administration, Hochiminh City University of Food Industry, Vietnam.
ORCID ID: 0000-0003-1275-2835

Vo Thi Dieu HIEN is a teacher at Faculty of Economics, Ho Chi Minh City College of Transport, Vietnam.
ORCID ID: 0000-0002-9315-4740

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INTRINSIC ALIGNMENT WITH STRATEGY AS A SOURCE OF BUSINESS SUSTAINABILITY IN SMES[*]

Romel Ramón González-Díaz [1] , Santos Lucio Guanilo Gómez [2], Ángel Eduardo Acevedo-Duque [3], Jorge Suárez Campos [4], Elena Cachicatari Vargas [5]

[1]*Centro Internacional de Investigación y Desarrollo (CIID) Montería, Colombia*
[2,5] *Universidad Nacional Jorge Basadre Grhomann-Tacna, Peru*
[3] *Observatory of Public Policies, Autonomous University of Chile, Santiago 7500912, Faculty of Business and Administration. Santiago, Chile*
[4]*Facultad de Humanidades, Universidad Mayor de Chile, Santiago 7500994, Chile*

[1] director@ciid.com.co ; [2] lguanilog@unjbg.edu.pe ; [3] angel.acevedo@uautonoma.cl ; [4] jorge.suarez@umayor.cl
[5]ecachicatariv@unjbg.edu.pe

Abstract. This article presents an analysis of the degree of intrinsic alignment with the strategy as a source of business sustainability in the SMEs dedicated to the manufacturing sector in the region of Tacna, Peru. It was framed in a non-experimental research design of field-transaction, a survey was applied (questionnaire with 32 items with a Likert scale validated in the opinion of 3 experts with an Alpha Cronbach coefficient of 0.95(Excellent) to a random sample of 247 directors and managers. The data were analyzed through the descriptive statistics (SPSS25) to know the behaviour of the variables under study. In order to test hypotheses, the chi-square statistic was applied (categorical variables, ordinals and unit of analysis greater than 30 subjects). The main findings show that the degree of intra-strategy alignment is 4.46 (excellent alignment of the Intrinsic with the strategy) and business sustainability resulted in 4.23 (high business sustainability). In conclusion, there is a relationship between the intrategy alignment and business sustainability in the SMEs of the manufacturing sector of the Tacna-Peru Region with a strength of 0.691 (strong relationship).

Keywords: Intrategy; strategy; business sustainability; SMEs; Covid-19; Industry 4.0

1. Introduction

The world is currently in the throes of a devastating health crisis and possibly unprecedented in recent decades, COVID-19 has one of the highest reproductive rates (1.5 to 3.5) that has ever challenged governments. To minimize this SARS-CoV-2 reproductive rate, Latin American governments have bet on social isolation measures to mitigate the wave of contagion that is putting public health systems in check. These actions have not only limited human interaction but have also fractured national productive systems (Khan & Shanks, 2020; Yaya, Yaya, Otu, Otu, & Labonté, 2020, Perret, & García, 2020; González-Díaz, Acevedo-Duque, Salazar-Sepúlveda, & Castillo, 2021).

The productive sector of goods and services has experienced a deep crisis that has generated an increase of more than 47.6% in the mortality rate of Latin American Small and Medium Enterprises (SMEs) (Brás-Dos-Santos & Ramos Silva, 2020; Radicic, Pugh, & Douglas, 2020, González-Díaz, Acevedo-Duque, Gómez, & Cachicatari Vargas, 2021). However, there are SMEs that have reinvented their processes and have rethought on the basis of the new challenges of modernity and have balanced the theoretical aspects of strategic management with management practice (Peralta Miranda, Cervantes Atia, Salgado Herrera, & Espinoza Pérez, 2020; Vörösmarty & Dobos, 2020). In other words, to achieve this balance and overcome the new challenges of modern society, it is necessary to align internal and external aspects of SMEs to achieve effectiveness, productivity and finally, value creation, without losing sight of their peripheral vision, research, development and innovation (Elbanna, Al Katheeri, & Colak, 2020; Filipishyna, Hryshyna, Zhuvahina, Ponedilchuk, & Paska, 2020).

Deconstructing the key elements of a strategic business planning will allow revealing the neuralgic aspects intervening in the sustainable development of the SME, through a prospective retro analysis it is possible to leave in evidence the elements that confer value to the economic entity (Slavik, Hanak, & Hudakova, 2020; Virglerova, Addeo, & Zapletalikova, 2020; Vizzon, Do Carmo, Ceryno, & Fiorencio, 2020). Hence, every SME needs to analyze the economic impact of management decisions (strategy), also needs to analyze how management decisions affect the unit level of the company (intrategy). Since management decisions have an impact not only on the economic outcome (profit), but also on the organizational outcome (unity), managers must evaluate their decisions from both strategic and intrinsic perspectives (Virglerova, Addeo, & Zapletalikova, 2020, Ullah, Wu, Mehmood, Jabeen, Iftikhar, Acevedo-Duque, & Kwan, 2021). Shareholders must share their interests with those of the employees, because only companies capable of achieving a high profit and unity level will survive in the long term (Sánchez, Villavicencio, & Díaz, 2020).

In this sense, the alignment of the internal components (intrinsic) and external components (strategic) that the SME has, provides the dynamics of management and ensures its growth and sustainable development by creating value (Slavik, Hanak, & Hudakova, 2020; Virglerova, Addeo, & Zapletalikova, 2020; Vizzon, Do Carmo, Ceryno, & Fiorencio, 2020, González-Díaz, Becerra-Peréz, & Acevedo-Duque, 2020). By virtue of the above, it has become evident in the SMEs of the manufacturing sector in the Tacna-Peru Region that there are imbalances in their intrinsic and strategic alignment processes as a result of the health crisis (SARS-CoV-2) and it has been reflected in the studies presented by Bessa and Luz (2020); Singh and Singh (2020), which has resulted in a temporary closure of production centres, not having the option to access teleworking and has led to their definitive closure.

Therefore, this study aims to analyze the process of intrinsic alignment with the strategy as a source of business sustainability in the SMEs of the Tacna-Peru Region, which allows generating an analysis, reflection and at the same time a starting point to deepen it, enriched with new factors, by the new challenges of globalization(González-Díaz & Becerra-Perez, 2021). For the analysis, the map of processes has been taken as a structure, which counts every organization, whether public or private, through a Newtonian relationship and

through its three main blocks: the strategic, operative and support processes (Herrera & Gómez, 2012, Vimal, Kandasamy, & Duque, 2021).

Alignment is a common concept related (automotive mechanics) to the angular adjustments of tires for any reason during their useful life, this caused by various serious physical causes (shocks). Therefore, the process of alignment and balancing allows for an improvement in the performance of the wheels and the running of the vehicle. In other words, the alignment of business components (intrinsic and strategic) guarantees the proper functioning of the entity, by addressing the key processes of the administration such as planning, organization, management and control in the dynamics of the organizations (Gloria, Oscar, Mario, & Roxani, 2020; Peralta Miranda et al., 2020; Ramírez, Lay, & Sukier, 2020).

The creation of economic value for the shareholders of SMEs is one of the purposes of corporate financial management. However, to create a degree of commitment, loyalty and improve the production processes of factories, it is required to create value by integrating the actors that make life of the entity, thus ensuring business sustainability. To this end, this research presents a reflection that allows for the relationship between the strategy and the strategy to promote business sustainability in the manufacturing sector in the Tacna-Peru Region.

2. Review of Scientific Literature

This section presents a review of the scientific literature in terms of the components: intrategy, strategic and business sustainability. A precise conceptual and operational definition of these components is presented.

2.1. Intrinsic strategy

After reviewing the main databases (SCOPUS, WOS, SPRINGER), it was not possible to observe a conceptual definition of this word. However, it was possible to find the work presented by Soriano and Albiol (1998), who refers to the fact that the "intrinsic strategy" analyzes the impact of management decisions at the level of the organizational unit of the company. On the other hand, Petit Torres and Gutiérrez González (2007) and Cardona (2001) consider that strategies are management practices that have increased the level of unity in various companies. These strategies, if they are well aligned with the strategy of the SME, increase the capacity of the SME to achieve high performance and long life (González-Díaz, Gómez, et al., 2021; González-Díaz & Ledesma, 2020; Hernández-Julio et al., 2020).

The strategy lists seven of these practices: job security, selective hiring, decentralization of decision making, contingent compensation, extensive training, few differences in status, and extensive financial and performance reporting (Cardona, 2001). This author warns that, for these practices to be successful, they need to be, first, internally consistent with each other and, second, externally consistent with the strategy. For the purpose of this study, strategy is studied under the three fundamental processes: 1) intrinsic strategy processes: this refers to the set of processes related to management decisions, 2) Support processes: these are the ones that coordinate the development and life cycle of the activities contained in the main processes, that is, the organizational processes and support the other processes, and 3) Operational processes: 3) Operational processes: they refer to the map of processes, together with the strategic processes and the support processes, they are those that are directly linked to the provision of the good or service to the client, such as the manufacturing of the product, the purchase management, the order system, the own attention(González-Díaz et al., 2020; González-Díaz, Gómez, et al., 2021).

2.2. Business strategies

According to the scientific literature according to Finoti, Toaldo, Schwarzbach, and Marchetti (2019); Kiseleva, Sadovnikova, Karmanov, Kuznetsov, and Gasparian (2019); Muramalla and Al-Hazza (2019) agree that business strategies are a set of actions argued in terms of business objectives, supported by three fundamental elements: The diagnosis (What is happening here?); policies that guide; and coherent actions. The strategist will have to choose which activity or activities he will dedicate his maximum effort to and face all the possible adversities or obstacles that will arise. As Kiseleva et al. (2019) say, it is a gamble, and that option to which he has bet must be the best, in his opinion and real criterion, therefore he will need to put all his efforts in order to achieve those objectives. The obstacles that may arise are related to government policies, competitor strategies, client decisions, changes in the environment, among others.

2.3. Intrinsic Alignment

To build a solid strategy that allows overcoming the challenges of growth and development considers that every managerial decision has, whether it wants or not, strategic consequences in terms of greater or lesser economic or social benefit and intrinsic consequences in terms of optimization of its resources, highlighting the main driver as it is the workforce, followed by technology (Saiz-Álvarez, Vega-Muñoz, Acevedo-Duque, & Castillo, 2020, Lima & Dallari, 2020; Peralta Miranda, Cervantes Atia, Salgado Herrera, & Espinoza Pérez, 2020). The elaboration of a business action plan must be supported by the organizational needs and a clear articulation of the intrinsic and strategic (Cardona, 2001). In this research, the alignment between the intrinsic and the strategic marks a synergy that benefits the business action because the organizational unit responds effectively to the vicissitudes of modernity. Otherwise, the SME is immersed in incompatibilities between operational, tactical and strategic guidelines.

2.4. Corporate Sustainability

Lesnikova and Schmidtova (2020), Sukawati, Riana, Rajiani, and Abbas (2020) agree that business sustainability is a multidimensional concept and is not solved by a single corporate action. Companies are faced with the challenge of minimizing waste from ongoing operations and preventing pollution, along with the reorientation of their portfolio of competencies towards more sustainable technologies and technologically clean competencies. On the other hand, Lee (2020) believes that the company that creates value at the level of strategies and practices moves towards a more sustainable world with a degree of operational efficiency and that proactive measures in the environment can produce long-term gains.

In this research, corporate sustainability focuses on developing a human-scale profitability formula that, by connecting with all stakeholders and the natural environment, operates in tune with social progress and in harmony with planetary limits by focusing on reasonable returns and profits, rather than steady growth (Ahlström, Williams, & Vildåsen, 2020; Prasad, Acevedo-Duque, Argüello, Pineda, & Turcios, P. 2020, Mishra, & Bapat, 2019). In other words, SMEs with business sustainability have multiple orientations (environmental, social, governance and financial), ensuring long-term business success, contributing to economic and social development and protecting the environment (González-Díaz, Acevedo-Duque, et al., 2021).

3. Methodology

In the present study, it was framed in a non-experimental research design of field – transversal (González-Díaz & Hernández-Royett, 2017; González-Díaz & Polo, 2017). A survey was applied (questionnaire with 32 items with a Likert scale validated in the opinion of 3 experts with a Cronbach's Alpha coefficient of 0.95(Excellent) to a random sample with a margin of error of 5% with a confidence level of 95%, for a total of 247 directors and managers of SMEs in the manufacturing sector of the Tacna-Peru Region. The data were analyzed through descriptive statistics (SPSS25) to know the behaviour of the variables under study. Likewise, to test hypotheses, the chi-square statistic was applied (categorical variables, ordinals and unit of analysis greater than 30 subjects), according to the following system:

- H0= There is no relationship between the Intrinsic alignment and business sustainability SMEs in the manufacturing sector in the Tacna-Peru Region.
- H1= There is a relationship between the Intrinsic Alignment and the sustainability of the manufacturing SMEs in the Tacna-Peru Region.
- Asymptotic significance (bilateral): 0.005
- If H1 is accepted, the contingency coefficient is considered to measure the intensity of the relationship between variables.

Additionally, the criteria for data interpretation are presented in the following table 1.

Table 1. Interpretation Criteria Results

Cut-off points	Data range	Interpretation	
		Intrathegic Alignment	**Business Sustainability**
1	1,00-1,80	Poor Intrathegic Alignment	Poor business sustainability
2	1,81-2,60	Low Intrathegic Alignment	Low business sustainability
3	2,61-3,40	Regular Intrathegic Alignment	Regular business sustainability
4	3,41-4,20	High Intrathegic Alignment	High business sustainability
5	4,21-5,00	Excellent Intrathegic Alignment	Excellent business sustainability

4. Analysis and discussion of results

Once the data was collected, the results were analyzed and discussed with the intention of analyzing the variables: intrategy alignment and business sustainability. For this purpose, the analysis of the results on the intra-strategy alignment is initially presented through the degree of alignment of the Intrastrategy with the strategy of the SME. Then an analysis of business sustainability is made from the perception of the managers of the SMEs dedicated to manufacturing. Finally, the test statistic (chi-square) was applied to determine the existence of a relationship between the variables mentioned above. Likewise, the contingency coefficient was applied to determine the strength of the relationship between the variables.
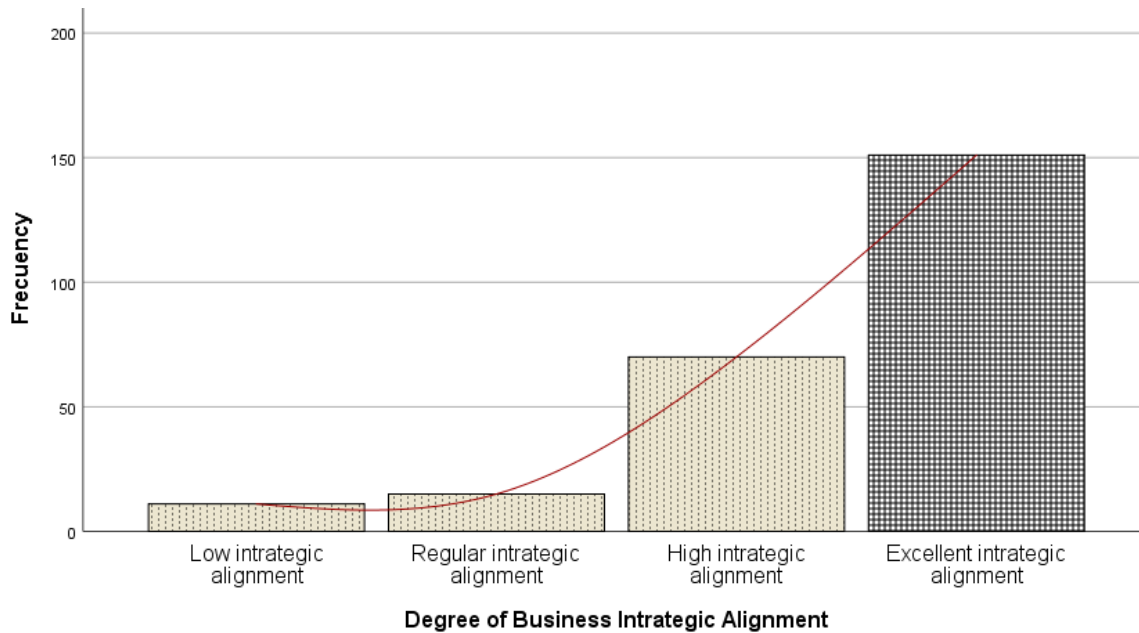
Figure 1. Degree of Business Intrategy Alignment in SMEs

Figure 1 shows the degree of strategic business alignment in the SMEs dedicated to manufacturing in the city of Tacna, Peru, which is concentrated in 61.1% (excellent), 28.3% (high), 6.1% (regular) and 4.5% (low) Intrinsic alignment. Additionally, it presents as a minimum data: 2 and maximum data: 5, with a standard deviation of 0,800 for an average of 4,46 and according to the table 1 referred to the criteria of interpretation of the results it is categorized as an excellent alignment of the Intratégica with the strategy of the SMEs of the manufacturing sector. According to Lima and Dallari (2020); Peralta Miranda, Cervantes Atia, Salgado Herrera, and Espinoza Pérez (2020) agree with these results because the SMEs with an alignment of their organizational unit with the institutional directions confer organizational synergy with a coupling characterized by loyalty and commitment to the entity.

However, there are studies such as Arroyo-Huayta, Cruces-Raimudis, Viacava-Campos, Leon-Chávarri, and Aderhold (2021); Durand-Sotelo, Monzon-Moreno, Chavez-Soriano, Raymundo-Ibañez, and Dominguez (2020); Huallpa, Vera, Altamirano, Raymundo, and Moguerza (2019) who agree that in Peru, the production systems of SMEs dedicated to manufacturing do not keep their strategies aligned with the strategies, which has generated a delay in organizational adjustments due to the economic crisis that is currently submerging the world with the pandemic.

Based on this, the researchers of this study reflect on this divergence and agree that sometimes managers or leaders of SMEs in the region of Tacna, Peru, have been associating the concept of intrategy as an implicit part of the improvised actions to respond to SMEs, because the newspaper Gestión (2020) in a joint statement between the Association of SMEs, Lima Chamber of Commerce, Confiep, Perucamaras, Amcham and the regional chambers of Ica, Cajamarca, Arequipa, La Libertad, Tacna and Lambayeque, expressed their commitment to the economic and productive reactivation, recognizing the diverse organizational problems given by the confinement measures and the emergence of teleworking which has been a relevant strategy in the service sector, a situation that has not benefited the manufacturing sector (Cespedes-Pino, Hurtado-Laguna, Macassi-Jaurequi, Raymundo-Ibañez, & Dominguez, 2020; Henríquez-Alvarado, Luque-Ojeda, Macassi-Jauregui, Alvarez, & Raymundo-Ibañez, 2019; Huallpa, Vera, Altamirano, Raymundo, & Moguerza, 2019).
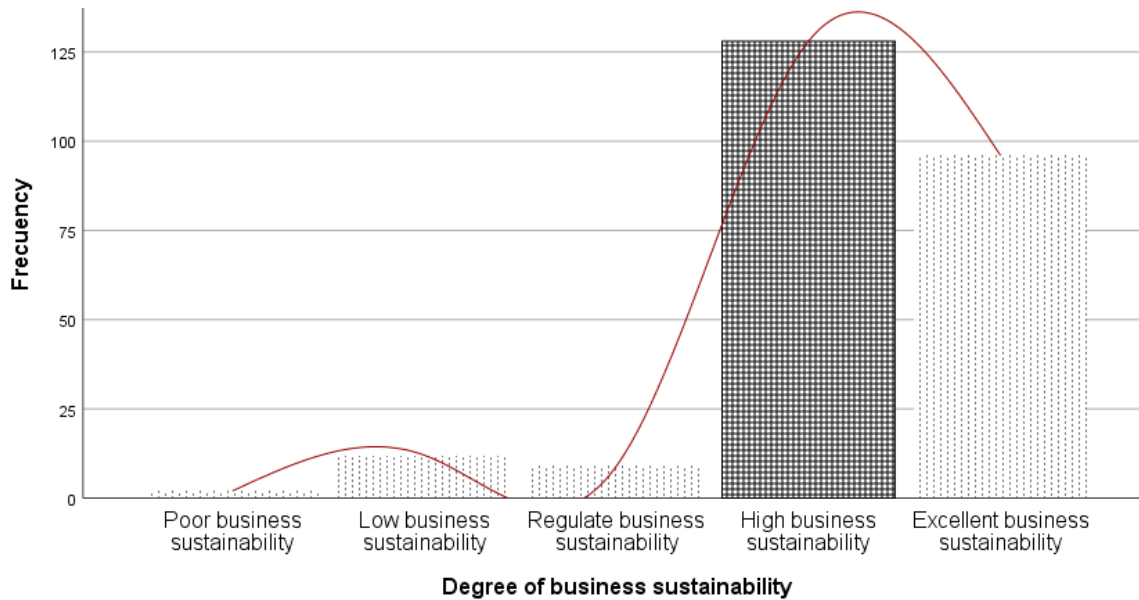
Figure 2. Degree of business sustainability in SMEs

Figure 2 shows the degree of business sustainability of SMEs in the Tacna region of Peru, which is concentrated in 51.8% (high), 38.9% (excellent), 4.9% (low), (3.6%), and (0.8%). Likewise, it presents as a minimum data: 1 and a maximum data: 5, with a standard deviation of 0.801 and an average of 4.23 and according to table 1 referring to the criteria of interpretation of the results it is categorized as High business sustainability of the SMEs of the manufacturing sector. These results coincide with the ideas of Peñaflor-Guerra, Sanagustín-Fons, and Ramírez-Lozano (2020), who consider the dichotomy between ethics and social sustainability.

According to Agenda 2030, Peru is committed to eradicating poverty, protecting the planet and ensuring prosperity through the 17 Sustainable Development Goals (SDAs), as a clear guide for action on global needs in solutions with a shared vision. In this context, Hannan et al. (2020) and Fuentes et al. (2019) consider that in order to achieve the ODS, not only public agencies must be committed, but also SMEs must be involved in the production chain, in order to provide a favourable dynamic for the country's economic development. Consequently, the manufacturing sector has been fractured by the confinement measures taken by the Peruvian government on the occasion of the COVID-19. Therefore, the managers and/or directors of the SMEs in the manufacturing sector assume empirical sustainability policies in the development of their productive activities.

Once the descriptive statistics were applied, Pearson's Chi-square test statistic was calculated in order to find out if there is a relationship between the degree of intrinsic alignment and business sustainability in the SMEs, for which the following result was obtained as described in table 2.

Table 2. Calculation of chi-square test statistics and contingency coefficient

	Value	Mexico City	Asymptotic (bilateral) significance
Pearson's Chi-square	225,164ª	12	,000
Reason for plausibility	148,705	12	,000
Linear-to-linear association	121,332	1	,000
Contingency coefficient	,691		,000
N of Valid cases	247		

a. 11 boxes (55.0%) have expected a count less than 5. The expected minimum count is .09.

Table 2 shows the symmetric measures and the results of the chi-square test with an asymptotic (bilateral) significance of 0.000 less than the accepted significance level (0.005). Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted, which establishes that there is a relationship between the Intrinsic Alignment and business sustainability in the SMEs of the manufacturing sector of the Tacna-Peru Region. Depending on the existence of a relationship, the contingency coefficient was calculated to measure the strength of this relationship, which resulted in 0.691 (strong relationship). Likewise, this relationship can be seen in a more extensive way in figure 3.
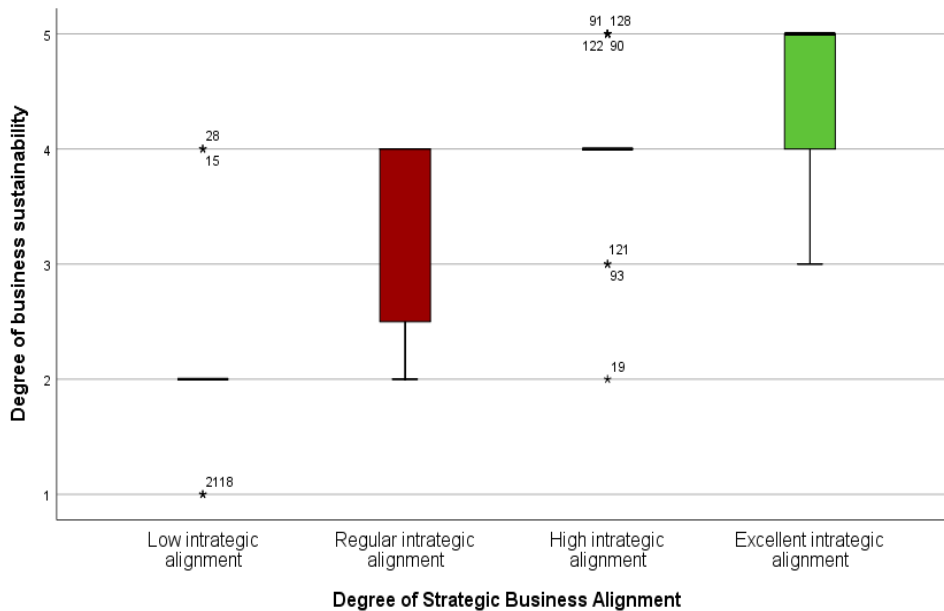
Figure 3. Relationship between the degree of intrategy alignment and business sustainability in SMEs

Figure 3 shows the box and whiskers diagram of the 247 values grouped together, which illustrate the relationship between the degree of intrinsic alignment and business sustainability in SMEs. The significant findings of the variable degree of intrategy alignment with a mean of 4.46, a median and fashion of 5.00, with a standard deviation of 0.800, a variance of 0.640 with values distributed in a minimum of 2 and a maximum of 5. On the other hand, the variable business sustainability with a mean of 4.23, a median and fashion of 4.00, with a standard deviation of 0.801, a variance of 0.642 with values distributed in a minimum of 1 and a maximum of 5.

Both variables with a strong ratio of 0.691 according to the contingency coefficient, with a concentration of the data the excellent degree of intrinsic alignment that provides values above 4 (High and Excellent) business sustainability. Likewise, the data has a close grouping in the regular degree of intrategy alignment with values

between (2-4) concentrated in the regular and high business sustainability categories. Finally, the existence of 11 outliers detailed below: Low degree of intrategy alignment (21, 18, 28 and 15), High degree of strategic alignment (19, 93, 121, 91, 128, 90, 122). So that managers and/or directors enhance their positions based on the contribution of economic generation (44.50%), social contribution (30.30%) and environmental protection (25.20%) as the components that guarantee long-term business success.

The above results reflect a strong relationship between the degree of intrategy alignment and business sustainability in the SMEs in the region of Tacna, Peru. In other words, SMEs dedicated to manufacturing make efforts to align organizational structure and organizational behaviour in every execution of corporate strategies. This leads to organizational harmony that creates synergies in work teams that are motivated to achieve business objectives. These results are consistent with the approaches of Ghobakhloo and Fathi (2020); Puspitaningtyas (2020) and Fuentes et al. (2019) who consider some strategies to maintain harmony among the members of the organization, modern management, good financial practice in the development of operations, taking advantage of technological resources (IT) to develop digitally adjusted manufacturing systems to confer sustained competitiveness in the era of Industry 4.0 in its absence survival in the era COVID-19 and Post-COVID-19.

4. Conclusions

On the basis of the results presented, it is determined that there is a strong positive relationship between the degree of intra-strategic alignment and business sustainability in the SMEs dedicated to the manufacturing sector in the region of Tacna, Peru. Modernity has brought with it a technological transition (Industry 4.0), new diseases (COVID-19) and other political, economic and social processes that distinguish the Latin American reality, where SMEs dedicated to manufacturing are trying to overcome the challenges of the 21st century by resorting to intra-regional alignment with strategy as a source of business sustainability. Specifically, there is a vision of an intra-strategic route characterized by a rapid response to the managerial decisions of the productive entity. This will allow the dynamization of the productive cycle without neglecting the pre-established strategic plans.
Business sustainability will be given in terms of harmonizing the internal structural aspects of the SME and the route mapped out for achieving the objectives. This involves applying strategies for profitability (economic), human capital training (human), technological infrastructure (ICT), social responsibility (social) and environmental protection (environmental).

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Romel Ramón GONZÁLEZ-DÍAZ is the Professor of Business Enterprise and Innovation and Director of the CIID, Montería Colombia.
ORCID ID: https://orcid.org/0000-0002-7529-8847

Santos Lucio GUANILO GÓMEZ
ORCID ID: https://orcid.org/0000-0002-7611-937x

Jorge SUÁREZ CAMPOS
ORCID ID: https://orcid.org/0000-0002-7080-1423

Ángel Eduardo ACEVEDO-DUQUE
ORCID ID: https://orcid.org/0000-0002-8774-3282

Elena CACHICATARI VARGAS
ORCID ID: https://orcid.org/0000-0000-9843-432

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CORE FEATURES FOR THE DESIGN OF REMUNERATION SYSTEMS FOR SUSTAINABLE HUMAN RESOURCE MANAGEMENT DURING THE COVID-19 PANDEMIC: POLISH COMPANIES EXPERIENCES [*]

Hanna Kinowska

Collegium of Business Administration, SGH Warsaw School of Economics, al. Niepodległości 162, 02-554 Warsaw, Poland

E-mail: hanna.kinowska@sgh.waw.pl

Abstract. Fulfilling the objectives of sustainable development aimed at combining economic, social and ecological objectives is supported by the concept of Sustainable Human Resource Management (SHRM). SHRM practices enable the maintenance, renewal and restoration of human resources. The article fills a research gap on the characteristics of remuneration systems in SHRM. The purpose of this study is to reveal the remuneration practices that allow organisations to implement sustainable human resource management's characteristics in the COVID-19 crisis. The research uses qualitative data from Polish organisations collected through semi-structured interviews with 15 managers responsible for human resource management (HRM). It shows a diversity of remuneration practices during the COVID-19 crisis such as focusing the remuneration systems on the long-term goals of the organisation and combining social goals with business pragmatism.

Keywords: sustainable HRM; remuneration system; COVID-19

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1. Introduction

Implementing sustainable development concepts – including functioning in the long term and taking into account economic, social and environmental objectives – requires coherent organisational management. Human Resources (HR) play a key role here. The concept of Sustainable human resource management (SHRM) is present in the literature (Diaz-Carrion, López-Fernández, & Romero-Fernandez, 2018; Ehnert & Harry, 2012). Pioneering research is emerging to reveal the characteristics of SHRM functions (Stankevičiute & Savanevičiene, 2018). One of the researchers' views is that the development of personal functions does not keep pace with changes in the work environment (Juchnowicz, 2019). Therefore, the solutions applied are not consistent with organisational aspirations within sustainable development.

Due to their impact on employee behaviour, remuneration systems play a key role in shaping the basis for work that supports sustainable development objectives. Its effectiveness is affected by the employer's consistent application of rules and practices adequate to the adopted strategy. The coherence and consistency of the solutions applied are verified in crises. For instance, as a result of the crisis caused by the COVID-19 pandemic, changes in the functioning of businesses pose challenges to maintaining SHRM rules. Only organisations that have an established track record of sustainable development can maintain consistency even in difficult circumstances resulting from the volatility of the environment. By applying consistent rules, they attract and engage valuable employees and encourage their development and efficiency gains. Lack of knowledge of SHRM's supporting principles can lead to the disruption of an organisation, hence the need for up-to-date research on the characteristics of remuneration systems in sustainable human resource management.

The research gap in the literature boils down to the lack of analysis of the characteristics of remuneration systems supporting SHRM. Only pioneering observations are present (Radvila & Šilingienė, 2020), though the need for remuneration analyses in the SHRM is an area that requires further analysis (Ehnert & Harry, 2012; Westerman, Rao, Vanka, & Gupta, 2020).

The purpose of this paper is to analyse the characteristics of remuneration systems supporting sustainable management using the COVID-19 crisis as a case study. The analysis was carried out based on a critical literature review and exploratory qualitative research. The article broadens the knowledge of SHRM's remuneration systems and supports the popularisation of this model in the practices of organisations.

2. Theoretical background

Remuneration systems in sustainable human capital management
The literature on the relationship between remuneration systems and sustainable HRM is theoretically and empirically inadequate (Radvila & Šilingienė, 2020). In the SHRM analysis, remuneration issues are addressed in a piecemeal fashion and limited to the integration of environmental initiatives into pay systems. Given the impact of remuneration schemes on workers' behaviour, its link to the sustainable development strategy requires an approach that accounts for all three dimensions: economic, social and environmental.

The economic dimension of SHRM implements system solutions that allow for achieving high work efficiency at the individual, team and organisational level (Poškiene, 2014). Despite numerous publications, this remains a highly-reviewed discourse for researchers (Guest, 2011). The above trend includes analyses of remuneration schemes in relation to the elements that make up their structure. Some concepts are comprehensive (Armstrong & Taylor, 2017; Milkovich, Newman, & Gerhart, 2014; Radvila & Šilingienė, 2020; Wang, Zhao, & Thornhill, 2015). There is a consensus on the need for strategic action in the development of remuneration policy (Lawler, 1990), on drawing comparisons between remuneration to company culture, values and objectives (Flannery, Hofrichter, & Platten, 1996) and work effects and behaviours of employees in line with the organisation's objectives (Schuster & Zingheim, 1992) taking into account the principles of fairness by considering employee's contribution to the organisation (Juchnowicz, 2012).

Remuneration is an important factor in the concept of socially responsible HRM found in the literature, due to growing appreciation of the social dimension of SHRM. It involves creating a working environment in which employees achieve their professional goals while implementing the company's strategy. It is comprised of fair remuneration adequate to the employee's work engagement and comprehensive benefits (Pocztowski, 2016). Ensuring fairness in remuneration systems is the foundation of their functioning under SHRM conditions (Kinowska, 2020). The research shows that fairness and transparent remuneration rules are popular actions undertaken in SHRM in Polish companies.

Combined with Green Human Resource Management (GHRM), the environmental dimension of SHRM aims to develop the ecological sensitivity of employees, ensuring awareness on how to protect the environment through their actions. Remuneration systems that support pro-ecological behaviour of employees include components rewarding for expected effects and attitudes; for example, awarding bonuses and prizes for the economical use of materials and machines, and sustainable development innovations implemented in the organisation (Pabian, 2017). Research shows that linking remuneration to the achievement of environmental objectives increases the effort to achieve them (May & Flannery, 1995; Milliman & Clair, 2013; Ramus, 2002). The effectiveness of this practice is confirmed by observations in highly polluting industries (Berrone & Gomez-Mejia, 2009).

Subsequently, the development of appropriate remuneration systems is a challenge due to the difficulty of accurately assessing environmental behaviour and performance (Fernández, Junquera, & Ordiz, 2003). Environmental competence can be a criterion for differentiating basic salaries (Brockett, 2007). Popular instruments to support environmental initiatives are discretionary awards – trips and diplomas, paid holidays, leisure time, parking spaces and gift vouchers (Govindarajulu & Daily, 2004). Examples in the literature confirm that such practices motivate workers to develop environmental initiatives (Ramus, 2002). Errors in the design of remuneration systems can cause employees to avoid reporting environmental problems (Del Brío, Fernández, & Junquera, 2007). Based on analyses of SHRM supporting practices, other authors have postulated research that identifies an effective approach to the design and implementation of remuneration systems that enable the achievement of environmental objectives (Jackson, Renwick, Jabbour, & Muller-Camen, 2011). The following characteristics were distinguished in the pioneering analyses of remuneration systems within the SHRM: orientation and objectives, formalisation, performance orientation and flexibility (Radvila & Šilingienė, 2020). Remuneration systems were analysed within the SHRM model, including the following characteristics: a long-term perspective, care for employees and the environment, profitability, employee participation or empowerment (employee involvement in decision-making processes), employee development, external partnership, flexibility, higher standards than required by labour law, cooperation and fairness and equality (Stankevičiute & Savanevičiene, 2018). The complexity of the available models requires maturity of implementation of SHRM assumptions not available to organisations operating in Poland.

Due to the limited presence of SHRM in Polish companies (Piwowar-Sulej, 2021), the article uses a conceptual framework combining the postulated features of remuneration systems with the general principles in the SHRM concept. The following remuneration characteristics supporting sustainable HRM are noted (Ehnert, Parsa, Roper, Wagner, & Muller-Camen, 2016):

1) Taking into account the complexity of the relationship between the HRM system and the external and internal organisational environment manifested by linking the remuneration system to the business strategy and HRM in a way that enables their implementation;

2) Activities enabling the long-term reproduction of resources by supporting the long-term objectives of the organisation and addressing current challenges through reward systems;

3) Recognising and reconciling potentially conflicting economic, environmental and social objectives in remuneration systems.

Impact of COVID-19 on the labour market in Poland

The exploration of the use of sustainable development principles in enterprises operating in Poland under the conditions of the COVID-19 crisis requires understanding Poland's labour market. The Polish economy has the potential typical of this part of Europe. Polish GDP per capita in 2018 amounted to 12,400 EUR. It represented about 45% of the average GDP per capita for EU countries (Eurostat, 2019).

The analysis of social development is based on two main characteristics: the average salary and the wage gap between the highest and lowest earners. In Poland, the average salary is among the lowest in the EU (Reinis Fischer, 2019) although it is constantly growing. Its dynamics decreased due to the economic slowdown associated with the 2008 crisis (European Trade Union Institute, 2016). The low average salary reveals only a part of the problems Poland is facing. Another is a significant disproportion between the highest and the lowest earners. In Europe, there are significant inequalities in income distribution – the 20% of the population with the highest income in 2017 receives 5.1 times more income than the 20% of the population with the lowest income. In Poland, this indicator equals 4.1, which is slightly below the European average (Eurostat, 2019).

The effects of the COVID-19 pandemic were quickly reflected in the Polish labour market. The rate of registered unemployment in Poland in April 2020 was 5.7% and increased by 0.3 p.p. compared to the previous month. In April 2020, a month after the beginning of the crisis, there were 964,800 unemployed registered in labour offices (55,400 more than a month earlier). The average monthly salary (gross) in the enterprise sector decreased by 3.7 p.p. compared to the previous month, and in April 2020, it amounted to 5,285.01 PLN. In April 2020, 57,500 vacancies were submitted to labour offices: 20,200 (26%) less than in March 2020 (PARP, 2020).

3. Research objective and methodology

This study aims to reveal the characteristics of remuneration systems in Polish companies applying the SHRM framework, and to confirm the theoretical links between SHRM and remuneration systems by empirically assessing the expression of its principles in the characteristics of remuneration systems.

The methods of achieving this goal included a critical review of the source literature and diagnostic research. The study is based on qualitative data collected in 15 Polish organisations that declare sustainable development activities. The respondents were people responsible for shaping HRM functions in the organisation.

To achieve the research objectives, the following research questions were asked:
-   What are the main features of remuneration systems in sustainable human resource management?
-   How did these features manifest themselves in the COVID-19 crisis in Polish companies employing sustainable development principles?

The main research hypothesis adopted is that the characteristics of COVID-19 remuneration systems in sustainable organisations are in line with SHRM principles.

In the first stage of the analysis, a systematic review of the literature was carried out. It takes into account research work on sustainable SHRM and related practices for remuneration schemes. Based on the literature review, the features of remuneration systems supporting the concept of sustainable HRM were formulated.

The second stage of the study presents the results of empirical observations. The complexity of the topic, the lack of existing data and the exploratory nature of the analysis required a qualitative approach. The research was carried out from June to August 2020, that is, in the period where business restrictions introduced in March 2020 due to the COVID-19 pandemic were gradually loosened in Poland. Organisations that publicly (in their annual reports or on their websites) declared sustainable development activities were invited to participate in the query. In total, 15 organisations agreed to participate in the research. Due to the execution of queries in times of COVID-19 restrictions, all interviews were conducted using remote communication tools. The organisations analysed represented various industries in the private sector: manufacturing, trade, consulting and services. Board members supervising human resources functions and human resource managers were selected to provide comprehensive and accurate data as the analyses focused on the activities through which sustainable human resource management is implemented. Table 1 shows the profile of the organisation and the roles of the interviewing managers.

Table 1. Profile of organisations and respondents.

Respondent number	Type of activity	Number of employees	Gender	Role in the organisation
R1	Consulting	Approx. 6,000 (Poland)	woman	HR expert
R2	High technology	Approx. 1,000 (Poland)	woman	HR Manager
R3	Finances	Approx. 4,000 (Poland)	woman	HR Director
R4	Production	Approx. 43,000 (world)	woman	HR Manager
R5	Consulting	Approx. 8, 900 (world)	man	Talent & Development Manager
R6	Production	Approx. 3,000 (Poland)	man	HR Operations Manager
R7	Hotel business	Approx. 10 (Poland)	man	The owner
R8	Consulting	Approx. 1,000 (Poland)	woman	Project Manager
R9	Production	Approx. 200 (Poland)	woman	HR Manager
R10	Production	Approx. 700 (Poland)	woman	HR Business Partner
R11	Finances	Approx. 250 (Poland)	woman	HR Manager
R12	Trade	Approx. 1,800 (Poland)	woman	HR Manager
R13	Consulting	Approx. 2,000 (Poland)	woman	HR Manager
R14	Pharmacy	Approx. 2,500 (Poland)	woman	HR Manager
R15	High technology	Approx. 1,000 (Poland)	woman	HR Manager

Source: the author.

In total, 15 semi-structured interviews were conducted. The interviews were conducted in Polish, recorded digitally and then transcribed. The guidelines for conducting interviews consisted of five groups of questions

concerning selected practices of SHRM. For this article, the questions from the group on pay systems have been analysed, including a diagnosis of the remuneration system and the criteria for hiring employees concerned have changed following the COVID-19 pandemic crisis. The basic questions were supplemented with additional ones to improve the respondents' understanding of individual issues. The average duration of the interview was about one hour. To carry out the analysis, a theoretical code system based on the characteristics of SHRM was developed. The following procedure has been implemented: (1) preliminary examination of all interview transcripts for an overall assessment of their content; (2) multiple analyses of the transcripts and extraction of relevant statements; (3) condensation of extracted statements; (4) identification of practices based on the condensed statements; (5) extraction of groups of practices. The article presents results focusing on practices and their groups through which sustainable human resource management is expressed in the COVID-19 crisis remuneration systems.

4. Results and discussion

The aim of the qualitative component of this study is to explore the characteristics of remuneration systems supporting SHRM in Polish organisations in the COVID-19 crisis. Based on the analysis of the literature, four features of the remuneration system in SHRM were distinguished: (1) business pragmatism, (2) long-term orientation, taking into account (3) social and (4) environmental objectives. From the analysis of the interviews conducted within each of the characteristics, remuneration practices supporting the functioning of the analysed organisations during COVID-19 were identified. A grouping of similar practices was then carried out. The organisations under analysis declared the varied impact of the COVID-19 crisis on their operating possibilities and the generation of revenues and profits. The variability included: the need for a halt of operations and temporary lack of revenues (R7), changes in the production profile (R6), an increase in demand for selected services and a decrease in demand for others (R8) and the lack of impact of the crisis on the organisation (R13).
Research shows that the analysed companies were aware of the advantages of applying SHRM principles in times of crisis: "it was our company, thanks to this sustainable development, that was able to resist, to withstand the pressure of the difficulties of COVID" (R4). The first of the distinguished groups of remuneration practices were activities that testify to the business pragmatism of the examined organisations during COVID-19 (Table 2). Three types were distinguished: a systemic approach, communicating the package's value and monitoring attractiveness to employees.

Table 2. Remuneration practices related to business pragmatism

Feature	Group of practices	Practices during COVID-19
Business pragmatism	Systemic approach	– the use of the salary grid; – basic salaries based on market levels; – remuneration above market rates paid in the form of an allowance for unique competences (possibility of withdrawal during the crisis); – variable parts depending on the performance of business lines and the effects of individual employees; – allowing flexible adjustment of pay levels depending on the impact of the crisis;
	Communicating the value of the remuneration package	– the use of an online portal where the employee can check the total value of the remuneration received including cash and non-cash parts;
	Monitoring attractiveness for employees	– modifications to the benefits package to choose from within the cafeteria provided to employees.

Source: the author.

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The diagnosed organisations applied the structured principles of basic remuneration within the company's general salary grid:

"From a business perspective, it's a grid, there's an organisation, it's got its own chart of grades" (R9).

"For some time now, we've been moving within certain financial brackets for the given job" (R10).

The remuneration was determined based on target market remuneration levels:

"We've tried to make these salaries in our company equal to the market median in order to be competitive, or at least not to stand out from the market" (R10).

"We try to follow how the market pays, to be financially attractive to our candidates, to our employees" (R12).

"The assumption we made was that we wouldn't go below the market minimum wage, then finally it stood on average" (R15).

Possible deviations from market wage levels – resulting from the need to take into account the value of competences unique at a given moment in the labour market – were introduced in the form of wage supplements:

"Special qualification allowance; that is, you have a specific certification which causes your value in the market to be increased, because normally implementation consultants would earn X, and because you have this specific certification, you are able to find a job in the market with higher money. Sometimes even 2x higher" (R2).

Such a solution allowed flexibility in regulating the remuneration during a pandemic. The formula of the bonus suggested to staff the reduced stability of this ingredient. It provided an opportunity to withdraw it during the crisis without reducing the basic salary. After the withdrawal of the allowance, the remuneration remained at the market level.

A common solution in the observed organisations was to use variable remuneration depending on individual, team and company performance. Thanks to this, depending on its impact on the organisation's results, automatically adjusting the level of the variable part became possible:

"How our bonus works, we'll know next March. Because then the effect of Covid and the whole year will have a direct impact on whether and who gets any bonus" (R2).

"We've got a year's target and there's a bonus over target. So, if you reach your goal, you still have to earn that bonus by generating a surplus" (R15).

Struggling with revenue drop, the organisations under analysis first introduced modifications to the bonus: "We have significantly reduced the number of people entitled to bonuses" (R3).

Focusing on changes in the variable part of pay made adapting the existing solutions to the different specificities of the work of individual teams during the COVID-19 crisis possible. It allowed organizations withdraw the bonus for supporting jobs and leave it for jobs that were dependent on individual performance and for which the bonus constituted a significant part of total remuneration: "New business bonus, supporting sales – stayed. It's not a bonus; it's a commission" (R15).

The organisations under study actively shaped employees' awareness of the total value of remuneration received including the fixed part, variable part and benefits:

"That if, for example, when it comes to wages, we're trying to show that you have such wages, but see, there's so many benefits that would cost you money if you wanted to purchase them. Often, employees forget that these benefits are 90% paid by the company. The company bears the costs" (R14).

"In general, we want to show the employee all the benefits he has from working for us by converting the benefits into market values" (R15).

In organisations where, due to the crisis, the structure of tasks performed by the HR unit changed and space for new initiatives appeared, additional time was spent on learning about the appeal of benefits for employees. Modifications were made based on the opinions of the employees:

"A certain amount of breaks in some of the business areas that we had made people come back to us with feedback; how this system of non-wage benefits is perceived by them. And the very transformation that we're also doing in the HR field has given us space to change this system" (R5).

From the research results, it can be concluded that the analysed organisations applied a systematic approach to remuneration. They formalised remuneration systems. The wage grid was based on market levels. They benefited from extensive variable remuneration and benefit systems, calculated and communicated to the employees the value of the total remuneration package, monitored the attractiveness of benefits and modified them depending on employee feedback.

Sustainable HRM requires a long-term perspective. The research conducted revealed three groups of practices which prove its application in remuneration systems: protection of workplaces, the temporariness of changes and fulfilment of promises (Table 3).

Table 3. Remuneration practices that relate to the long-term perspective

Feature	Group of practices:	Practices during COVID-19
Long-term perspective	Protection of workplaces	– the use of unpaid leave by top earners; – avoiding layoffs by temporarily transferring employees to other tasks; – sending employees on overdue leave; – temporary reduction of working hours;
	Temporariness of changes	– the rehiring of redundant workers under the same conditions; – a quick return to the pre-reduction salary;
	Fulfilment of promises	– to carry out the basic salary increases promised to employees before the pandemic;

Source: own study.

The employers under analysis were aware of the two-sided benefits of long-term relationships with employees:
"An indefinite contract is such a guarantee for employees with whom we are bound for more than a year. Because it also gives them some guarantee that we're not about to part with them when the contract ends, they can look to the future safely" (R7).

In cases of financial problems resulting from the COVID-19 crisis, some employees were encouraged to reduce their working hours to avoid or postpone the need to terminate contracts:
"Part of this restructuring is to tell people: come forward to reduce your working hours by 20% until the end of the year" (R2).

To avoid redundancies, employers sent employees on overdue leave and shifted them to tasks that were increasing in number due to the effects of the pandemic:
"Initially, in the first phase of the pandemic, we used to send employees on leave. If the form of the leave was exhausted, unfortunately, we had to part with some" (R7);
"Teams appeared (...) where, due to the nature of our industry, there was 300% more work than usual. And we needed hands to work. And that was the moment: 'Okay, here it is, because there are no new contracts, we're moving you to the collection department'" (R11).

Where there was a need to carry out salary reductions, the organisations concerned made effort to return to the status quo as soon as possible:

"There have been some measures taken in our company to reduce the salary, but temporary, in those business areas that have indeed been most affected by the pandemic and pandemic-related crisis. Now we're in July, I mean we're in August, but since the beginning of July, we've basically returned to the pre-crisis situation" (R4).
"At the end of June, we return to standard rules and tasks. And the way of accounting" (R6).

An important value for the companies analysed was the fulfilment of the promises made regarding remuneration. The pay raises promised to employees at the beginning of the year were implemented despite the deterioration of the company's financial situation:
"We implemented pay raises in April. That too, we even wondered if we would have permission for employee raises. In our case it is funny because we are making raises retrospectively from the first of January, although sometimes decisions are made in March, and as in our case, it was in April, when the crisis was bustling around the world. But we implemented the pay raises; employees received the pay raises. They were very pleased with it" (R4).

In conclusion, the examined organisations took into account the long-term effects when establishing remuneration decisions in a crisis. Because they were aware of the impact of long-term relationships with employees and the fulfilment of their pay promises, they protected jobs and quickly restored pre-crisis conditions. Social orientation, which is important for SHRM, was included in the remuneration systems when wages were reduced, and these organisations granted their employees compensation for working in close contact with other people during the pandemic (Table 4).

Table 4. Remuneration practices taking into account social orientation

Feature	Group of practices	Practices during COVID-19
Social orientation	Taking into account remuneration levels in remuneration reductions	– voluntary participation in reductions by encouraging to the use of unpaid leave only by top earners; – in the case of changes in variable salaries (bonuses, allowances), maintaining them for the lowest earners;
	Additional remuneration for work in the company at the time of closure of the economy	– a bonus for working in a factory during a pandemic; – allowances for coming to work during a pandemic; – equalisation of sickness benefit to 100%; – guarantee of paying a bonus for 3 months from the beginning of the crisis regardless of the results; – reduction in the working hours of production workers while maintaining full-time wages.

Source: the author.

The queried organisations took into account the level of remuneration received. Wage reductions were limited to the highest earners, who were encouraged to take unpaid leaves:
"All better-paid employees of our company have been asked to volunteer to take a week of unpaid leave" (R2).
Efforts were made to ensure that the withdrawal of salary supplements, reductions in the fixed part and bonuses were less severe for the lesser earners:
"Those who earn less will be included. This allowance will be included in the basic salary, but the extra policy is out, and those who earn better will simply lose" (R2).

"Unfortunately, we had a 20% reduction under the shield along with a reduction in working hours. Of course, we made the assumption that we do not go below the minimum market wage, then we finally decided it will be average wage, so there are groups here that had a 10% reduction, not 20%" (R15).

Organisations that required their employees to be present at the workplace at the time of the closure of the economy offered them extra pay. Solutions included the reduction of working hours while retaining wages, pay and bonus allowances, and compensation for sickness benefit or care allowance related to COVID:
"As early as in March, we offered our employees three very important things: a work allowance, a guarantee of employment for three months, equalisation of bonuses and allowances for people who had to go for care allowance because they had children or were sick and it was COVID-related. It was the XYZ that was supplementing the 100% salary" (R6).
"A COVID bonus for workers in production who do not work eight hours, only six hours, being paid in full so that they do not feel discriminated against office workers" (R9).

To sum up the inclusion of a social orientation in wages, the use of social criteria in the changes resulting from the COVID-19 crisis should be noted. These criteria took into account both companies whose operating conditions deteriorated and those that could continue to operate. The organisations surveyed reduced basic salaries so that the changes affected the lowest earners the least. When it was necessary to work in contact with colleagues during the pandemic, companies compensated their employees for the inconvenience.

An important aspect of sustainable development was the inclusion of environmental orientation in remuneration systems. The research shows that during the COVID-19 pandemic, companies paid relatively little attention to environmental orientation. It manifested only when employers financed charity organisations from the remuneration received or exchanged the pool of funds earmarked for benefits to support the charity (Table 5):

Table 5. Remuneration practices taking into account environmental orientation

Feature	Group of practices	Practices during COVID-19
Eco-orientation	Supporting the financing of charitable organisations	– the possibility of paying contributions from wages to the chosen charity and doubling this amount by the employer;

Source: the author.

Employers introduced changes to benefit systems, allowing funds to be used for charitable purposes instead of the purchase of goods and services for employees:
"People, for example, have told us that they lack the ability to donate some of the points that go from their employer to charity – for a charity of their choice. So, we decided to change the benefit provider and the system itself from next year on, so that our employees can do that" (R5).

An alternative solution was for the company to mediate in the regular financing of charitable activities by deducting, at the request of the employee, the amount from the salary and subsidising the supported organisation by the employer:
"Any employee may sign such a declaration and agree to the deduction of an amount from his or her monthly salary for the benefit of this programme (...). And that money is accumulated in the account. When a need arises, whether in Poland, the Czech Republic, Serbia or some other continent, then this organisation, which manages the funds, takes a certain amount of money from the available ones, informs everyone what the money is spent on, and XYZ adds twice as much" (R4).

The results showed that the environmental aspect of the COVID-19 crisis was relatively the least significant of the dimensions analysed. It was limited to relatively small gestures supporting employees' initiative.

5. Discussion of the results

Most of the publications available in the literature on SHRM remuneration schemes are descriptive. They lack empirical research. Qualitative research that allows for the identification of key aspects of the structures under analysis is rare. The analyses of the relationship between changes in remuneration systems resulting from the COVID-19 crisis and sustainable HRM is pioneering. They confirm the effectiveness of the application of sustainability principles in remuneration systems and provide insight into the sustainability of the management concepts adopted.

The results confirm the validity of Radvila and Šilingienė's (2020) statements during the COVID-19 crisis. According to their observations, the dimensions of SHRM are reflected in objectives, performance orientation and flexibility of remuneration schemes. The indicated characteristics are present in solutions implemented during the pandemic in all observed dimensions: business pragmatism, long-term orientation and combining economic, social and environmental aspects.

Empirical observations carried out confirmed the model of characteristic features of SHRM practises during the COVID-19 crisis (Stankevičiute & Savanevičiene, 2018). They include care for employees, profitability, external partnership, fairness and equality and development of employees. The remuneration systems in the COVID-19 era show that the focus of the analysed organisations was on caring for employees through the application of solutions aimed at protecting workplaces, compensating for the pandemic and minimising the nuisance of salary reductions. Fairness and equality were manifested in the consistent application of the adopted solutions to groups of employees, taking into account the level of remuneration when taking adverse measures for employees, employee opinions on their benefits and introducing solutions to support social initiatives.
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n the Stankevičiūtė and Savanevičienė studies (2018), a long-term orientation was among the characteristics moderately present in SHRM. Analyses of the remuneration systems during the COVID-19 indicate that this dimension is significant in a crisis.

The results of the research support the claim that sustainability at the level of HRM systems is a complex, multi-faceted design (Ehnert & Harry, 2012). It covers environmental, social and economic aspects. The analyses also confirmed the presence of all three dimensions of sustainability in the remuneration systems during the COVID-19 crisis. The ideas of sustainable economic, social and environmental development are implemented through separate characteristics of the remuneration system. Empirical observations have revealed how the commitment to the principles of sustainability has shaped the responses of companies to the COVID-19 crisis remuneration systems.

Conclusions

The article provides empirical insights into the remuneration system in SHRM during the COVID-19 crisis. The value of the article is based on empirically proven characteristics of the remuneration system, drawing relations to SHRM attributes. The added value of empirical research includes disclosure of the components of remuneration systems that contribute to SHRM in the COVID-19 crisis.

The novelty of the reserach is the identification of specific characteristics and practices of remuneration systems in all analysed dimentions of sustainable management:

1) Taking into account the complexity of relations between the HRM system and the external and internal organisational environment in connection with the remuneration system with the business strategy and HRM. The research shows that on implementation, this manifests as the focus on a systemic approach to remuneration, communicating the value of the remuneration package and monitoring its value for employees;

2) Activities enabling the long-term reproduction of resources by supporting both the long-term objectives of the organisation through remuneration systems and addressing current challenges. The study points to the particular importance of protecting jobs, the temporariness of changes (in particular deterioration due to the crisis) and keeping wage promises;

3) Recognising and reconciling potentially conflicting objectives in remuneration systems: economic, environmental and social. Reserch shows that this dimention has manifested itself in taking account of the social perspective in wage reductions and compensating for the need to work at a time when the economy is closed, including the possibility of supporting charities in the remuneration systems.

The conducted analyses fill the research gap in the the design of remuneration systems supporting SHRM. The research has shown the existence of a set of specific characteristics of remuneration systems typical of SHRM. Their importance is particularly evident during the COVID-19 crisis. The increased popularity of SHRM concept should contribute to further research into supporting practices in particular remuneration schemes. Further quantitative analyses are needed to confirm the links between solutions and sustainable management features, as well as the identification of good practices to promote the implementation of the SHRM model in organisations.

Research limitations

Although this research makes important theoretical and empirical contributions to the existing literature, some limitations must be kept in mind. The main empirical contribution of this article is drawing attention to characteristics of remuneration systems supporting SHRM. The COVID-19 crisis was used as a case study. The in-depth interviews were conducted during the first wave of the pandemic. The crisis has consequences on many levels — in the economy, the labour market, the education, the ability of organisations to carry out their activities and employees to work. The sudden and acute nature of the crisis highlighted the characteristics of organisational solutions. It was a verification of their commitment to the declared principles of sustainable development. The difficult and unexpected market situation highlighted the characteristics of remuneration systems. Their specificity is, on the one hand, linked to the reaction to the crisis and, on the other hand, contains features which may be also universal in post-crisis times.

The respondents in the in-depth interviews were limited to employers from Poland. They represented a diverse range of organisations pledging to act in accordance with the principles of sustainable development. The identified characteristics of remuneration systems were present in both local and international organisations participating in the study. Therefore, it can be concluded that the described research results may also be of importance in the international discourse. Some limitation may be the intentional selection of the research sample, which preclude the generalization of the obtained results.

Certainly, this issue requires further research, especially with regard to the universal characteristics and design of remuneration systems in SHRM. Quantitative research should be considered as the next research step that allows to deepen the obtained results. The quantitative analysis could help to reliably estimate how the characteristics and components of remuneration systems affect the sustainable management in the organisations.

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Acknowledgements

Hanna KINOWSKA is Assistant Professor at the Institute of Human Capital at SGH Warsaw School of Economics. Sheholds a PhD in economics. She islecturer, author of many publications on human capital management. Associated with practice, she has carried out numerous projects improving human capital management, especially in the areas of remuneration systems and employee engagement.
ORCID ID: orcid.org/0000-0002-7936-9737

Register for an ORCID ID:
https://orcid.org/register

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THE GENDER-BASED ATTAINMENT OF EDUCATION AND FEMALE ENTREPRENEURSHIP: THE EUROPEAN PERSPECTIVE

Aleksandra Gawel

Poznan University of Economics and Business, Al. Niepodleglosci 10, 61-875 Poznan, Poland

E-mail: aleksandra.gawel@ue.poznan.pl

Abstract. Although in European countries women obtain higher education more often than men, they still comprise about 30% of entrepreneurs. To understand the gender gap in entrepreneurship, the study aims to assess the impact of education on female entrepreneurship in two aspects, as explained by both male and female education levels and by different levels of education (primary, secondary, tertiary). To verify hypotheses, the empirical models are estimated with female entrepreneurship as the dependent variable and with the level of education as the independent one with the panel regression method for panel data for 31 European countries yearly 2000-2019. Results confirm that both male and female education levels impact female entrepreneurship. Female entrepreneurship is positively related to the share of females with higher and partial secondary education, as well as the share of males with primary education. Female entrepreneurship is reduced by the share of females with primary education and the share of males with higher education. There are two aspects of novelty in the paper. Firstly, female entrepreneurship is explained by both male and female education levels as both genders create the social environment for entrepreneurship; female education has a direct impact through the skills and competences, while male education impacts indirectly by influencing the business environment. The second aspect is the assumption that female entrepreneurship is explained by different levels of education (primary, secondary and tertiary), which impact their decisions to enter entrepreneurship.

Keywords: female entrepreneurship; female education levels; male education levels; European countries

1. Introduction

In Europe, males are twice as likely as females to enter entrepreneurship (Dilli, Westerhuis 2018; Ester, Román 2017), despite increasing female participation in the workforce (Alsos et al. 2016). Women not only run their own businesses less often, but they also differ in terms of goals, size, profitability and growth intentions when compared to male entrepreneurs (Giotopoulos et al. 2017). The explanation of the gender gap in entrepreneurship is mostly done within institutional theory (i.e. Estrin, Mickiewicz 2011; Chowdhury, Audretsch 2014),

psychological or personal treats (i.e. Lawter et al. 2016), generation explanations (Este, Román 2017) or human capital theories.

Education level is often seen as a factor supporting entrepreneurship (Westhead, Solesvik 2016). However, in the context of female entrepreneurship, on the one hand, some research shows that women's education is not the most important factor in becoming an entrepreneur and many entrepreneurs do not have a formal educational background for their businesses (Loh, Dahesihsari 2013; Anambane, Adom 2018). On the other hand, the lack of formal education is believed to be one of the factors explaining the gender gap in entrepreneurship (Vukmirović 2019; Chowdhury, Audretsch 2014; Ribes-Giner et al. 2019).

Although education is a multidimensional factor, in research on female entrepreneurship, it is seen mostly through the perspective of women's higher education. However, in the paper, it is assumed that female entrepreneurship can explained by both male and female education levels. The attitude of both genders creates the social environment for entrepreneurship; female education can have a direct impact on their entrepreneurship, thanks to skills and competences gained by formal education and work experience, while male education can have an indirect impact by shaping social norms and expectations, as well as standards for running a business. Moreover, it is assumed that female entrepreneurship is explained by different levels of education (primary, secondary and tertiary) – the knowledge and skills needed to run a business can be gained thanks to both formal education and work experience. Females with primary and secondary education could miss some competences from higher education; however, they gain other competences through their work experience.

The paper is organized as follows. The first part presents the theoretical background with a discussion of the gender gap in entrepreneurship, the role of education in shaping the decision to enter into entrepreneurship and the existing knowledge on the impact of education on female entrepreneurship. Based on this, the second part of the paper is methods and materials, including the development of the hypotheses and research method employed in the paper. Then, the results and discussion, as well as final conclusions, are presented.

2. THEORETICAL BACKGROUND
2.1. The gender gap in entrepreneurship

Gender equality has been raised in modern societies, thanks to increasing female participation in the workforce (Alsos et al. 2016); however, a gender gap in entrepreneurship is still observed. In Europe, males are twice as likely as females to enter into entrepreneurship (Ester, Román 2017). Women not only enter into entrepreneurship less often, but they also differ in terms of goals, size, profitability and growth intentions when compared to male entrepreneurs (Giotopoulos et al. 2017).

Various frameworks are used in the literature to explain the gender gap in entrepreneurship, mostly institutional theory with cultural and social explanations (Estrin, Mickiewicz 2011; Chowdhury, Audretsch 2014); psychological points of view, such as independency or flexibility as personal treats (Lawter et al. 2016); generation explanations (Ester, Román 2017); or human capital theories. Part of the research focuses on factors influencing female entrepreneurship which actually impact entrepreneurs regardless of gender, and tries to recognize the differences in female and male reactions to them. Such examples can be found among both necessity-driven factors, where female are motivated to enter into entrepreneurship by an unfavourable situation in the labour market, such as unemployment, frustration and a lack of professional development (McGowan et al. 2012, Cantú Cavada et al. 2017; Ng, Fu 2018); and among opportunity-driven factors, such as, for example independence, flexibility, job satisfaction (Holmen et al. 2011; Lawter et al. 2016), and better work-life balance (McGowan et al. 2012). On the other hand, there are also researches which concentrate only on women-specific factors; for example, norms for and stereotypes about females (Kobeissi 2010; Pérez-Pérez, Avilés-Hernández 2016).

The institutional framework generally affects entrepreneurship by influencing the uncertainty and expected return on investment regardless of the gender (Chowdhury, Audretsch 2014). The informal institutions of norms, values, culture, and stereotypes are often listed as causes for the gender gap in entrepreneurship (Petrović, Radukić 2019; van Ewijk, Belghiti-Mahut 2019). The prototypical entrepreneur is perceived as masculine and individual; these features are male-stereotypes (Orser et al. 2011; Gimenez-Jimenez et al. 2020), while females are stereotypically perceived as caring and nurturing (Orser et al. 2011). Results showing that the fertility rate negatively impacts female entrepreneurship (Dutta, Mallick 2018) support this cultural impact.

The gender gap in entrepreneurship is also perceived as the result of gender inequality and discrimination against women (Estrin, Mickiewicz 2011; Berger, Kuckertz 2016) observed in the gender wage gaps (Ravazzini, Chesters 2018; Khoreva 2011), gender labour-force gap, the presence of women in positions of power (Ribes-Giner et al. 2018), human development (Maniyalath, Narendran 2016) or occupational female segregation (Damelang, Ebensperger 2020).

Education level is often seen as a factor supporting entrepreneurial activities (Westhead, Solesvik 2016), however mostly in the context of entrepreneurship education (Henry 2013; Henry, Lewis 2018), higher education (Solesvik 2013) or specifically entrepreneurship education among students (Iglesias-Sánchez et al. 2016). Although the gender gap in higher levels of educational achievement has been closing for over last 50 years, in the EU, women are more likely than men to have a high level of education, while they are still constitute only one third of entrepreneurs (Dilli, Westerhuis 2018). Comparing these facts shows that the relationship between education and female entrepreneurship is a more complex issue and requires deeper insights.

2.2. Education as a factor shaping entrepreneurship as an occupational decision

Education is a multidimensional factor, analysed not only by many scientific disciplines, but also within economics, by many kind of theories. The most influential theories regarding education as a factor shaping entrepreneurship as an occupational decision from the economic point of view are: human capital theory (education as investment, and knowledge, skills and competences as outcomes), occupational choice theory (education impacts labour market opportunities as well as entrepreneurial decisions) or institutional theory (education as the result of formal and informal institutions).

Research on the impact of human capital on entrepreneurship is vital and has been increasingly applied for over two decades (Marvel et al. 2016). Human capital is a very broad concept which refers to the knowledge, skills and competencies impacting individuals' productivity and their economic value (Marvel 2013) dividing it into general and specific human capital. The general human capital is equally effective across different contexts and situations while specific human capital is related to its usefulness in particular context (Marvel 2013; Capelleras et al. 2019). Education is one of the key drivers of the general human, and is assumed to impact entrepreneurial performance by providing discipline, motivation, self-confidence, skills and knowledge (Westhead, Solesvik 2016).

Another typology of human capital made by Marvel et al. (2016) distinguishes both its investments and outcomes. Investments in human capital are related to education, training/ experience, and investments in recruitment while outcomes are related to knowledge, skills and ability (Marvel et al. 2016). Due to data availability, human capital is the most often operationalised by its investment in formal education, measured by years of schooling or educational attainment (Faggian et al. 2017), instead of their outcomes, though cognitive, technical, problem-solving, social and managerial skills and abilities are related to entrepreneurial activity (Qian 2017), as well as education.

Formal education as a form of general human capital and entrepreneurial experience as a form of specific human capital are the most common factors considered to have an impact on entrepreneurship (Capelleras et al. 2019).

Education is often used as a control variable in the research of determinants of entrepreneurship (Hamilton et al. 2019). Entrepreneurial education is also of special interest, as it is believed that it let to acquire the skills and competences needed to increase the quantity of entrepreneurs or their competences (Honig, Samuelsson 2012; Henry 2013; Henry, Lewis 2018).

Although investment in human capital is believed to reinforce entrepreneurial outcomes, the research results show that relationship between them is not inconclusive, as it is not straightforward. The only exception seems to be formal education, which is a statistically significant factor, though small in magnitude (Hogendoorn et al. 2019). Reasons for that might be related to the endogeneity of human capital, as both are related to favourable personal traits or the correct choice of education by future entrepreneurs (Hogendoorn et al. 2019).

The perspective of occupational choice theory assumes entrepreneurship to be a choice between two forms of activity: a wage employee with a predictable and risk-free salary, or an entrepreneur gaining risky entrepreneurial profit (Kihlstrom, Laffont 1979; Bradley 2016; Pardo, Ruiz-Tagle 2017). Determinants for becoming an entrepreneur can be grouped as social-demographic factors, economic factors and personal factors (i.e. Rupasingha, Goetz 2013; Fritsch et al. 2015; Simoes et al. 2016; Szarucki et al. 2016). In this context, education is a bit of a misleading factor. Research suggests a U-shape relationship between the educational attainment and entrepreneurship, as both the highest and the lowest categories of education level are related to high the entrepreneurship rate. It is connected with the bimodal patterns of entrepreneurial entry for individuals with high job-related human capital who create the best and most successful companies, and individuals with low job-related human capital who run independent businesses but not such lucrative ones (Ohyama 2015). Individuals with higher levels of education get better job market prospects, which increases the opportunity costs for entrepreneurship as an occupational choice and impacts the higher growth aspirations of entrepreneurial activities (Capelleras et al. 2019). Initially, access to increased levels of education can lead to the reduction of opportunity entrepreneurship, as it gives the necessary skills to gain a better paid job without the risk of entrepreneurship. However, later, greater levels of education and a rising emphasis on entrepreneurship education at universities makes entrepreneurship more desirable as a career path (Cullen et al. 2014). The relationship between education attainment and entrepreneurial growth aspirations is related to several aspects. Formal education helps individuals to better recognize entrepreneurial opportunities and to have better access to entrepreneurial resources (Capelleras et al. 2019). A higher level of education also impacts access to a better social network as the result of a longer stay in the education system (Capelleras et al. 2019). The educational attainment of entrepreneurs also impacts their growth intentions, regardless of the business cycle (Giotopoulos et al. 2017).

The impact of education on entrepreneurship can be also analysed from the point of view of institutional theory, which distinguishes between formal and informal institutions (Aparicio et al. 2019; Webb et al. 2020). Formal institutions include regulations, procedures, education, family context and differential income levels, while informal ones include networks, culture, values, and beliefs (Estrin, Mickiewicz 2011; Williams, Shahid 2016).

Although education is treated as a formal institution (Estrin, Mickiewicz 2011), informal institutions such as social norms or stereotypes also impact the gendered patterns of power, influencing career choices made by men and women in the field of education (Reichborn-Kjennerud, Svare 2014). The institutions affect men and women differently; the vocational training systems can even exacerbate gender inequality (Dilli, Westerhuis 2018). The educational system seems to reinforce and the same time limit the cultural values that support opportunity entrepreneurship (Cullen et al. 2014).

2.3. Education and female entrepreneurship

The impact of education on female entrepreneurship is not clear. In developed countries, education gender gaps have narrowed, with slightly higher female educational attainment (Sung won et al. 2018); in the EU, women are more likely to reach higher education than men, while the gender gap in entrepreneurship still remains high (Dilli, Westerhuis 2018).

On one hand, some research results show that women's education is not the most important factor in becoming an entrepreneur and many entrepreneurs do not have a formal educational background for their businesses (Loh, Dahesihsari 2013). Even more, the cultural point of view suggests perceiving entrepreneurship as appropriate for uneducated women, while highly-educated women are pushed more towards formal employment (Anambane, Adom 2018). This relationship can be explained by the feminist approach to entrepreneurship, according to which knowledge, also gained in education, is created and reproduced by social conditions and positions, with gender being a social construct influencing behaviours, values and beliefs (Loh, Dahesihsari 2013). In the UK, although women have been more likely to enter university than men since the early 1990s, female students still face negative stereotypes and lowered expectations from faculty because of their gender as well as greater challenges in relation to post-degree life chances (Woodfield 2019). Female human capital can be shaped by gender-role stereotypes related to gender-related tasks and gender identification with masculine or feminine characteristics, which leads to the gendering of human capital (Westhead, Solesvik 2016).

On the other hand, the lack of formal education is believed to be one of the factor explaining the gender gap in entrepreneurship (Vukmirović 2019), as research shows the positive impact of education level on female entrepreneurship during times of crisis (Aparicio et al. 2019). Female entrepreneurship is affected by their higher level of education (Chowdhury, Audretsch 2014; Ribes-Giner et al. 2019). Formal education accumulating explicit knowledge seems to be particularly important for female entrepreneurs, as it helps them gain access to certain labour markets and social networks. Thanks to the access to the labour market, female entrepreneurs can increase their tacit knowledge related to general business skills (Chowdhury, Audretsch 2014). Education is also a factor which moderates the negative impact of the fertility rate on female entrepreneurship, as higher levels of female education can reduce this impact (Dutta, Mallick 2018).

As education is one of the factors influencing the occupational choice between paid employment and entrepreneurship, female education should be considered in a wider context. Education is a factor, which influences the development of flexible gender identities, and flexibility in career choices shapes individuals' ability to move between male-dominated and female-dominated occupations (Sung won et al. 2018). However, greater female educational attainment does not always affect better labour outcomes (Dilli, Westerhuis 2018). Occupational gender segregation is observed worldwide, as typical female-coded jobs are lower paid and give fewer career opportunities (Damelang, Ebensperger 2020). Labour market segmentation theory explains it by dividing the labour market made by gender, formal education, geographic regions, or race into two parts: the primary and secondary labour markets (Mora, Muro 2015). Men tend to concentrate in primary sectors, characterised by higher productivity and higher wages, while women concentrate in the secondary ones, being less productive and less profitable, with lower wages (Karamessini, Ioakimoglou 2007; Aidis, Weeks 2016; Symeonaki, Filopoulou 2017).

Education might be a factor in changing that segmentation. Female education in fields linked to high-growth industries is perceived as a factor which might mitigate the gender gap in entrepreneurship (Sullivan, Meek 2012). According to research results among Chinese youth, education leads to work flexibility, within which men were more likely to prefer typically masculine jobs, while women were more open to both masculine and feminine jobs (Sung won et al. 2018). In the UK, graduates of both genders are equally likely to secure paid, full-time employment within six months after graduation, but men are also more likely to report being unemployed at this point (Woodfield 2019).

Deeper understanding of the relationship looks at not just education attainment as a whole, but also some specific areas of education. The gender gap connected with female participation in STEM education (science, technology, engineering, or mathematics) negatively impacts not only total female entrepreneurial activity, but also women's entrepreneurial engagement in knowledge-intensive sectors and their high-growth aspirations (Dilli, Westerhuis 2018). Also, significant gender differences of entrepreneurial attitude are recognized among scientists as the prior record of researchers' patenting and institutional leadership influences male researchers' openness to entrepreneurship, but not female ones (Goel et al. 2015).

3. METHODS AND MATERIALS
3.1. General assumption and research hypotheses

Although, as shown in the literature review, the impact of education on female entrepreneurship is multidimensional, so far, most research associates education with higher education or years in education in the context both of general human capital (Faggian et al. 2017) and of entrepreneurship (Hamilton et al. 2019). Another attitude is to focus on the impact of entrepreneurial education (Westhead, Solesvik 2016).

Education is part of informal institutions (Estrin, Mickiewicz 2011), but is also influenced by gender social norms or stereotypes influencing career choices (Reichborn-Kjennerud, Svare 2014; Pinho 2017). This being the case, it is not just the female level of education which should be analysed, but also male education attainment. It is assumed in the paper that male education could be a factor which shapes the social environment supporting or discouraging females from entering into entrepreneurship, which led to the formulation of hypothesis 1.

H1. Female entrepreneurship is shaped by both male and female education levels, and the direct impact of female education and indirect impact of male education

To get a clearer picture of the impact of education on female entrepreneurship, the analyses of different levels of education are proposed in the paper, not just higher education, but also primary and secondary education. Considering female primary education, it is hypothesised in the paper that because of the lack of female skills and competences, the higher the share of females with primary education, the lower the level of female entrepreneurship (hypothesis 2.1). On the other hand, a relatively high level of primary education among males contributes to a higher level of female entrepreneurship, as it lowers social pressure against female entrepreneurship. Males with lower level of education are more open to professionally active women, including entrepreneurial activity, as females make important financial contributions to family incomes and males do not have enough skills and competences to create a social barrier for female entry to entrepreneurship (hypothesis 2.2).

H2.1. A higher share of females with primary education impacts lower female entrepreneurship
H2.2. A higher share of male primary education impacts higher female entrepreneurship

The opposite relationship is assumed when considering the impact of female and male secondary and higher education on women's entrepreneurship. Thanks to getting a better education, females are able to acquire more of the skills and competences needed to run a business, as well as build better social networks and gain access to finances, which lead to their higher level of entrepreneurial entry (hypotheses 3.1 and 4.1). Contrary, a higher share of males with secondary and tertiary education creates stronger social pressure against entrepreneurial women and reduces female entrepreneurship. Males with better education get their human capital developed enough to obtain a successful professional career and by that, on the one hand, expect women to concentrate more on family duties than on contributing to family finances with female entrepreneurial activity. On the other hand,

the more successful males are thanks to their higher competences, the more they also create a competitive entry barrier for women (hypotheses 3.2 and 4.2).

H3.1. A higher share of females with secondary education impacts a higher female entrepreneurship rate
H3.2. A higher share of male secondary education impacts a lower female entrepreneurship rate
H4.1. A higher share of females with tertiary education impacts a higher female entrepreneurship rate
H4.2. The higher the share of male tertiary education, the lower female entrepreneurship

3.2. Research assumptions

To verify hypotheses, empirical research was conducted to estimate the econometric models, with female entrepreneurship as the dependent variable and with the level of education as the independent one. European countries were selected for the research, as they represent similar levels of institutional environment and cultural background. Based on annual data from the Eurostat database for the years 2000-2019 for 31 countries, the panel of 620 data was created. Details on analysed countries are presented in tab. 1.

The female entrepreneurship rate as a dependent variable is calculated as the share of females self-employed in total self-employment for a population aged 15 to 64 years. On average, over a 20 year period, the female entrepreneurship rate in selected European countries was 30,75, meaning that women were 30,75% of entrepreneurs. Comparing the average rates of female entrepreneurship in the analysed countries (tab. 1), significant differences among countries can be observed. The average female entrepreneurship rates differ from 16,79% in Malta to 39,65% in Portugal. Female entrepreneurship rates are lower than the European average in the case of 18 countries and higher than the European average in the case of 13 countries.

Table 1. Country's average female entrepreneurship rates (FE) in years 2000-2019

FE LOWER THAN SAMPLE AVERAGE (30.75)		FE HIGHER THAN SAMPLE AVERAGE (30.75)	
Country	**FE average**	**Country**	**FE average**
Malta	16.79	Portugal	39.65
Ireland	20.08	Latvia	38.66
Denmark	26.31	Lithuania	38.12
Sweden	26.94	Switzerland	36.04
Slovakia	26.97	Croatia	35.30
Romania	27.64	Luxembourg	35.26
Slovenia	27.98	Austria	34.86
Czechia	28.66	Netherlands	34.17
Italy	28.66	Poland	34.05
Cyprus	28.70	Bulgaria	33.63
Norway	28.79	Finland	32.62
Greece	29.24	Hungary	32.25
Iceland	29.55	Germany	31.50
United Kingdom	29.72		
France	29.87		
Estonia	30.44		
Belgium	30.62		
Spain	30.62		

Source: own calculations based on Eurostat data

Independent variables reflect the level of education for men and women, measured as the share of males and females with primary, secondary and tertiary education attainment in the total population. Two control variables are also implemented in the estimations: the female unemployment rate and the share of females inactive because of family and caring responsibilities in the total population. All independent and control variables relate to persons aged 15-64 years, similarly to the dependent variable. Raw data were converted into a natural logarithm to linearize the relationships. Definitions and abbreviations of all variables are presented in tab. 2.

Table 2. List of variables and their abbraviations

Variable	Abb.	Operationalization
Female entrepreneurship	lnFE	Female entrepreneurship rate being the share of female entrepreneurs (%) in total entrepreneurs converted into natural logarithms
Females with primary education	lnFP	Female primary education being the share of females with primary education (%) in total population converted into natural logarithms
Males with primary education	lnMP	Male primary education being the share of males with primary education (%) in total population converted into natural logarithms
Females with secondary education	lnFS	Female secondary education being the share of females with secondary education (%) in total population converted into natural logarithms
Males with secondary education	lnMS	Male secondary education being the share of males with secondary education (%) in total population converted into natural logarithms
Females with tertiary education	lnFT	Female higher education being the share of females with tertiary education (%) in total population converted into natural logarithms
Males with tertiary education	lnMT	Male higher education being the share of males with tertiary education (%) in total population converted into natural logarithms
Female inactivity	lnFIR	Female inactivity rate being the share of females inactive because of family and caring responsibilities (%) in total population converted into natural logarithms
Female unemployment	lnFU	Female unemployment rate being the share of unemployed females (%) in female population converted into natural logarithms

Source: own elaboration.

As in terms of female entrepreneurship significant differences are observed in European countries, despite the institutional and cultural convergence of European countries, the hypotheses verification is done based on the whole group of countries and separately for the groups of countries with relatively low and relatively high female entrepreneurship according to the values presented in Tab. 1.

With the use of panel regression models, three sets of regression functions are estimated:
- with primary education level for females and males as independent variables in whole group of 31 European countries (Reg.1), in countries with relatively low (Reg.4) and relatively high (Reg.5) female entrepreneurship;
- with a secondary level of education for both genders as independent variables in whole group of 31 European countries (Reg.2), in countries with relatively low (Reg.6) and relatively high (Reg.7) female entrepreneurship;
- with a tertiary level of education for women and men as independent variables in whole group of 31 European countries (Reg.3), in countries with relatively low (Reg.8) and relatively high (Reg.9) female entrepreneurship.

In all 3 sets of regression functions, both the share of inactive females because of family duties and female unemployment rates as control variables are implemented.

The calculation of the variance inflation factors (VIF) is the next step (tab. 3), to detect collinearity. In most cases Reg.1, Reg.3, Reg.4, Reg.5, Reg.8 and Reg.9 collinearity problems are not encountered, since all of the variables

reported VIF values significantly below 10. In the case of Reg.2, Reg.6 and Reg.7, the share of males with secondary education is collinear according to VIF values, which is why this variable is excluded from the next steps. After doing so, VIFs values do not indicate any problem with collinearity.

Table 3. VIFs collinearity tests with FE as dependent variable

Variables	VIFs Reg.1	VIFs Reg.4	VIFs Reg.5	Variables	VIFs Reg.2	VIFs Reg.6	VIFs Reg.7	Variables	VIFs Reg.3	VIFs Reg.8	VIFs Reg.9
lnMP	6.165	7.217	5.882	**lnMS**	X	X	X	**lnMT**	3.660	9.653	2.623
lnFP	6.284	7.399	6.303	**lnFS**	1.002	1.018	1.006	**lnFT**	3.738	9.945	2.620
lnFIR	1.136	1.192	1.469	**lnFIR**	1.042	1.146	1.089	**lnFIR**	1.255	1.289	1.633
lnFU	1.072	1.138	1.120	**lnFU**	1.042	1.135	1.087	**lnFU**	1.220	1.148	1.665

Source: own elaboration

To determine the kind of panel regression, the Breuch-Pagan and Hausman tests were conducted (tab. 4). Statistics of Breuch-Pagan test indicate whether oridinary least squares or panel regression method should be used. As all statistics get a low p-value (<0.05), it means the correctness of panel regression implementation. The Hausman test allows for estimating the nature of the observed effect in panel data between fixed and random effects. A low p-value (<0.05) for the Hausman test suggests using the model with the fixed effects. As in all regression cases (tab. 4), the p-values of the Hausman test are much higher than 0.05, and the panel regression with random effects is the best method for estimation of Reg.1, Reg.2, Reg.3, Reg.4, Reg.5, Reg.6, Reg.7 and Reg.8 and fixed effects for Reg.9.

Table 4. Breusch-Pagan and Hausman test results with FE as dependent variable

Tests		Reg.1	Reg.2	Reg.3	Reg.4	Reg.5	Reg.6	Reg.7	Reg.8	Reg.9
Statistics of Breusch-Pagan test	LM	3784.79	3345.96	4008.94	1636.51	604.758	1213.62	640.397	1877.76	712.881
	p	0	0	0	0	0	0	0	0	0
Statistics of Hausman test	H	3.603	0.698	4.3798	6.978	5.185	1.385	4.202	2.654	9.900
	p	0.463	0.874	0.3570	0.137	0.269	0.709	0.241	0.617	0.042

Source: own elaboration.

4. RESULTS AND DISCUSSION

The results of estimating regression function parameters based on panel regression with fixed and random effects are presented in tab. 5. Regarding primary education (Reg.1), the share of males with primary education impacts female entrepreneurship positively, while the share of women with primary education impacts negatively, meaning a higher share of males with primary education and a lower share of females with primary education influences a higher level of female entrepreneurship. It gives support for hypotheses H.2.1 and H.2.2. When secondary education is considered (Reg.2), the share of males with secondary education is not implemented as an independent variable because of collinearity (tab. 3), making hypothesis 3.2 impossible to verify. However the share of females with secondary education positively impacts female entrepreneurship, meaning that a higher level of secondary education among women influences their higher entrepreneurial activity. It gives support for hypothesis 3.1. The last regression function (Reg.3) refers to higher education, and it shows that the share of males with higher education negatively impacts female entrepreneurship, while the share of women with higher education impacts positively. These results support hypotheses 4.1 and 4.2, which assume that higher female entrepreneurship is shaped by a higher share of females with tertiary education and a lower share of males with tertiary education. All the results of regression functions also support hypothesis 1, which assumed that female entrepreneurship is shaped by both male and female education levels.

Table 5. Regression functions parameters with FE as dependent variable

Variables	Full sample of countries	Countries with low FE	Countries with high FE
Models with primary education			
	Reg.1	**Reg.4**	**Reg.5**
Const	3.832***	4.240***	3.622***
	(0.081)	(0.113)	(0.077)
lnMP	0.195***	0.050	0.241***
	(0.072)	(0.088)	(0.082)
lnFP	−0.397***	−0.429***	−0.223***
	(0.055)	(0.066)	(0.067)
lnFIR	−0.017**	−0.031***	−0.071***
	(0.008)	(0.009)	(0.016)
lnFU	0.069***	0.063***	0.018
	(0.011)	(0.015)	(0.012)
Fit statistics	'Between' variance = 0.033 'Within' variance = 0.006	'Between' variance = 0.25 'Within' variance = 0.007	'Between' variance = 0.006 'Within' variance = 0.003
Models with secondary education			
	Reg.2	**Reg.6**	**Reg.7**
const	3.073***	2.494***	4.274***
	(<0.0001)	(0.159)	(0.112)
lnFS	0.097***	0.235***	−0.177***
	(0.007)	(0.049)	(0.034)
lnFIR	-0.024***	−0.012	−0.093***
	(0.006)	(0.011)	(0.013)
lnFU	0.0421***	0.064***	0.013
	(0.001)	(0.019)	(0.011)
Fit statistics	'Between' variance = 0.032 'Within' variance = 0.009	'Between' variance = 0.023 'Within' variance = 0.011	'Between' variance = 0.005 'Within' variance = 0.003
Models with tertiary education			
	Reg.3	**Reg.8**	**Reg.9**
Const	3.005***	2.556***	3.752***
	(0.061)	(0.087)	(0.075)
lnMT	−0.333***	−0.177*	-0.320***
	(0.057)	(0.095)	(0.058)
lnFT	0.435***	0.414***	0.271***
	(0.042)	(0.068)	(0.048)
lnFIR	0.001	−0.006	-0.069***
	(0.007)	(0.008)	(0.016)
lnFU	0.051***	0.071***	0.007
	(0.010)	(0.014)	(0.011)
Fit statistics	'Between' variance = 0.035 'Within' variance = 0.006	'Between' variance = 0.027 'Within' variance = 0.006	LSDV R^2 = 0.68 Within R^2 = 0.30

Note: standard errors in parentheses.
*** $p < 0.01$; ** $p < 0.05$, *$p < 0.1$
Source: own elaboration.

The results of estimating regression function parameters separately for groups of countries with lower and higher than average levels of female entrepreneurship mostly are in line with results for all countries (see tab. 5). Results give significant support for hypotheses H2.1, H4.1 and H4.2 as the share of females with primary education negatively impacts (Reg.4 and Reg.5), the share of females with higher education positively impacts and the share of males with higher education negatively impacts (Reg.8) and (Reg.9) female entrepreneurship in both group of countries. Hypothesis 2.2 gets some support, as the share of males with primary education impacts female entrepreneurship positively in the case of countries with high female entrepreneurship (Reg.5), but this variable is statistically insignificant in the case of countries with low female entrepreneurship (Reg.4).

The differences in determinants between countries with high and low female entrepreneurship can be observed when secondary education is considered. It is the same for the whole group of European countries; also, for both sub-groups, the share of males with secondary education is not implemented as an independent variable because of collinearity (tab. 3), which means that hypothesis 3.2 could not get support. Contrarily, the impact of the share of women with secondary education depends on the country's level of female entrepreneurship. In countries with a lower than average level of female entrepreneurship, the share of females with secondary education influences female entrepreneurship positively, while in countries with higher than average level, it affects it negatively, which does not support hypothesis 3.1.

Looking through all the results, hypothesis 1, assuming that female entrepreneurship is impacted by both male and female education levels, got support. In both the group of all countries and separately for countries with different levels of female entrepreneurship, shares of males with primary and higher education impact female entrepreneurship, as does the share of females with all three educational attainments. The only factor impossible to verify is the share of males with secondary education because of its collinearity with other variables and due to this, its exclusion from the regression functions.

The next aspect worthy of notice is that when comparing the absolute values of regression function parameters, female entrepreneurship rates seem to be more sensitive to the level of female education in countries with a relatively lower level of female entrepreneurship.

CONCLUSIONS

The gender gap in entrepreneurship is still an unexplained phenomenon, with the level of education as one of its causes. However, although in European countries, women obtain higher education more often than men, they are half as likely to enter into entrepreneurship. Education is a multidimensional factor shaping occupational decisions, being explained by human capital theory (education, which impacts knowledge and skills), institutional theory (education as the result of formal and informal institutions) or occupational choice theory (education impacts labour market opportunities as well as entrepreneurial decisions).

In earlier research, education as a factor influencing female entrepreneurship is mostly considered in the context of the share of females with higher education, or it is treated as a control variable. Moreover, female education is mostly analysed without regard for lower levels of education and out of context of male education.

There are two aspects in the research which constitute novelty. First is the assumption that female entrepreneurship is explained by both male and female education levels. Both genders create the social environment for entrepreneurship; female education has a direct impact through the skills and competences gained by formal education and work experience, while male education impacts indirectly by influencing the social norms and expectations or standards for running a business. The second aspect is the assumption that female entrepreneurship is explained by different levels of education (primary, secondary and tertiary), which impact their decisions to enter entrepreneurship.

Using the panel regression method, with panel data for 31 European countries for the years 2000-2019, hypothesis H1 on the impact of both male and female education levels on female entrepreneurship gets support. The most clear relationship picture is connected with females' primary and higher education and with males' higher education. Results for the whole sample of countries and for both sub-samples with higher and lower than average levels of female entrepreneurship indicate that the share of females with primary education (hypothesis H2.1) and the share of males with higher education (hypothesis H4.2) negatively impacts female entrepreneurship, while the share of females with higher education impacts positively (hypothesis H4.1). The share of males with primary education reduces the gender gap in entrepreneurship, positively influencing female entrepreneurship (hypothesis

H2.2) in the whole group of countries and in sub-group with a higher level of female entrepreneurship, while this factor is not statistically significant in the case of countries with a lower level of female education.

The most unclear results are related to the impact of secondary education on female entrepreneurship. In the panel of all countries and in the sub-panel of countries with a low level of female entrepreneurship, the share of females with secondary education positively influences women's entrepreneurship (hypothesis H3.1); however, for the sub-panel of countries with a higher level of female entrepreneurship, this relationship is the opposite. On the other hand, the impact of the share of males with secondary education on female entrepreneurship (hypothesis H3.2) is impossible to analyse because of the collinearity of this variable with other variables in the model, thus excluding it from estimations.

The results of the research have some implications for shaping policies reducing the gender gap. To raise the level of female entrepreneurship, increasing the share of women with higher education is important, but so is the reduction of primary education by encouraging females to continue their education. As one of the factors limiting female entrepreneurship is the share of males with higher education, it seems important to raise the societal aspect of the gender gap by increasing male openness towards and awareness of female entrepreneurial activity.

Research has also its limitiation related to availability and nature of panel data. Research was limited to European countries showing relationships at macro level, not at a level of particular country or at personal level.

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Aleksandra GAWEL is a Professor of Economics at the Poznan University of Economics and Business in Poland. She received her Ph.D. in 1997, habilitation (post-doc degree) in 2008 and professorship of economic science from the President of Poland in 2015. She is the author or co-author of publications on entrepreneurship, entrepreneurial education, innovation, the business cycle, the labour market, and regional development. Her current research is focused on the sustainable aspects of entrepreneurship, mostly in the context of social and gender equality.
ORCID ID: 0000-0002-7426-3474

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FACTORS INFLUENCING WAYS OF ORGANISING LIFE IN OLD AGE IN THE CONTEXT OF SOCIAL EXCLUSION RISK. THE CASE OF POLAND

Monika Adamczyk

Institute of Sociological Sciences, The John Paul II Catholic University of Lublin, Al. Racławickie 14, 20-950 Lublin, Poland

E-mail: mdadamczyk@kul.pl

Abstract. Strategies of organizing one's life in old age are a broad topic, involving the material-economic, social and psychological aspects. In its fundamental meaning, it refers primarily to everyday activities such as personal care and getting around, as well as social roles such as interpersonal relationships and relaxation. Although the constraints to the participation in normal ageing are well-known, little research has been devoted to planned old-age life organization strategies employed with the view to alleviating the constraints and counteracting social exclusion of elderly people which may be a consequence of a disruption of social participation. The aim of the present paper is to examine the relationships between socio-demographical variables such as age and sex and preferred old-age organization strategies. The research was conducted by means of a diagnostic survey (face-to-face interviews) with the use of the computer assisted interview questionnaire technique. CAPI interviews (Computer Assisted Personal Interview) were carried out in respondents' homes on a nationwide random sample of households – 1006 people aged 15 and over. The sampling frame was the PESEL. A six-item original scale was introduced in order to identify the coping strategies in old age. Statistical analysis was performed using the non-parametric tau-Kendall correlation coefficient with the view to assessing the relationship between socio-demographical variables such as age and gender and old-age life organization strategies. The results: Irrespective of the respondent's age and of their gender, adult Poles definitely preferred old-age life organization strategies consisting in remaining in their own flat and using the natural support system based on a primary network that is bonds with children, the spouse and extended family. Statistical analysis showed a lack of relationship between coping strategies and age and gender. Age and gender do not co-occur with the choice of life organisation strategies in old age.

Keywords: elderly people; social exclusion; social support; sustainable development

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Additional disciplines: sociology

1. Introduction

The number of elderly people requiring care is predicted to at least double over the next years. The worrying fact is that governments of numerous countries have difficulty ensuring high quality care to people with limited functional and cognitive capacities. As prognoses indicate, in the year 2050 there will be more than double the number of people over 80 than now, developed countries will deal with a progressive process of double ageing. The percentage of people of this age group in the general population will increase from 3.9 % in 2010 to 10 % in 2050 in OECD countries and from 4.7 % to 11.3 % in 26 EU member countries and Great Britain (OECD, 2021). It is estimated that even half of them will need assistance in their everyday lives, therefore it is of great importance to identify problems of people experiencing their old age today as well as to learn the opinion on organizing their lives in this phase of the people who have not yet crossed the conventional threshold of old age. The threshold of old age adopted in the present paper is turning 60. Adopting this threshold is associated primarily with the definition of an elderly person adopted in the Polish official statistics according to which the elderly are people aged 65 and over or 60 and over. The adoption of such a definition is connected with the fact that the retirement age for men and women is not the same. Most commonly, the uniform age of 60 or 65 is adopted or a separate age is introduced for men (65) and for women (60). UN studies apply a uniform age of 65 for men and women (World Report on Ageing and Health 2015). The cultural, social and economic 'borders' of old age are becoming blurred, shifting the phase of late adulthood and old age proper into the depths of human life – 50-75 years and over 75 years respectively (Garfein, Herzog, Robust 1995; Hellström, Andersson, Hallberg, 2004; Adamczyk, 2019). As human life expectancy increases and, consequently, the threshold for retirement is pushed back, it may not be long before other measures are introduced to serve demographers and economists.

One needs to redefine old age in its social dimension and to identify strategies of coping with potential problems appearing in this phase of life (Avers, 2020; Aspalter, 2020; Ribeiro, Silva Borges, Cavalcanti Ferreira de Araujo, Santos Souza, 2017). This is important for several reasons. Firstly, ageing is not necessarily associated with a decline in mental and physical performance or withdrawal from social roles. This has been confirmed by numerous studies on human development across the life course (Baltes, Baltes, 1990; Fernández-Ballesteros et al., 2010). Secondly, as written earlier, according to WHO estimates, between 2000 and 2050 the population of people aged 60 and over will triple (from 600 million to 2 billion). The problem of ageing societies affects all countries, but is most pronounced in underdeveloped countries, where the number of elderly people will increase from 400 million in 2000 to 1.7 billion in 2050. This demographic shift will have a significant impact on public health and welfare systems (World Report on Ageing and Health 2015). Thirdly, people who, because of their state of health, are forced to rely on long-term care should be provided with such a possibility in the form of an institutional infrastructure as well as qualified staff. The quality of long-term care in old age is important for three reasons. Firstly, users of care services are demanding more voice and control over their lives, which means that they are becoming informed consumers of care services. Secondly, as the cost of care services continues to rise – from 1.6% of GDP in OECD countries to at least double that by 2050 – long-term care services are under pressure to improve their accountability. Thirdly, governments have a responsibility to protect vulnerable older people from potential abuse and age-based social exclusion (OECD, 2013).

2. Social exclusion – the development of the conception

The concept of social exclusion has evolved over time and adapted to national contexts (Daly, Silver, 2009; Betlej, 2017; Čižo et al., 2020; Fedulova et al., 2019; Lankauskienė et al., 2012; Betlej, 2019). Although it is linked to the concept of poverty, it emphasises the dynamics of social maladaptation or social disqualification (Silver, 2019). In the European Union, the discourse on social exclusion has been ongoing since the 1970s, successive years have brought new resolutions and solutions to combat social exclusion (1989 resolution on combating social exclusion (Publications Office of the EU, 1989), a commitment also included in the Amsterdam Treaty of 1997. As a result of the Lisbon process, economic and social policies were combined under the

European 'social model.' In order to act more effectively and monitor changes in social exclusion, the Member States agreed in 2001 on a set of common objectives and 18 social indicators designed to facilitate a voluntary, open and, importantly, effective method of coordination between different national social policies. Most indicators relate to income and employment; a few relate to health and education, but these are still evolving. Progress in the area of social exclusion over the years has not been satisfactory, and in order to increase the effectiveness of actions, the European Year for Combating Poverty and Social Exclusion was declared and the EU introduced Agenda 2020, in which social inclusion was one of the five objectives. The European Platform against Poverty and Social Exclusion set a headline target of reducing the number of people at risk of poverty and social exclusion by 20 million (Silver, 2019). It is common to equate the conception of social exclusion with poverty, social inequality, and marginalisation and discrimination or the emergence of an underclass within the social structure (Hickey, du Toit, 2007). This is a simplified approach, as poverty itself may not be a cause but rather an effect of exclusion, and defining social exclusion is often linked to the perspective of discipline, context and even political efforts to counteract disadvantage (Silver 1995; Smirnov A. et al., 2019).

The concept of social exclusion is present in several theoretical traditions. The first approach is associated with French sociology and emphasises the dynamic and processual nature of exclusion in its relational, symbolic and economic dimensions. It is referred to in the literature as the solidarity paradigm (Silver, 1994: 550-555). A crucial assumption is linked to the discourse on 'solidarity', the 'social contract.' Concern is expressed about the weakening or breaking of the social bond, which introduces risks for the individual in terms of 'material and symbolic exchange with the larger society' (Silver 1995: 66-67). The second approach, identified by Silver as the monopoly paradigm, is related to the conception of social exclusion present in the Anglo-Saxon tradition. This approach emerged from critical social policy and debates about disadvantage. The Anglo-Saxon perspective emphasised considerations of civil rights, opportunities for full participation in society and power imbalances resulting from obligatory, hierarchical social structures (Silver 1994: 561-569). A third approach called the specialisation paradigm is associated with American and British discourse. In this paradigm, liberal ideologies emphasise concepts of contractual and voluntary exchange of rights and responsibilities, where individual differences lead to specialisation in competitive spheres involving the market and social groups. Exclusion is perceived as a product of discrimination, lack of enforcement or inadequate enforcement of rights by the liberal state, barriers to movement/exchange between spheres and market failures (Silver, 1994: 555-561).

Social exclusion can take the form of controlling access to space as well as to activities, resources and information. In his classic essays on 'The Stranger' and 'The Social Frontier', Simmel gave rise to considerations of 'social distance.' The extent and persistence of spatial segregation within a group often reflects its social distance or marginality from the mainstream. However, as Simmel noted, people can be physically close, as in a metropolis, but not socially close (Simmel, 2006: 204-212). Adopting this perspective is very important in the context of factors that influence the risk of social exclusion of older people. According to WHO estimates, between 2000 and 2050 the population of people aged 60 and over will triple (from 600 million to 2 billion).

This paper assumes an approach that sees social exclusion as a particular form of rupture of social ties, a fracture in the social fabric and a deficit of solidarity (Silver, 2008). The adoption of the solidarity paradigm in analyses of social exclusion is related to the specific research problem of coping strategies in old age. This perspective also allows one to understand that the individual's coping strategy in old age may determine whether or not they will be subject to exclusion based on breaking ties with the family, the environment. Older people are a group particularly prone to social exclusion, however – which also applies to Polish pensioners – not because of the threat of poverty. The economic situation of older Poles is surprisingly good compared to other European countries since only a few percent of them are at risk of poverty (The Social Situation in the European Union 2007, 2008, 2009; Social Situation Monitor – Research findings 2020). When drawing conclusions, however, one should bear in mind the very large differences in income and living standards between the societies of individual countries.

3. Research Methodology

3.1. Method

The aim of the research was to identify strategies for coping with problematic situations in old age in the context of social exclusion risk. The research problem posed in the article does not focus on social exclusion conceived of as the threat of poverty, but captures this phenomenon as a form of rupture of social ties, rupture of the social fabric and solidarity deficit. In this context, the research aimed to identify factors associated with particular coping strategies for potential problematic situations that may occur in old age. In order to identify coping strategies in old age, 1006 adult Poles were surveyed. The research was carried out by means of a diagnostic survey (face-to-face interviews) using a computer-assisted interview questionnaire technique. CAPI (Computer Assisted Personal Interview) interviews were conducted at the respondents' homes on a nationwide random sample of households. The sampling frame was PESEL. With the view to identifying coping strategies in old age, an original six-point scale was employed. The application of such a research technique was aimed at determining the preferences of adult Poles regarding the forms of organisation of their life in old age, as well as at discovering the conditions for the choices made.

3.2. Participants

The study involved 1006 adult Poles aged 15 and over, in order to identify groups of respondents according to the life phase they are in, variables were recoded and four age groups were created corresponding in some respects to the life phases proposed by Daniel J. Levinson (Levinson, 1959, 1977,1978). Adopting this division created four groups: people aged 15-20 accounted for 7.1% of all study subjects (71), people aged 21-40 33.4% of all study subjects (336), people aged 41-59 30.2% of study subjects (304) and people aged 60 years and over 29.3% of all study subjects (295). The gender distribution of the survey population was as follows: (485) 48.2% of survey respondents were male and (521) 51.8% were female.

3.3. Tools

In order to identify which, in the opinion of the respondents, are the best strategies for organising life in old age, a proprietary tool was used in the form of a scale consisting of five statements to which the participant had to respond on a scale from one to six. Description of the scale: The scale consisted of statements which concerned the ways of organising life in old age and the extent to which the given strategies satisfy the needs of the elderly: living in one's own flat and using temporary help from people close to oneself – family, friends, neighbours; living in one's own flat, with the help of third persons, e.g. a carer for the elderly; sharing one's own flat with the help of third persons, e.g. a carer for the elderly; sharing the home with children, grandchildren or extended family; living together with other older people, e.g. in a nursing home, a rest home; living in one's own home with the support of day care centres.

4. Results

In order to determine the most frequently selected strategies of organising one's life in old age, so as to cope with problems that may occur in this life period, the author's measurement scale was employed, referring to five possible ways of organising one's life (living in one's own flat and using temporary help of people close to oneself – family, friends, neighbours; living in one's own flat, having the assistance of third persons, e.g. a carer of an elderly person; sharing a flat with one's children, grandchildren or extended family; living together with other older people e.g. in a nursing home, a rest home; living in their own flat with support of day care centres). Respondents were asked to rate the extent to which individual strategies meet the needs of older people on a scale of one to six, where 1 meant do not meet the needs of older people at all and 6 meant do not know/hard to say.

The analysis of source materials shows that in Poland, the elderly can rely primarily on the help of their immediate family (Błędowski, Szatur-Jaworska, Szwed-Lewandowska, Kubicki, 2012, p.101; Błędowski, Szatur-Jaworska, 2017, pp.36-40). There is also a clearly marked neighbourhood solidarity. Acquaintances and friends are less likely to provide support to the elderly, while assistance from institutions established to provide it is by far the least frequent. The analysis of the data shows that the most popular strategies of organising one's life in old age are those which include living in one's own flat and taking advantage of social support from the closest family. For 55.3% of all respondents, it is living in their own flat and possibly using the support of the closest people: family, friends that is the best strategy. Equally popular is the strategy of living in one's own flat and using the assistance of supportive persons (50.4%). The least popular strategy to organise one's life in old age among respondents is to live with other elderly people in institutions dedicated to elderly people such as Social Assistance Homes, Rest Homes. A total of 28% of respondents think that these types of institutions do not satisfy or satisfy to a very little extent the needs of older people.
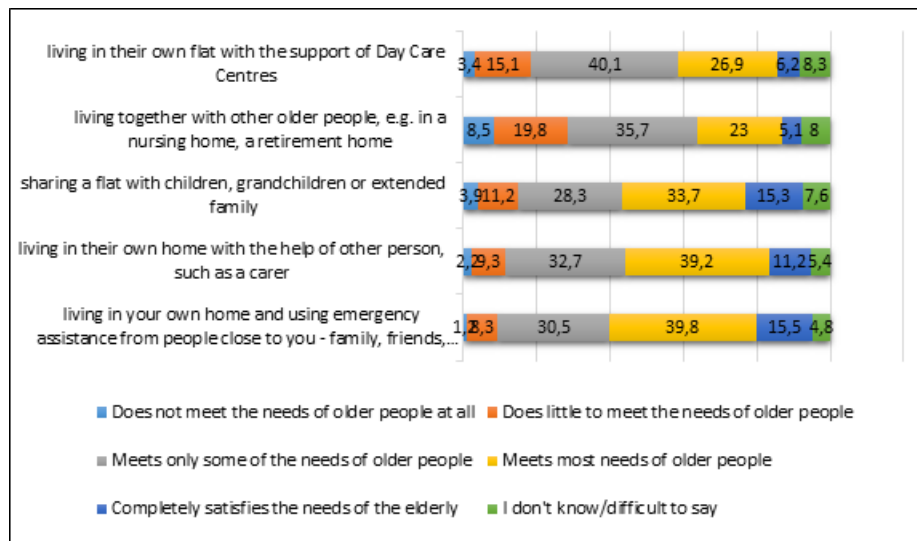
Figure 1. Strategies for organising one's life in old age in % (N =1006)
Source: Own study

The adoption of a social support formula based on strong family and friendship ties is strongly associated with the possibility of counteracting social exclusion consisting in breaking the ties with the family, neighbourhood or friendship environment. This structural social support, distinguished from other networks by the fact of the existence of social contacts, ties, affiliation and performing the function of helping people in difficult situations (Sęk, 2004), seems to be a very popular strategy for organising life in old age. The figure 2 below shows how the strength of ties, contacts and affiliations is distributed depending on the entities associated with the elderly person; the closer to this person, the stronger the ties.
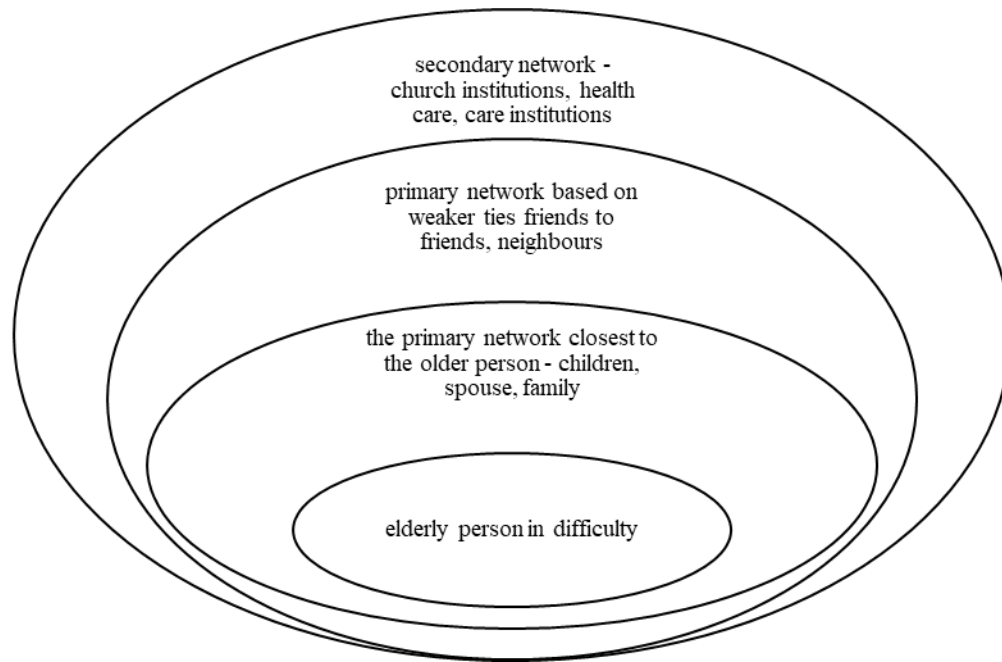
Figure 2. Diagram of the strength of the relationship between the older person and the environment
Source: Own study

Another point of the research was to define factors conditioning the adoption of a particular strategy of organising life in old age. The study assumed that age is one of the important factors influencing which strategy is considered to be good in meeting the needs of older people. It was presumed that the support for strategies based on living in one's own flat and using the support of family and relatives would increase with age. This assumption was based on the analysis of source data, according to which in Poland, in most cases, it is the family that provides informal care services to seniors. Care within the family for an elderly person is very often perceived as an obligation resulting from the fact that parents or grandparents devoted both financial and time resources at earlier stages of their lives to the younger generation (Błędowski, Szatur-Jaworska, Szwed-Lewandowska, Kubicki, 2012, p.101; Błędowski, Szatur-Jaworska, 2017, 36-40). The results of the conducted research confirmed this assumption. Clearly, the strategy of organising life in old age consisting in living in one's own flat and using temporary support from family or friends gains importance with age. It appears that as one moves into older age groups, the strategy of organising one's life in old age assuming social support, referring to temporary help from loved ones and relying on living in one's own flat gains in importance. For almost 60 % of the respondents aged 60 and over, this is the strategy that fully or mostly satisfies the needs of older people. More than half (53.9 %) of respondents in the 41-59 age group believe similarly. A detailed breakdown of the data is presented in the table 1 below.

Table 1. The way of organising life in old age: living in own flat and using temporary help of close people – family, friends, neighbours, by age groups in %.

Does the following way of organising old age meet the needs of older people: living in your own flat and using temporary help from relatives - family, friends, neighbours?							
	Does not satisfy elderly people's needs at all	Satisfies elderly people's needs to a little extent	Satisfies only some elderly people's needs	Satisfies most elderly people's needs	Fully satisfies elderly people's needs	Don't know/hard to say	Total
15-20	4.2%	8.5%	26.8%	38.0%	12.7%	9.9%	100%
21-40	1.5%	8.0%	30.1%	36.3%	17.3%	6.8%	100%
41-59	0.7%	9.9%	32.9%	42.1%	11.8%	2.6%	100%
60 and over	0.7%	6.8%	29.5%	41.7%	18.0%	3.4%	100%

Source: Own study

Similarly, the strategy based on independent living and the use of temporary support from third persons is assessed in a positive light. Moving from the youngest age group to the increasingly elderly, there is a rise in support for this strategy of organising life in old age. It is considered to completely satisfy and to satisfy most of the needs of older people by respectively 46.5% of those aged 15-20, 51.5% of those aged 21-40, 49.7% of those aged 41-59 and 50.9% of those aged 60 and over. A similar relationship can be observed in the case of living together with children, grandchildren or extended family. Detailed data distribution is presented in the table 2 below.

Table 2. Way of organising life in old age, according to age groups in %

Does the following way of organising life in old age meet the needs of older people?							
	Does not satisfy elderly people's needs at all	Satisfies elderly people's needs to a little extent	Satisfies only some elderly people's needs	Satisfies most elderly people's needs	Fully satisfies elderly people's needs	Don't know/hard to say	Total
living in their own home with the help of a third person, such as a carer of an elderly person							
15-20	5.6%	12.7%	21.1%	35.2%	11.3%	14.1%	100%
21-40	2.1%	8.9%	29.8%	40.5%	11.0%	7.7%	100%
41-59	1.0%	9.2%	37.5%	40.5%	9.2%	2.6%	100%
60 and over	2.7%	9.2%	33.9%	37.3%	13.6%	3.4%	100%
sharing a flat with children, grandchildren or extended family							
15-20	2.8%	16.9%	28.2%	28.2%	14.1%	9.9%	100%
21-40	3.3%	10.4%	29.2%	31.5%	16.4%	9.2%	100%
41-59	4.3%	11.5%	29.6%	35.9%	12.5%	6.3%	100%
60 and over	4.4%	10.5%	26.1%	35.3%	17.3%	6.4%	100%

living in their own flat with the support of day care centres						
15-20	2.8%	15.5%	33.8%	26.8%	4.2%	16.9%	100%
21-40	3.0%	13.4%	39.3%	27.1%	7.7%	9.5%	100%
41-59	3.9%	16.4%	42.1%	25.0%	5.3%	7.2%	100%
60 and over	3.4%	15.6%	40.3%	28.8%	5.8%	6.1%	100%
living together with other older people, e.g. in a nursing home, a retirement home						
15-20	4.2%	21.1%	31.0%	29.6%	0.0%	14.1%	100%
21-40	8.3%	18.8%	33.0%	23.2%	6.8%	9.8%	100%
41-59	8.6%	21.1%	36.2%	22.7%	4.6%	6.9%	100%
60 and over	9.8%	19.3%	39.3%	21.4%	4.7%	5.4%	100%

Source: Own study

Irrespective of age, the studied respondents support the most the strategies which are based on independent living and temporarily relying on the assistance of other people, preferably the help of the loved ones. This model is the most popular and indicates a reference, in planning one's own old age or in experiencing one's current old age, to a sense of connection with one's surroundings and loved ones, based on a network of social contacts, ties and affiliations linked above all to one's own living environment and family.

In addition to age, it was assumed that gender could be a factor influencing the choice of one of the proposed strategies. As in the case of age, gender does not correlate with the choice of living arrangement strategy in old age. This means that regardless of gender, respondents favoured the strategy of living in their own flat and using temporary help, preferably provided by relatives and friends. The detailed data distribution is presented in the summary table 3 below.

Table 3. Way of organising life in old age, according to gender in %

Does the following way of organising life in old age meet the needs of older people?						
	Does not satisfy elderly people's needs at all	Satisfies elderly people's needs to a little extent	Satisfies only some elderly people's needs	Satisfies most elderly people's needs	Fully satisfies elderly people's needs	Don't know/hard to say	Total
living in your own home and using temporary assistance from people close to you – family, friends, neighbours						
man	1.4%	6.8%	31.3%	39.6%	14.6%	6.2%	100%
woman	1.0%	9.6%	29.8%	39.9%	16.3%	3.5%	100%
living in their own home with the help of a third person, such as a carer for an elderly person						
man	3.3%	9.3%	31.1%	40.0%	10.1%	6.2%	100.0%
woman	1.2%	9.4%	34.2%	38.4%	12.3%	4.6%	1.2%
sharing a flat with children, grandchildren or extended family						
man	4.5%	12.2%	27.2%	32.6%	16.5%	7.0%	100.0%
woman	3.3%	10.4%	29.4%	34.7%	14.2%	8.1%	100%
living in their own flat with the support of day care centres						
man	7.0%	22.1%	36.1%	22.1%	4.9%	7.8%	100%
woman	10.0%	17.7%	35.3%	23.8%	5.2%	8.1%	100%
living together with other older people, e.g. in a nursing home, a retirement home						
man	3.7%	15.1%	41.4%	24.1%	5.6%	10.1%	100%
woman	3.1%	15.2%	38.8%	29.6%	6.7%	6.7%	100%

Source: Own study

5. Doscussion and Conclusions

The study aimed to determine the relationship between sociodemographic factors such as age and gender, among others, and the choice of strategies for organizing life in old age when some problems arise. Human life changes with age both under the influence of changes occurring in the body (Goto, 2015; Paskaleva, Tufkova 2017) and under the influence of social opinion, which often perpetuates the sad stereotype of old age (Martin-Matthews, 2000). The course of aging is greatly affected by negative experiences, such as the loss of loved ones, the departure of children or bad contacts with them, deteriorating material situation, a fear of illness and infirmity, a sense of loneliness. States of depression are also caused by chronic illnesses and ailments (Jolanki, 2004.)

There is an inherent risk of disease and disability associated with normal physiological ageing. However, people who take care of their physical health and avoid risky behaviours are more likely to live healthy into old age (Rowe, Kahn, 1987). Healthy ageing refers to the absence of chronic conditions, relative freedom from physical and functional limitations (Rogers, 1995), and if this is coupled with active engagement in life, it provides the opportunity for successful ageing (Rowe, Kahn, 1997). However, not all healthy seniors age successfully, and conversely, many of those who experience illness and disability may age successfully (Sarkisian, Hays, Mangione, 2002). According to research, more important than illness and disability may be the ability to physically and mentally adapt to the limitations of age (von Faber et al., 2001; Betlej et al., 2021), cope with disability, illness and maintain social engagement (Jang, Mortimer, Haley, Graves, 2004).

The presented study was designed to cover a nationwide sample of adult Poles aged 15 and over, which strengthens its validity with respect to population characteristics such as age, gender. The results clearly indicated the essential role of the residential environment and maintaining social ties with family and friends, close neighbours, as an element counteracting social exclusion. The presented results harmonize with previous studies according to which the most important problems of elderly people include loneliness, illness, disability, living in poverty, feeling useless (Paskaleva, Tufkova 2017). All these problems point to the possibility of social exclusion and marginalisation of older people as a collective, exemplified by their gradual elimination from active professional and social life when they cross the retirement age (Adamczyk 2017a).

Remaining in one's own place of residence as well as maintaining close contact with loved ones is one of the important elements of counteracting the situation of exclusion (Adamczyk, 2015: 3-21; Adamczyk 2017b). Psychosocial old age is a complex of multiple, interrelated social, economic, familial and cultural determinants, whose strength of influence varies both environmentally and individually (Kourkouta L., Monios A., 2015). As can be seen from the conducted analyses, despite the existence of individual differences, there is a common conviction among the respondents regarding the role of the place of residence in old age, as well as the importance of family and friendship ties in this period of life as important elements protecting against a sense of alienation, loneliness (Demers, Robichaud, Gélinas, Noreau, Desrosiers, 2008, 237-238).

The analyses conducted show that the best strategy for organising one's life in old age is the one that will rely heavily on a natural system of social support, referring to the immediate environment. It is therefore possible to propose a scheme showing an elderly person in a network of overlapping relationships. This diagram (Figure 3) distinguishes how important the different support systems and accompanying networks of relationships are for an older person
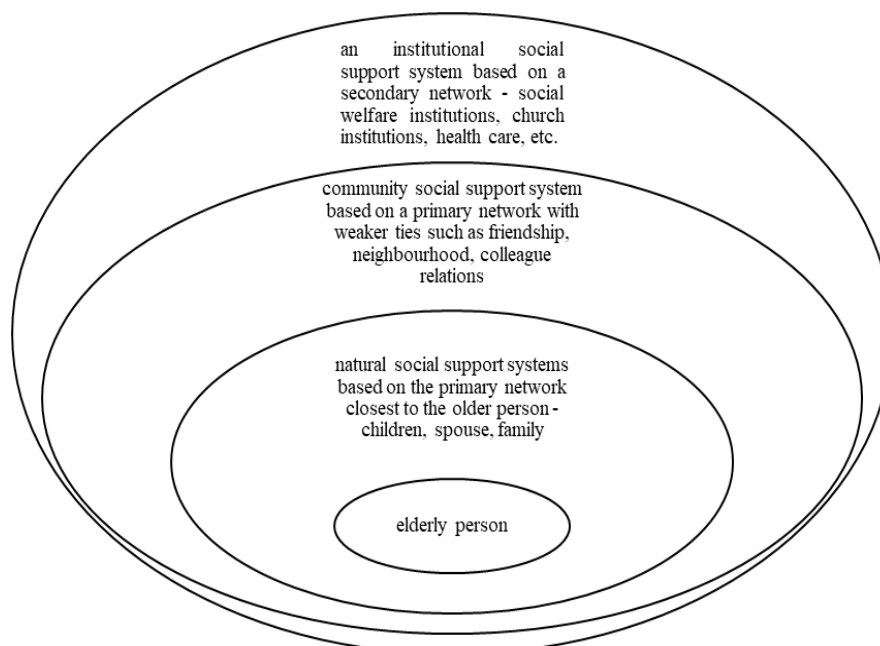
Figure 3. Diagram of the strength of relationship between an older person and their environment and the type of social support system used in strategies of organising life in old age
Source: Own study.

Very important in counteracting social exclusion of older people is anticipating future events while acknowledging the possibility of the unexpected (Fisher, Specht, 1999). Internal coping strategies minimise the effects of negative events (Smith, Borchelt, Maier, Jopp, 2002). According to the respondents, positive coping is also facilitated by having social support, mainly based on the system of natural support, which includes the closest environment, i.e. family and friends. Only then do environmental systems gain in importance in the form of self-help groups, which are built on shared experiences, or institutional systems such as social care homes.

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Monika ADAMCZYK is an associate professor of Social Sciences in the Field of Sociology. An employee of the Institute of Sociological Sciences of the John Paul II Catholic University of Lublin (Poland). Author of Books: *Social Determination of Successful Ageing and Active Preparation for Retirement* (2019), *Discovering the Dynamic Third Age* (edit.) (2016), *Oldness Between Tradition and Modernity* (edit.) (2016), *Actively Towards Retirement* (2015), *Introduction to Social Capital Theory* (2013) and many papers and expert opinions.
ORCID ID: https://orcid.org/0000-0002-1331-6026

THE TRANSITION TOWARDS TO THE CIRCULAR ECONOMY: EUROPEAN SMES' TRAJECTORIES

Alfonso Marino [1], Paolo Pariso [2]

[1,2] *Università della Campania Luigi Vanvitelli, Viale Abramo Lincoln, 5, 81100 Caserta CE, Italy*

E-mails:[1] alfonso.marino@unicampania.it; [2]paolo.pariso@unicampania.it

Abstract. The transition towards to the circular economy of European SMEs' is one of the items on the agenda in Europe. The aim of the paper is evaluate if this drive should transform our SMEs and keep European production sustainable and competitive. The paper presented a comparison analysis on the circular economy SMEs transition in the 13 sectors EU Member States. The study highlights and evaluates the transition in 13 sectors with highest SMEs performance. Five trajectories have been identified and evaluated in order to investigate, the transition degree of each sector towards to the circular economy. The analysis shows a heterogeneous transition with both sectors and Countries in which the presence of best practices, have been realized, but, can not be transfer to other sectors. A series of barriers to the transition from linear to circular economy are composed in the SMEs sectors.

Keywords: linear economy; circular economy; Europe, materials; SMEs

1. Introduction

The process of economic development and industrialization of our society, born with the industrial revolution, supported by the linear economy model. This pattern is linked to the idea of "take make dispose" by using raw materials as input and landfilling the products at the end of their life cycle (Murray et al., 2017). This model has reached points of no return, creating an imbalance between resource supply and goods demand. This imbalance extends to intangible but fundamental resources: air, water and soil. In this case, there is an imbalance between nature's regeneration rate and resource consumption rate. These are two strategic problems of the linear model (Michelini et. al., 2017). It is interesting to note that, both problems come together in the difficulty of achieving a possible sustainable development and preserve the planet for future generations (Stahel 2016). An alternative model of growth emerged in terms of the debate at, both theoretical and operative level. The big company, SMEs, Public Administration, Governments, make decisions, implement actions, classified as circular economy

outcomes. Circular Economy (CE), described an economy system aimed at eliminating waste, pollution and reducing use of resources. A strategic trajectory of this model is reported to reuse, to sharing, to repair, refurbishment, remanufacturing and recycling, in order to create a close-loop system. This close – loop system aims at minimizing the use of raw material and the creation of output with waste, pollution and carbon emissions. All imbalance factors should become new raw material and, in this logic, the circularity means a regenerative action in term of both production and nature. The circularity support also, the creation of new jobs and market opportunity. It is interesting to note that, the European Commission (EC) has adopted a Circular Economy Action Plan in which the Member States supporting in the transition towards the CE. The transition is linked both, material and immaterial flows (Kirchherr et al., 2017). Following this research stream, Hislop and Hill (2011) considered the CE as a development strategy for a sustainable pattern aimed at supported the resource efficiency in terms both, material and immaterial flows. Preston (2012) focused on the regenerative actions able to support the transition towards the CE. The authors started from different points of view, they converge on the idea that the CE is a 3R system that influences the environment, the economy and the society. At theoretical level, Kirchherr et al. (2017) focused on the analysis by comparing 114 definitions of CE. Ghisellini et al. (2016) elaborated an ample systematic literature review (SLR) on CE issues. This SLR, evaluates circular economy, at micro, meso and macro level. Korhonen et al. (2018) focused on the emergent literature related to several fields identifying different variables, perspectives and contributions. However, only a few authors focused on the operative application at macro level (Ghisellini et al., 2016) for an extended geographical area (i.e. Europe). Following this research stream, this study focuses on the obstacles towards from linear to circular economy (Hopkinson et al., 2018) and proposes a framework to identify obstacles linked to change business model (Lloret, 2016) in European SMEs (EC, 2014). The study intends to contribute to an accumulation knowledge in a strategic change of the Europe in 13 sectors where SMEs are a strategic pillar of the European economy sustainability (Geissdoerfer et al., 2017). SMEs and its environmental impact (Dey et al., 2019; Dey et al, 2020) is a pivotal theme that is being increasingly implemented in the economic development of all sectors, both industrial and services. (Katz-Gerro et al., 2019; Rizos et al., 2015). At theoretical level, (Farooque et al, 2019; Parida et al, 2019; Saavedra et al., 2018; Møller et al., 2014) circular loop related to SMEs, is the result of regenerative strategy linked to raw material use, production structure and by different use of the physical, chemical and biological characteristics of the environment. At operative level, in Europe, interesting actions, (European Commission, 2015a; 2015b; 2018; 2019a; 2019b; 2019c; 2020) have been implemented to support the transition towards the circular economy SMEs. In this context, the European Environment Agency (EEA, 2020); highlights the need to address environmental challenges of unprecedented scale and urgency. Resources are not as unlimited as Meadows et al., 1972 explained. The convergence of these both, different theoretical and operational focuses converges on: the consumption of raw materials and energy (Tvaronavičienė et al, 2018, waste production (Rosa et al 2019). These considerations are important because: the use of non-renewable raw materials and available energy sources leads to the impoverishment of the planet to the detriment of future generations;, waste degrades the environment. These issues highlight challenges and opportunities and is necessary to manage the activities of the enterprise appropriately (Genovese et al., 2017) from linear to circular economy (Türkeli et al., 2018) in order to make: a sustainable consumption (Lim, 2017) of raw materials and energy, to reduce the production of waste, to mitigate the environmental risk. What is the contribution of SMEs in Europe to boost this transition? European SMEs, produce 20% of total EU value added, 35 million jobs, Industry accounts for 80% of exports, 99% of European firms are small and medium sized businesses (EU 2020). European SMEs needs to become more circular while remaining competitive on the global stage. The Small Business Act is one of the key tools to understand the implementation of the circular economy in the SMEs sectors (Liu et al., 2018; Lieder et al., 2020). Starting from these assumptions and following the contributions of the literature in the following paragraph, our research question (RQ) is as follows: can this drive should transform our SMEs and keep European production sustainable and competitive? The paper is organized as follow: sections two outlines a conceptual background on the circular economy will be developed. Section 3 shows the methodology. Section 4 explains the results. Section 5 displays the discussion and related research limits. Finally, Section 6 shows the conclusions of the paper.

2. Theoretical background

The literature and the EU directive and recommendations indicate that most of the issues concerning the CE transition evolve around SMEs, its production, its raw material reuse and its disposal. In fact, SMEs management is considered by European Commission (2015a; 2015b; 2018; 2019a; 2019b; 2019c; 2020) in overall 28EU Member States a strategic enterprise to address the transition from linear to circular economy. Liu et al. (2017) focused on the SMEs sustainable performance under the concepts of the circular economy through "Reduce, Reuse and Recycle" (3R) rules. At theoretical and operative level, is underlined the need of an adequate support framework at investment and technologies level for the sustainable outcomes. Iacovidou et al. (2017b) highlight how sustainable results can create complex values useful in the transition towards to the circular economy. In addition, in line with the Small Business Act, the SMEs sustainability and its manage (Malinauskaite et al., 2017) is a strategic outcome in all 28 EU Member States. Minelgaitė and Liobikienė (2019) focused on the importance of 3R behaviors as effective action to the support, in the European Union, of the SMEs transition from the linear to the circular economy. In this context, should be also pay more attention to the promotion of efficient consumption and production patterns. In fact, many studies focused on the relationship between the SMEs production and socioeconomic factors (Lu et al., 2017), and consumption (Bosire et al., 2017; Han et al., 2018; Huang et al., 2020) focused on SMEs, identifying socioeconomic and consumption as dominant drivers. In fact, Elia et al. (2017), highlighted the inadequacy of single factor, to support the transition. According to Elia et al. (2017), Iacovidou et al. (2017b), pointed out that the transition is both a complex and composite phenomena. The CE is a strategic objective and therefore a single factor does not explain the transition process (Marino, et al., 2020; Mazzoni, 2020). This analysis may be strategic to comprehend how the SMEs are implementing and should implement actions to boost the transition towards the CE. This problem is addressed by EU recommendations that suggest an intensification of actions such as Roadmap, Green deal and Circular procurement implementation. It is interesting to note that the main bottleneck concerns the achievement of the national transition objectives. From the analysis of the official reports emerges great differences in the transition results achieved within 28 Member States both in terms of the economic sector, private or public, that has driven the change and in terms of extent and degree of transition in each State. Criticalities that hinder the transition have emerged in terms of national government choices and connected to specific sectors and services. The efforts made by the Member States to shift their social and economic activities towards "circularity" have fostered changes in the business model and labor market, with new business models (Pieroni et al., 2019) and new opportunities resulting from the implementation of the 3Rs actions. This idea of SMEs circular economy considers it as a transformative economy redefining production and consumption patterns, inspired by ecosystems principles and restorative by design, which increases resilience, eliminates waste, pollution and creates shared value through an enhanced circulation of material and immaterial flows. It focuses on the key drivers of the paradigm: resource efficiency, sustainable economic growth, environmental protection and social development. The main idea is that the circular economy is a 3R system (Milios, et al., 2019) with predominantly environmental, economic and social impacts. Following this research stream Kristensen et al., (2020) analyzed the emerging literature from several domains to identify concepts and take into account the complexity of the issues and perspectives of the various contributions. Furthermore, European Commission considers the topic in overall production sector as a strategic issue to address the transition from linear to circular economy (Liu et al. 2018; Benachio et al 2020; Lahane et al., 2020; Iacovidou et al. 2017b). Winkler, (2011) reinforces these concepts with three structural barriers to enhancing product reuse circularity. The first is that a large part of the used materials is accumulated as in use, and the second is that a large amount of unrecycled materials is sent to landfill. Reusing used materials as raw materials (second raw material) is another strategic cornerstone. As the rates for some materials are already high, substantial improvements still appear possible. (Iacovidou et al., 2017a; Horodytska et al., 2018; Hahladakis et al., 2019; Gelhard et al., 2016). Following this research stream, preferring 3R materials to the raw materials, it is possible to influence the performance of SMEs both in relation with their production -transformation processes, by making them less energy- intensive, more resource efficient, and market competitiveness. It is interesting to note that the 3Rs strategy is a manufacturing strategy which is also driven by market conditions (Brissaud et al., 2017). the increase SMEs in secondary raw material use will open new markets, with positive actions concerning: reduce

costs of production; increase businesses competitiveness; encourage new product development; create jobs; promote innovation (Dey et al., 2019); stimulate economic growth (EEA, 2013; 2018; 2020; EU, 2020; EASAC, 2016; Geng et al., 2012). The positive actions mentioned above provide interesting qualitative trajectories useful to interpret the degree of transition, in the different production sectors where SMEs are present, from linear to circular economy (Awasthi et al., 2018). From our research perspective, it is essential to outline the European context and analyze the trajectory of each sector in which SMEs have a strategic role. However, only a handful of authors were interested in operational application at the macro level (Ghisellini et al., 2016) for a geographical area in specific sectors (i.e. Europe), following a qualitative approach. This paper is designed to help fill this gap. The next paragraph will explain the modalities. The accumulation knowledge and application of strategic trajectories, should allow for the design of a circular economy achievement process. This analysis will be of interest to SMEs, researchers, policy makers and governmental planners, who can acquire information for the development of circular economy strategies in long-term plans.

3. Research objective and methodology

In order to investigate circular economy in 13 European sectors, (2016 – 2020) it is necessary to understand how the sectors are implementing and should implement actions, starting from linear economy, to boost the transition towards the circular economy. It should be noted that, even if there are a large number of Official reports on the EU platforms (Eurostat, 2017a; 2017b; 2018; 2019; OECD, 2016; 2017; UN 2019), the ones chosen represent for the quality of the information, a useful tool for the survey carried out. Official reports, 24, were issued. Their common denominator was to accelerate the SMEs transition of European sectors towards from linear to circular economy. We elaborated this information and devised a synoptic framework to outline the progress made so far and to identify possibilities and opportunities for improvement. The 24 official reports are related to the : external survey and reports but also contributions received from chambers of commerce and business organizations related to. Analysing the official reports has been possible to accumulate knowledge in 13 European sectors in which SMEs, are strategic pillar. The accumulation knowledge is qualitative also if based on a large document analysis and take into account the trajectories towards from linear to circular economy. This accumulation knowledge starting from three different typologies of official reports: External surveys and reports; dedicated reports, surveys and contributions from chambers of commerce and other business organizations related; internal and external databases and reports.

The first typology is related to: Eurochambres, 'Business survey – EU Internal Market: Barriers and Solutions', 2019 (Eurochambres 2019 survey); World Bank Group, 'Doing Business 2019', 2019 (World Bank Doing Business report), Centre for European Policy Studies (CEPS), 'Hidden Treasures: Mapping Europe's sources of competitive advantage in doing business', 2019 (Hidden Treasures report); The Association of German Chambers of Commerce and Industry (DIHK), 'DIHK Survey on Single Market Obstacles 2019: Services, Goods and Investments' (DIHK 2019 survey); Dutch Ministry of Economy, Dutch export agency, 'Doing Business in Europe', 2018 (Dutch Doing Business in Europe survey);Estonian Ministry of Foreign Affairs and Communications, 'Mapping: applicable regulatory requirements for a construction company on its export journey to Estonia, Finland, and Sweden', 2018; Governments of Ireland, Denmark, Finland and Czechia, and Copenhagen Economics, 'Making EU Trade in Services Work for All: Enhancing innovation and competitiveness throughout the EU economy', November 2018. The second typology is linked to: Austrian Chamber of Commerce; Croatian Chamber of Economy; Cyprus Chamber of Commerce and Industry, Czech Chamber of Commerce; Confederation of Danish Industry; Confederation of Finnish Industries; French Chamber of Commerce and Industry; Latvian Chamber of Commerce and Industry; Malta Chamber of Commerce; Spanish Chamber of Commerce; Confederation of Swedish Enterprise. The third typology is related to: European Commission, Annual report on European SMEs 2017/2018', 2018 SOLVIT database, European Commission,

European Central Bank, 'Investment Barriers 2019', European Enterprise Network, Intellectual Property SME Scoreboard 2019 Safety Gate.

In order to evaluate these Official reports, has been implemented the following qualitative method (Neuman 2014) each project has been evaluated starting from following qualitative variables: transparency, maximizes validity, maximizes reliability, comparative, reflexive. In table 1 in order to share the method have been reported the criteria and method to assess 24 SMEs official reports.

Table 1: Criteria and method to assess 24 SMEs official reports

Criteria	Method
Transparent	Provide a clear account of procedure used, an 'audit trail' that others can follow (i.e. could the evidence – fieldwork notes, interview transcripts etc - be inspected independently? Were procedures for data analysis clearly described and justified?)
Maximizes validity	Analysis of cases that do fit within the RQ. Including enough context for reader to judge interpretation
Maximizes reliability	Analyses of whole set of information. Using more than one analyst/ coder
Comparative	Compares information between and within cases in the data set. Compares findings to other studies
Reflexive	Accounts for the role of the SMEs in analyzed context i.e. take into consideration the impact that its being part of an institutional organization (in Italy i. e. may be the SMEs institutional organization) might have had on the responses given. Do you think Official reports might have exaggerated certain problems for example? The researchers dos not be swayed by favorite findings

In the next section, are identify the most important SMEs' obstacles per 13 sectors towards from linear to circular model.

4. Results

In order to answer the RQ official reports have been analysed, and 13 sectors assessed. The sectors are the ones where the concentration of SMEs in Europe is the highest.

- Architecture and engineering
- Automotive
- Chemicals
- Construction
- Electronic communications networks and services
- Energy
- Food and beverages
- Hotels and accommodation
- Industrial machinery
- Pharma
- Fashion
- Public transport
- Waste management

The concentration ratio is between the minimum value of 53%, in the food and beverage sector, to 96% of chemicals (Annual Report on European SMEs 2018/2019). The analysis of 13 sectors underlines different results in terms of the change from the linear to the circular economy.

4.1 Architecture and engineering

This sector shows, 67% of SMEs. It is a knowledge-intensive sector and can play a supporting role in the transformation from linear to circular. Architecture and engineering companies face obstacles at different stages of their service production to move from a linear to a circular economy. The circular economy, based, as seen in the conceptual background, on the principle of 3R, highlights the need for the reuse of materials, for a capacity to extract from the waste of the second raw material. This regeneration, needs to in the design phase knows the performance of the product. The use of these materials, in this phase of transition, from the linear to the circular model, highlights the need for services for companies oriented towards the dissemination and development of this knowledge. It is interesting to note, that the analysed report, highlight the practice, for the short time, of the principle of free movement of professionals applies and in most cases only allows for a prior declaration requirement by the host Member State. This principle has brought an interesting cross contamination in terms of exchange of knowledge within the sector. This exchange of knowledge is possible between EU Member States, infact, access is regulated and professional performance is possible. Examining the twenty four official reports, the challenges are linked to dissemination knowledge based on management and protection of resources. As we will see this criticality is present, although with similar characteristics, also in other sectors analysed. The obstacles, are linked to the technical and knowledge barriers. Particularly, in terms of technical barriers the most important bottleneck are linked to lack of expertise in production and use, while, in terms of knowledge the bottleneck are linked to weakness of R&D.

4.2 Automotive

This sector shows, 57% of SMEs. It is a technological-intensive sector and can play a supporting role in the transformation from linear to circular. Two main trajectories can be highlighted in this area. The first relates to the old car market, linked to the mechanical engine and connected to petrol, this car, which is highly polluting, is still in circulation in the individual Member States and the policies of the individual States, have a strong mismatch that does not in fact speed up the switch from a linear to a circular economy. The second trajectory relates to the new vehicle sector, which is currently subject to harmonised standards in the EU in the context of the EU type-approval framework (Directive 2007/46/EC and soon Regulation (EU) No.2018/858 on emissions and safety). These standards mean that all new vehicles sold in the EU are in principle subject to the same technical requirements for emissions and safety. This is a good step towards the transition to the new circular business model in all Member States. In the official report analysed, some barriers have emerged that have been pointed out by SMEs that could prevent the transition from the linear to the circular model. The first concerns financial resources availability, which is directly linked to the second, the difficulties of producing products that support climate change. These critical issues are particularly important in the case of integrated mobility services, which on the one hand can incentivize a different model of cars, for example not related to single transport and on the other, rely on different types of vehicles to be integrated into a complex system. The obstacles, are linked to the commercial and regulatory barriers. Particularly, in terms of commercial barriers the most important bottleneck are linked to the difficult to source second raw materials, while, in terms of regulatory, the bottleneck are linked to SMEs difficult to get clearance for new raw material production.

4.3 Chemicals

This sector shows the highest percentage of SMEs. EU chemical legislation deals with the complexity of chemical risks and has been instrumental in ensuring free circulation of substances, mixture and articles within the EU market. Analysing the official reports, emerging some bottlenecks related to a more circular production and use of chemicals in Europe. The reuse of raw material is a strategic tool related to boost the transition from linear to circular model in this sector. The resources assigned to this transition are still weak. It is also important underline that from national Government and at EU level, there is a lack of access to finance and other incentives related to the transition. In Europe, there are SMEs producing and using safer alternatives, e.g. use of less hazardous chemicals, but have not received appropriate funding to sustain this strategic approach. Analysing the official reports, emerging some bottlenecks related to financial resources availability but also, to save in the supply of

power. The obstacles are related to reuse material, in terms of raw material association with production cycle and misconception that linear products are better built.

4.4 Construction

This sector shows, 67% of SMEs. The sector, in order to accelerate the SMEs transition lead to one hand both regenerate and reuse materials and, the other, knowdledge actions for service providers active in the market. The transition process (Benachio et al 2020), take into account not only the traditional SMEs mission, to build, but also the innovative actions linked to technological opportunities. To build must be combined with environmental sustainability (Dey et al., 2020) and therefore, buildings were made more efficiently from the energy saving viewpoint. The integration, coordination and control, of digital technologies in construction has to be carefully implemented in terms of service delivery, e.g., to develop technologies for building data collection and processing. The sector, in terms of analysis linked to official reports, highlight the importance of, savings in the supply of power and mitigation climatic change. The obstacles, in terms of barriers that delay the transition from linear to circular economy, technical and regulatory actions are strategic to make up for the accumulated delay.

4.5 Electronic communications networks and services

The existence of high-speed consume of electronic both goods and services, if one hand determinate a development of the digital market, on the other, produce electronic wastes with a low level of reuse or regenerative actions. In this sector, but also in Construction, the lack of reuse and regeneration of materials represent sunken costs related to pollution and waste of raw materials as not only in the sector, but assess the high-speed consume, this sunk costs are related to all business model. Particularly, come back to the sector, from analysis of official reports is possible to note an attention related to wellness and economic growth. This challenge is linked to the necessity of increase the level of reuse and regeneration of materials to accelerate the transition. The obstacles related to the transition from the linear to the circular economy of SME in this sector, the main barriers are linked to 3R materials: raw material association with production cycle and misconception that linear products are better built.

4.6 Energy

This sector shows, 77% of SMEs. Energy is one of strategic economic good, energy is: an input to the production of almost every other good and service and a good output, in the modern economy. In the sector, analyzing the official reports, there are challenges linked to the transition in terms of savings in the supply of power, mitigation climatic change, wellness and economic growth. These challenges may be overcome starting from a different action of EU, in particular changing the limited role of EU legislation based on complex procedures that can create technological and organizational (Gelhard et al., 2016) changes by SMEs in terms of acceleration of the transition. In order to assess the obstacle to the transition, the main barrier is linked to a regulatory and in specific way, legislation lack by EU and government.

4.7 Food and beverages

This sector shows, 58% of SMEs. Analyzing official reports related to SMEs in food and beverage, the transition could have a positive impact in different stage of production and delivery. The main challenges are related to waste prevention, resource efficiency water and energy included (see introduction) or extension of life-cycle products, in production stage and labelling in service delivery. Furthermore, some factors such as partnerships, applied research or innovation (Dey et al., 2019) could act as key-factors at any step of the cycle. In order to support these actions, savings in the supply of power and wellness and economic growth are the strategic actions related to all SMEs ane stakeholder (ECSPR; 2018; 2019) of sector. The obstacles, are linked to SMEs' lack of knowledge and big companies' profitability as main barriers, knowledge and commercial, to the transition from the linear to the circular economy of SMEs.

4.8 Hotels and accommodation

This sector shows, 68% of SMEs. The transition in this sector could begin when the customer books a travel and accommodation, so it starts when the customer decides the preferred destination. It is possible to individuate six steps: travels; reaching his destination; uses local transports; accommodation; consumes food; finally, he travels back. All six steps are compatible with circular economy. In this sector, the active role of the consumer, his knowledge, are essential to boost the transition. The challenges are linked to savings in the supply of power, mitigation climatic change, wellness and economic growth. The obstacles in terms of main barriers are related to consumers' knowledge (knowledge), transport costs (commercial), quality certification (regulatory).

4.9 Industrial machinery

This sector shows, 57% of SMEs. In this sector, some challenges are emerging to the SMEs. The challenges are related to low ratio of reused materials to their circularity, but the strategic action, in order to boost circular loop consist in the missing product and services standards in new technologies e. g., artificial intelligence and internet of things. The delay in managing this criticality could increase the costs and information asymmetry of SMEs. This problem, which emerged from the study of the twenty-four official reports, is linked to the challenges of the financial resources availability and dissemination knowledge based on management and protection of resources. The obstacles, in terms of main barriers are related to storage, big companies' profitability and weakness of SMEs in start up (commercial). These barriers, related to the implementation of circular loop are linked also to initial capital processing plants (technical) and SMEs' lack of knowledge (knowledge) and legislation lack by EU and government (regulatory).

4.10 Pharma

This sector shows, 75% of SMEs. The sector has published a White Paper on the 'circular economy', focusing on its importance to the sector and the measures needed to move towards greater sustainability. This approach provides investments in green pharm. In the sector, the shift to a circular economy of SMEs is, also related to industrial secrecy. It is interesting to note that the circular loop could help drive the industry's innovative skills, driving the efficient use of materials and improving the business value of SMEs in the long term. Analyzing the official reports, the most important challenges are related to savings in the supply of power, dissemination knowledge based on management and protection of resources, wellness and economic growth. The obstacles, in terms of main barriers, are linked to regulatory: legislation lack by EU and governments, SMEs difficult to get clearance for new raw material production and 3R materials: associated with raw material association with production cycle.

4.11 Fashion

This sector shows, 67% of SMEs. The sector, the big companies, has implemented fast fashion, i.e. processing cycles of less than 21 days the collections are designed, manufactured and distributed (Jia et al., 2020). It is a model of programmed obsolescence that speeds up the use of circulating material but, not its reuse or regeneration. Also in this sector, fast strategy actions show little attention to sustainability and pollution in its different forms. This cycle is typical of a linear economy that does not plan to close the circuit. SMEs in the sector are implementing elements of circular economy. Starting from the design trying to contain waste as emerges from the analysis of official reports, the most important challenges are linked to: savings in the supply of power and mitigation climatic change. In order to address these challenges the principal actions are linked to: facilitate the repair of parts in order to recycle them or give them a second life; use quality materials with a timeless design to maximize their usability, make products with biodegradable or at least recyclable materials. The obstacles related to main barriers are related to technical, commercial and knowledge barriers: lack of expertise in production and use, initial capital processing plants, difficult to source second raw materials, storage, big companies' profitability and weakness of SMEs start up.

4.12 Public transport

This sector shows, 63% of SMEs. The public transport sector, in order to improve its circular loop, should achieve a twofold objective: the shift from fuel consumption - fossil fuels - to clean energy power for bus traffic and, to improve the supply sector in relation to the choice of materials by replacing the current ones, with those with a high percentage of reuse and recycling. The challenges related to these improvements are savings in the supply of power, mitigation climatic change, dissemination knowledge based on management and protection of resources, wellness and economic growth. The obstacles in terms of main barriers to the transition from the linear to the circular economy of SMEs, are linked to 3R materials, raw material association with production cycle and, technical, lack of expertise in production and use and, knowledge, SMEs' lack of knowledge, weakness of R&D.

4.13 Waste management

This sector shows, 62% of SMEs. In addition, this sector, waste management, as all previous sectors, is part of the transition towards a circular economy. The Action Plan for a Circular Economy sets up a concrete action plan that covers the whole life cycle of a product: from production and consumption to waste management and the secondary materials market. The principal challenges are linked to saving in the supply of power, mitigation climatic change, dissemination knowledge based on management and protection of resources, wellness and economic growth. The obstacles in terms of main barriers to the SMEs transition from the linear to the circular economy are related to technical (lack of expertise in production and commercial (difficult to source second raw materials and storage), knowledge (SMEs' lack of knowledge and weakness of R&D), regulatory (quality of certification) 3R materials (raw material association with production cycle). The synthesis of challenges, primary role of the SMEs in the sector and circular economy objectives are displays in table 2.

Table 2. Challenge Primary role of the SMEs and circular economy objectives

Challenges	Primary role of the SMEs	Circular Economy objectives
Savings in the supply of power	• 40% of the total energy consumption comes from his productions. • 1/3 of energy consumption in SMEs they are used for production and processing plants. • 3.3 million barrels of oil could be saved every year in Europe if the SMEs were made more efficiently from the energy viewpoint.	Supply of raw materials: • Production of manufactured products: - Energy consumption - CO2 emissions - Production waste • Transport on site
Mitigation climatic change	• 460 million tons of CO_2 could be saved every year in Europe by energy-efficient measures from an energy point of view in SMEs. • SMEs are one of primarily responsible for greenhouse gas emissions and represent 39% of the CO_2 emissions in the USA	Use of resources: • Waste produced - Energy efficiency - Use of water - CO2 emissions
Dissemination knowledge based on management and protection of resources	SMEs are responsible from 30 to 40% of solid waste creation, 30% of use of raw materials and 10% of land cultivated.	• Impact of waste from production • Sustainability in production and Transformation assessment skills in time
Wellness and economic growth	Only in the EU, 5.9 billion dollars could be saved every year in the health and economic costs to air pollution, simply improving 3R materials.	Workers' health and safety: • Disorders of the neighbourhood (noise, dust, congested traffic) • Performance in place compared to project performance Solutions for thermal and acoustic comfort: • Safety (fire protection) • Health (indoor air quality)
5. Financial resources availability	Up to 530,000 jobs could be created in Europe through a strategy ambitious aimed at improving efficiency energy in SMEs..	• End-of-life costs: recovery/ disposal • Maintenance costs • External costs: heating, conditioning, water, electricity • Purchase and production costs

Source: Our elaboration based on the analysis of twenty-four official reports

Table, sums up the results from 4.1 to 4.13. In Table 2, after the challenges have been identified, the primary roles of SMEs in relation to their current linear economy-based production cycle have been identified by the analysis of the 24 documents. In the next column, again from the analysis of the official reports, the main objectives of the transitions that must see SMEs protagonists have been identified. The main barriers to the transition have been identified in table 3.

Table 3 Main barriers to the transition from the linear to the circular economy of SMEs

Technical	Commercial	Knowledge	Regulatory	3R materials
Lack of expertise in production and use Initial capital Processing plants	Difficult to source second raw materials Storage Transport costs Big companies' profitability Weakness of SMEs in start up	SMEs' lack of knowledge Weakness of R&D Consumers' knowledge	Legislation lack by EU and government SMEs difficult to get clearance for new raw material production Quality certification.	Raw material association with production cycle Misconception that linear products are better built.

The principal barriers are five: technical, commercial; knowledge; regulatory; 3R materials and have been declined into specific points.

4.14. Technical standpoint
In the last decade, following the SMEs positive performance, have been developed second raw materials in many of sectors examined. In Construction sector hemp-concrete and various types of insulations for both internal and external wall sides, are interesting transition from linear to circular economy. These second raw materials, in all sectors analyzed, result from the combination of a design, production and transformation matrix. Within this matrix some materials plays a main role. Several studies focused on the properties of these materials, one among the most interesting is the ability to reduce $CO2$ during manufacturing, both in the transformation growing phase and in the production process, so that this materials can be considered as a base useful to develop a circular loop. It is interesting to note, despite these potentialities, that technical barriers are linked to the lack of expertise in both the production, design and transformation.

4.15 Commercial standpoint
Despite the production with linear economy modality, of the SMEs, the circular loop developing in all sectors. This trend, is the result of several factors, on one hand the increase of the demand for natural products, the growth of the people awareness about the environment sustainability, the rise of raw material and petrol costs; on the other hand, the improving of techniques, production practices and industrial equipment. In line with this assumption, SMEs production should be profitable from an economic standpoint, since it should be competitive not only with other materials, but with other production alternatives as well. Some of the barriers limiting circular loop and its development and causing potential profitability issues for the SMEs are the too long storage process before delivery and, the transportation costs, which could have a negative implication on economic and environmental feasibility.

4.16. Knowledge standpoint
Among the stakeholders, a general lack of knowledge on 3r materials exists. Usually, they ignore the potential advantages of this application. In particular, the sectors before highlighted, are not aware of the benefits of this circular loop. In fact, the difficulties to overcoming this barrier starts first of all within SMEs that could realize thanks to the increase in its use a new market, higher visibility and a knowledge slot linked to environmental and economic sustainability.

4.17 Regulatory standpoint

Orienting adequate government actions to a favourable legislation means to recognize a positive identity to use second raw materials linked both to the production, with quality certification that ensure national quality standards, and to product, affecting in that way the ISO normative. In line with this, the growing in circular loop, thanks to its features of being materials with low pollution, could be a profitable alternative.

4.18 3R materials

Despite there is not a great difference between raw material and second, the public opinion seems to be confused associating second to the idea that linear products are better built. In this case, the design competences are strongly required to improve these misconceptions. 3R materials associated with production cycle could be a first step to boost the transition from linear to circular model. In addition, environmentally friendly solution are generally associated only with reduced production costs in all sectors, belittling 3R materials that also offers others well-established benefits.

5. Discussion and limits of research

The results highlight that in terms of consumption for production, the reference to 40% of the total energy consumption comes from his productions. 1/3 of energy consumption in SMEs they are used for production and processing plants and 3.3 million barrels of oil could be saved every year in Europe if the SMEs were made more efficiently from the energy viewpoint contribute to the wealth produced. At the same time, 460 million tons of CO2 could be saved every year in Europe by energy-efficient measures from an energy point of view in SMEs. Furthermore, SMEs are one of primarily responsible for greenhouse gas emissions and represent 39% of the CO2 emissions and SMEs are responsible from 30 to 40% of solid waste creation, 30% of use of raw materials and 10% of land cultivated. At the same time, only in the EU, 5.9 billion dollars could be saved every year in the health and economic costs to air pollution, simply improving 3R materials. Furthermore, up to 530,000 jobs could be created in Europe through a strategy ambitious aimed at improving efficiency energy in SMEs useful improvements to be made for the transition from a linear to a circular economy. As evidenced by the analysis of literature in the conceptual background, SMEs are one of the fundamental pillars for the transition from linear to circular model. They emerge from the analysis of official reports, the results of the research, highlight, 5 barriers: technical, commercial; knowledge, regulatory, 3R materials, that must be quickly removed to accelerate the transition. These issues are partly present in the literature, for example those concerning the barriers knowledge and 3R material, (Benachio et al 2020) while the technical ones, linked to the lack of expertise in production and use, the initial capital processing plants are less well known and debated. At the same time, with regard to trade barriers, the points that have emerged: difficult to source second raw materials, storage, transport costs and big companies' profitability, are not much discussed in the literature, but represent variables that affect the modalities and timing of the transition. In addition, it is interesting to note that even in the presence of important legislative production by the EU, there is a regulatory gap between and within sectors among smes present in the different EU Member States (Marino et al, 2020). This legislative vacuum is evident in the request in the documents analyzed, by the stakeholders for a quality certification of products and productions coming from the use of the second raw material. The picture that emerges is that of a transition on the road, which in some sectors has interesting strengths, good practices achieved, which for the barriers described in the results, in particular those of regulation, can not be exported to other Member States of the Union. At this point of the paper the answer to the RQ is that the ambition of SMEs is to overcome the challenge of transition, but they emerge, beyond the well-known and debated knowledge and 3R materials, but there are also three other trajectories, which, while complicating the transition, provide a clearer picture of the challenges facing European SMEs.

The limitations of this work are linked to the need for an analysis of the new barriers that have emerged, in particular technical, commercial and regulatory barriers. Such research can be developed in the future.

Conclusions

The paper presented a comparison analysis on the circular economy SMEs transition in the 13 sectors EU Member States. Starting from SMEs environmental sustainability and conceptual background, the study describes the state of art of 13 sectors with highest SMEs performance. Moreover, five trajectories have been elaborated in order to investigate the transition degree of each sector towards the circular economy. The analysis shows a heterogeneous transition with sectors in which the presence of best practices, e.g., 3R materials, can not be transfer to other sectors. An interesting feature, by analyzing the sectors, is represented by the fact that some barriers to the transition from linear to circular economy are composed by sectors in which SMEs are leader. These performances are interesting also at operative level. In conclusion, it can be observed that in order to reduce the gap within the 13 EU sectors it is necessary to develop ambitious government actions to support SMEs. This necessitates a strong economic structure, a willingness of the governments in term of policies, an entrepreneurial culture on the sector able to understand the circular loop opportunities behind this change. This transition is an opportunity to enhance economic context. The circular economy is an open question, and therefore at the end of this paper is possible to approve a stance whereby the transition must be seen as under constant development and reinterpretation.

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Alfonso MARINO, professor circular economy, (Università della Campania – Luigi Vanvitelli) degree in business economics with specific competencies in sustainability and circular economy.
ORCID ID: https://orcid.org/0000-0003-1722-0539

Paolo PARISO, PhD student in business economics, (Università della Campania – Luigi Vanvitelli) degree in business economics, with specific competences in SMEs.
ORCID ID: https://orcid.org/0000-0003-1066-4102

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CRITICAL SUCCESS FACTORS THROUGHOUT THE LIFE CYCLE OF INFORMATION TECHNOLOGY START-UPS

José Santisteban [1], Jorge Inche [2], David Mauricio [3*]

[1,3] Department of Computer Science, Universidad Nacional Mayor de San Marcos, Lima 01, Perú
[2] 1551 Incubator, Universidad Nacional Mayor de San Marcos, Lima 01, Perú

E-mails:[1] jsantistebanp1@unmsm.edu.pe; [2] jinchem@unmsm.edu.pe;
[3] dmauricios@unmsm.edu.pe (Corresponding Author)*

Abstract. Information technology start-ups (ITSs) contribute towards the rapid growth of society as well as encourage innovation, create technical jobs, and support the economic and technological development of countries. Despite their importance, however, ITSs have a high failure rate worldwide, making it important to identify the factors that influence their success throughout the life cycle. Moreover, studies of this topic are scarce. This study aims to identify the factors that influence the success of an ITS throughout its development stages to mitigate the risks of failure. We review the critical success factors that affect ITSs and their life cycle stages based on the literature and consider the relationship between these factors and stages. An empirical study is carried out to test the presented hypotheses about the perceptions of 125 CEOs of ITSs in Peru using a descriptive analysis, simple and multiple correspondence analysis, and the Student's t hypothesis test. Five stages of the life cycle of an ITS are established: seed, early, growth, expansion, and exit. Of the 93 hypotheses tested to assess the influence of 27 critical success factors, 77 are supported. This study proposes an ITS life cycle composed of five stages, defines the critical success factors for each of them, and establishes their influence in all stages.

Keywords: critical success factors; life cycle; stage; IT startups; entrepreneurship

1. Introduction

Companies go through different development stages (Abou-Moghli & Al-Kasasbeh, 2012). However, not all companies are the same, nor do they operate in the same sectors; thus, they do not require the same initial capital or investment, have the same levels of indebtedness, or need the same specific knowledge (Morteza et al., 2013). Hence, the different stages through which an organisation passes during its development vary by case (Kim & Heshmati, 2010).

Information technology start-ups (ITSs), also called technology-based entrepreneurship, are emerging companies with high innovative and technological potential (Colombo & Grilli, 2010). The managers of an ITS must understand their enterprise's development stages to contribute to the decision-making process (Thanh, 2015). In addition, they must know what procedures to establish for their business to have sustained growth over time (Balboni et al., 2014). In this way, an early-stage ITS that needs to grow can implement the relevant measures and strategies to make it possible. Van Gelderen et al. (2005) find that despite the positive impact of ITSs on the economies of developing countries, they also present a high failure rate worldwide (McAdam & McAdam, 2008).

In recent decades, research has discussed the main factors that influence the overall success of an ITS, among which the studies by Joshi (2021), Al-Fraihat et al., (2020, Roy et al. (2020), Anh et al. (2012), Banda & Lussier (2015), Kim et al. (2018), and Honorine & Emmanuelle (2019) are highlighted. Furthermore, Santisteban & Mauricio (2017) identify 21 critical success factors (CSFs) in the literature. However, only a few works identify the CSFs that influence the life cycle stages of an ITS. Therefore, research aim of this study is identify the CSFs that influence the development stages of an ITS (seed, early, growth, expansion, and exit) to mitigate the risks of an ITS failing. Which is summarized in the following research question: What are the CSFs that influence the success of the development stages of an ITS?. In particular, numerically tested CSFs are identified from the literature and hypotheses about the influence of these factors are established for these five stages.

The rest of the study is divided into the following sections. Section 2 describes ITSs, their development stages, and their CSFs. In Section 3, the relationships between these CSFs and development stages are conceptualised through a model. In Section 4, the research methodology used in this study is presented. The statistical results and their discussion are presented in Sections 5 and 6, respectively. Finally, Section 7 concludes.

2. Liierature Review

Introducing ITSs
According to Díaz-Santamaría & Bulchand-Gidumal (2021) ITS are important engines for regional job creation. Gimmon & Levie (2010), an ITS is essentially agile and flexible, and it also evolves in line with the market. Similarly, Petru et al. (2019) state that an ITS is created with the expectation of high growth in the near future. Finally, Santisteban et al. (2021) define an ITS as a start-up that provides innovative IT-based products and/or services. In essence, an ITS is always searching for an action model that, once tested, can transform it into a solid and mature company (Chen et al., 2019).

Development Stages
Different phases constitute the life cycle of a start-up (Strehle et al., 2010). Wing-Ki et al. (2005) propose six stages: Preparation for start-up, where an assessment of incubation programme applicants is performed; Incubation process, where services and resources are channelled for the creation, consolidation, and acceleration of the business in the market; Incubatee performance measures, which help them understand where their start-ups are incubated and how to improve their performance; Exit policies, an experienced business incubator must be able to provide knowledge and professional experience to help the start-up advance; Parental care, not all

incubated start-ups may have gained sufficient maturity to operate their business independently, in which case an extended period of care can make them competitive; and Disconnect incubator, when incubated start-ups are ready to become an independent company to enter the competitive world.

Yoon-Jun (2010) identifies three stages: Incubation, where companies identify practical business ideas, review and evaluate the possibility of commercialisation, and produce the first products; Growing, where companies begin to produce, launch, and sell their products and/or services as a result of technological development; and Maturing, when they focus on maintaining the growth rate and developing additional products.

However, Pirolo & Presutti (2010) only identify two stages: Emergence (also called appearance), when there is normally a small team and when the prototype is started and shaped; and Early growth, when entrepreneurs typically seek the largest venture capital financing from angel investors. Similarly, Mueller et al. (2012) describe two stages: Start-up, where entrepreneurs focus their attention on the business opportunity they hope to take advantage of as well as on specific start-up activities such as the development of a prototype, organisation of a founding team, and purchase of equipment; and Growth, when there is a search for resources to finance rapid growth (e.g. the entrepreneur's focus could be on strategic alliances).

Ng et al. (2014) identify three stages: Early, when the company builds its initial business team; Growth and development, when it is affected by the management of resources; and Expansion, when human capital is the driving force for companies to scale up and the technological infrastructure helps improve the development of critical assets and innovation of products and/or services. Alternatively, in Bocken's (2015) study, four stages are identified: Seed, a stage influenced by family, friends, the entrepreneur's own capital, and government support; Young, a stage in which products and/or services are in production and the first customers appear; Growing, where sales and customers are increasing and competition intensifies; and Mature, with sales and profits tending to be stable. However, competition is still fierce and a decision on whether to expand or sell the company is needed. Almakenzi et al. (2015) describe two stages: Incubation, where the leading entrepreneur evaluates the team's commitment and validates the business model; and Post-incubation, where the evolution of the market and appearance of substitute and competitive products are evaluated. Finally, Konsek-Ciechonska (2019) also identifies two stages: Seed, when the entrepreneur initiates actions that will transform the idea into a profitable activity (characterised by teamwork, prototype development, market entry, and the search for support mechanisms such as business accelerators and incubators); and Creation, when the organisation is created, employs its first employees, and sells its products. These studies show that there is no defined standard for the life cycle stages of a start-up. Some authors consider two stages, others six stages, and some consider stages that other authors do not, such as Bocken (2015) who considers the 'young' stage that is not contemplated by Ng et al. (2014). Furthermore, there are no standard terms for the stages, with the work by Konsek-Ciechonska (2019), for example, naming the stage in which the innovative idea begins as 'seed', while Mueller et al. (2012) call it 'start-up'. Hence, it is necessary to establish a standard for the development stages of an ITS.

CSFs
For the purposes of the present investigation, CSFs can condition the success or failure of a start-up (Ko & An, 2019). A large number of researchers have attempted to identify the CSFs of a start-up. From the selected publications, 27 statistically proven CSFs were identified (see Table 1). In the literature there are several studies that attempt to define a startup and its success and it is concluded that there is no standard definition. In addition, several studies identified CSFs for TBSs. However, there is no consensus on factors influence success.

3. Relationship between the CSFs and Development Stages

CSFs
To identify the influence of the CSFs of the life cycle stages, the factors shown in Table 1, are used. The influence of these factors on the overall success of an ITS; all these factors are important because they influence the success

of ITSs and must be considered to define the strategies and/or actions aimed at accelerating the development of an ITS.

Table 1. CSFs

ID	Factor	Source
F1	Customer satisfaction	Santisteban et al. (2021)
F2	Stage financing	Santisteban et al. (2021)
F3	Support of a business incubator	Santisteban et al. (2021)
F4	Developed innovation and entrepreneurship ecosystem	Santisteban et al. (2021)
F5	Dynamic capacity	Santisteban et al. (2021)
F6	Innovative and entrepreneurial culture	Santisteban et al. (2021)
F7	Industry experience	Hyder & Lussier (2016), Rojas & Huergo (2016)
F8	Previous start-up experience	Mueller et al. (2012), Pugliese et al. (2016)
F9	Academic training	Pugliese et al. (2016), Rojas & Huergo (2016)
F10	Technology/business capabilities	Yoo et al. (2012)
F11	R&D experience	Baum & Silverman (2004)
F12	Business management experience	Arruda et al. (2013), Thiranagama & Edirisinghe (2015)
F13	Entrepreneurial leadership	Schneider et al. (2007), Wei-Wen (2009)
F14	Entrepreneurial leader's gender	Friar & Meyer (2003)
F15	Entrepreneurial leader's age	Diochon et al. (2007)
F16	Motivation	Greve & Salaff (2003), Ganotakis (2012)
F17	Government support	Arruda et al. (2013), Pugliese et al. (2016)
F18	Venture capital	Almakenzi et al. (2015), Prohorovs et al. (2018)
F19	Competing market	Song et al. (2008), Arruda et al. (2013)
F20	Organisational size	Thiranagama & Edirisinghe (2015), Rojas & Huergo (2016)
F21	Business age	Haltiwanger et al. (2012)
F22	Product and/or service innovation	Ardito et al. (2015)
F23	Location	Hormiga et al. (2011)
F24	Environmental dynamism	Timmons & Spinelli (2004)
F25	Science and technology policies	Scarborough & Zimmerer (2003)
F26	Clustering	Yoon-Jun (2010), Mueller et al. (2012)
F27	Partners	Sefiani & Bown (2013)

The selected studies show that few authors link a CSF with the life cycle stage of a start-up. Figure 1 shows that of the 27 CSFs identified in the selected studies (see Table 1), only five (F8, F10, F17, F18, F28) have been linked to a development stage.
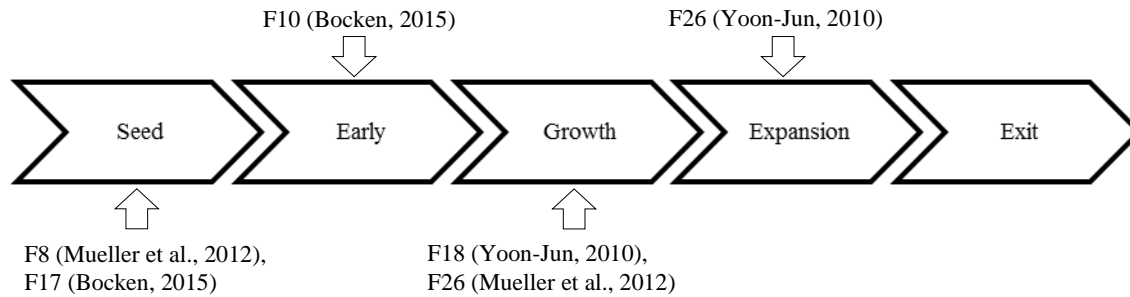
Figure 1. Development Stages and CSFs
Source: the authors

A total of 93 hypotheses linking the CSFs to each development stage of an ITS were formulated, as described below.

Development Stage 'Seed' (S1)

H1.1: The 'customer satisfaction' influences the 'success of the seed stage'.
H2.1: The 'stage financing' influences the 'success of the seed stage'.
H3.1: The 'support of a business incubator' influences the 'success of the seed stage'.
H4.1: The 'developed innovation and entrepreneurship ecosystem' influences the 'success of the seed stage'.
H5.1: The 'dynamic capacity' influences the 'success of the seed stage'.
H6.1: The 'innovative and entrepreneurial culture' influences the 'success of the seed stage'.
H7.1: The 'industry experience' influences the 'success of the seed stage'.
H8.1: The 'previous start-up experience' influences the 'success of the seed stage'.
H9.1: The 'academic training' influences the 'success of the seed stage'.
H10.1: The 'technology/business capabilities' influences the 'success of the seed stage'.
H11.1: The 'R&D experience' influences the 'success of the seed stage'.
H12.1: The 'business management experience' influences the 'success of the seed stage'.
H13.1: The 'entrepreneurial leadership' influences the 'success of the seed stage'.
H16.1: The 'motivation' influences the 'success of the seed stage'.
H17.1: The 'government support' influences the 'success of the seed stage'.
H19.1: The 'competing market' influences the 'success of the seed stage'.
H22.1: The 'product and/or service innovation' influences the 'success of the seed stage'.
H24.1: The 'environmental dynamism' influences the 'success of the seed stage'.

Development Stage 'Early' (S2)

H1.2: The 'customer satisfaction' influences the 'success of the early stage'.
H2.2: The 'stage financing' influences the 'success of the early stage'.
H3.2: The 'support of a business incubator' influences the 'success of the early stage'.
H4.2: The 'developed innovation and entrepreneurship ecosystem' influences the 'success of the early stage'.
H5.2: The 'dynamic capacity' influences the 'success of the early stage'.
H6.2: The 'innovative and entrepreneurial culture' influences the 'success of the early stage'.
H7.2: The 'industry experience' influences the 'success of the early stage'.

H8.2: The 'previous start-up experience' influences the 'success of the early stage'.
H9.2: The 'academic training' influences the 'success of the early stage'.
H10.2: The 'technology/business capabilities' influences the 'success of the early stage'.
H11.2: The 'R&D experience' influences the 'success of the early stage'.
H12.2: The 'business management experience' influences the 'success of the early stage'.
H13.2: The 'entrepreneurial leadership' influences the 'success of the early stage'.
H14.2: The 'entrepreneurial leader's gender' influences the 'success of the early stage'.
H16.2: The 'motivation' influences the 'success of the early stage'.
H17.2: The 'government support' influences the 'success of the early stage'.
H22.2: The 'product and/or service innovation' influences the 'success of the early stage'.
H23.2: The 'location' influences the 'success of the early stage'.
H25.2: The 'science and technology policies' influences the 'success of the early stage'.

Development Stage 'Growth' (S3)

H1.3: The 'customer satisfaction' influences the 'success of the growth stage'.
H2.3: The 'stage financing' influences the 'success of the growth stage'.
H3.3: The 'support of a business incubator' influences the 'success of the growth stage'.
H4.3: The 'developed innovation and entrepreneurship ecosystem' influences the 'success of the growth stage'.
H5.3: The 'dynamic capacity' influences the 'success of the growth stage'.
H6.3: The 'innovative and entrepreneurial culture' influences the 'success of the growth stage'.
H7.3: The 'industry experience' influences the 'success of the growth stage'.
H9.3: The 'academic training' influences the 'success of the growth stage'.
H10.3: The 'technology/business capabilities' influences the 'success of the growth stage'.
H11.3: The 'R&D experience' influences the 'success of the growth stage'.
H12.3: The 'business management experience' influences the 'success of the growth stage'.
H15.3: The 'entrepreneurial leader's age' influences the 'success of the growth stage'.
H16.3: The 'motivation' influences the 'success of the growth stage'.
H17.3: The 'government support' influences the 'success of the growth stage'.
H18.3: The 'venture capital' influences the 'success of the growth stage'.
H19.3: The 'competing market' influences the 'success of the growth stage'.
H21.3: The 'business age' influences the 'success of the growth stage'.
H22.3: The 'product and/or service innovation' influences the 'success of the growth stage'.
H23.3: The 'location' influences the 'success of the growth stage'.
H24.3: The 'environmental dynamism' influences the 'success of the growth stage'.
H25.3: The 'science and technology policies' influences the 'success of the growth stage'.
H26.3: The 'clustering' influences the 'success of the growth stage'.
H27.3: The 'partners' influences the 'success of the growth stage'.

Development Stage 'Expansion' (S4)

H1.4: The 'customer satisfaction' influences the 'success of the expansion stage'.
H2.4: The 'stage financing' influences the 'success of the expansion stage'.
H4.4: The 'developed innovation and entrepreneurship ecosystem' influences the 'success of the expansion stage'.
H5.4: The 'dynamic capacity' influences the 'success of the expansion stage'.
H6.4: The 'innovative and entrepreneurial culture' influences the 'success of the expansion stage'.

H7.4: The 'industry experience' influences the 'success of the expansion stage'.
H9.4: The 'academic training' influences the 'success of the expansion stage'.
H10.4: The 'technology/business capabilities' influences the 'success of the expansion stage'.
H11.4: The 'R&D experience' influences the 'success of the expansion stage'.
H12.4: The 'business management experience' influences the 'success of the expansion stage'.
H15.4: The 'entrepreneurial leader's age' influences the 'success of the expansion stage'.
H17.4: The 'government support' influences the 'success of the expansion stage'.
H18.4: The 'venture capital' influences the 'success of the expansion stage'.
H19.4: The 'competing market' influences the 'success of the expansion stage'.
H20.4: The 'organisational size' influences the 'success of the expansion stage'.
H21.4: The 'business age' influences the 'success of the expansion stage'.
H22.4: The 'product and/or service innovation' influences the 'success of the expansion stage'.
H23.4: The 'location' influences the 'success of the expansion stage'.
H24.4: The 'environmental dynamism' influences the 'success of the expansion stage'.
H25.4: The 'science and technology policies' influences the 'success of the expansion stage'.
H26.4: The 'clustering' influences the 'success of the expansion stage'.
H27.4: The 'partners' influences the 'success of the expansion stage'.

Development Stage 'Exit' (S5)

H1.5: The 'customer satisfaction' influences the 'success of the exit stage'.
H4.5: The 'developed innovation and entrepreneurship ecosystem' influences the 'success of the exit stage'.
H5.5: The 'dynamic capacity' influences the 'success of the exit stage'.
H12.5: The 'business management experience' influences the 'success of the exit stage'.
H18.5: The 'venture capital' influences the 'success of the exit stage'.
H20.5: The 'organisational size' influences the 'success of the exit stage'.
H21.5: The 'business age' influences the 'success of the exit stage'.
H22.5: The 'product innovation' influences the 'success of the exit stage'.
H23.5: The 'location' influences the 'success of the exit stage'.
H26.5: The 'clustering' influences the 'success of the exit stage'.
H27.5: The 'partners' influences the 'success of the exit stage'.

Figure 2 conceptualises the relationships between the 27 CSFs and five life cycle stages of an ITS, through its 93 hypotheses.

Factors

Development stages

F1: Customer satisfaction
F2: Stage financing
F3: Support of a business incubator
F4: Developed innovation ecosystem
F5: Dynamic capacity
F6: Innovative and entrepreneurial culture
F7: Industry experience
F8: Previous startup experience
F9: Academic training
F10: Technology/business capabilities
F11: Research and Development experience
F12: Business management experience
F13: Entrepreneurial leadership
F14: Entrepreneurial leader's gender
F15: Entrepreneurial leader's age
F16: Motivation
F17: Government support
F18: Venture capital
F19: Mercado competidor
F20: Organisational size
F21: Business age
F22: Product innovation
F23: Location
F24: Environment dynamism
F25: Science and technology policies
F26: Clustering
F27: Partners

S1: Seed
S2: Early
S3: Growth
S4: Expansion
S5: Exit

Legend:
Relationships proven in other studies
Proposed relationships

93 Hypothesis

Figure 2. Conceptual Model

4. Methodology

The sample was selected by (i) reviewing ITSs in Peru financed by the National Program of Innovation for Competitiveness and Productivity (Innóvate Perú), (ii) sending an online survey to the CEOs of ITSs, and (iii) applying snowball sampling (Chirino et al., 2016), asking each CEO who receives the survey to forward it to another ITS executive. An online survey was developed with Google Forms (Survey Google Form, 2018) based on the proposed model. The survey was carried out from May 2018 to July 2019 with the CEOs of the six generations of ITSs sponsored with non-reimbursable funds from Innóvate Perú.

Once the survey was prepared, a pilot test was conducted to validate the questions. This pilot test was carried out on 15 CEOs of ITSs in Peru, who verified whether the questions were adequately related to the hypotheses. Based on this, the wording of the questions was corrected and the use of appropriate language was reviewed.

A total of 130 responses were obtained, of which five were discarded because they presented incomplete and inconsistent responses; thus, 125 valid surveys were collected.

To determine the reliability of the measurement instrument, the Cronbach's alpha method was used. According to Streiner (2003), the closer the alpha value is to 1, the greater is the internal consistency of the analysed elements; the validity of an instrument is acceptable if it has a value above 0.70.

5. Results

According to the results obtained with the R tool, a Cronbach's alpha of 0.91 was obtained, as shown in Figure 3.

```
Reliability analysis
 raw_alpha std.alpha G6(smc) average_r S/N    ase mean   sd median_r
      0.91       0.9       1     0.051 9.3 0.0098  3.6 0.15    0.021
```

Figure 3. Results with 'R Studio' on the Reliability of the Survey Data

Descriptive analysis
Figure 4 presents the boxplots created from the responses of the surveyed entrepreneurs. As shown in Figure 4(a), the influence of customer satisfaction (F1) on S1, S2, S3, S4, and S5 has a median value of 5 (very high). The black line represents those values almost entirely around a degree of influence, and hence its box shape is flat. In addition, some outliers are observed in the influence levels of S2, S3, and S5.
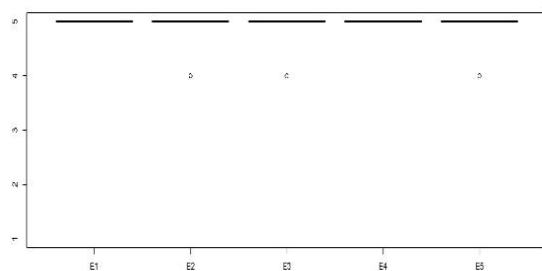
(a) F1 ➔ S1, S2, S3, S4, S5   (b) F2 ➔ S1, S2, S3, S4

(c) F3 ➔ S1, S2, S3

(d) F4 ➔ S1, S2, S3, S4, S5

(e) F5 ➔ S1, S2, S3, S4, 55
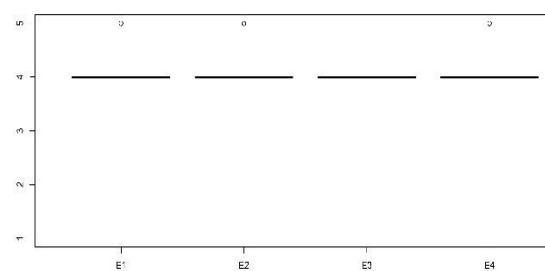
(f) F6 ➔ S1, S2, S3, S4
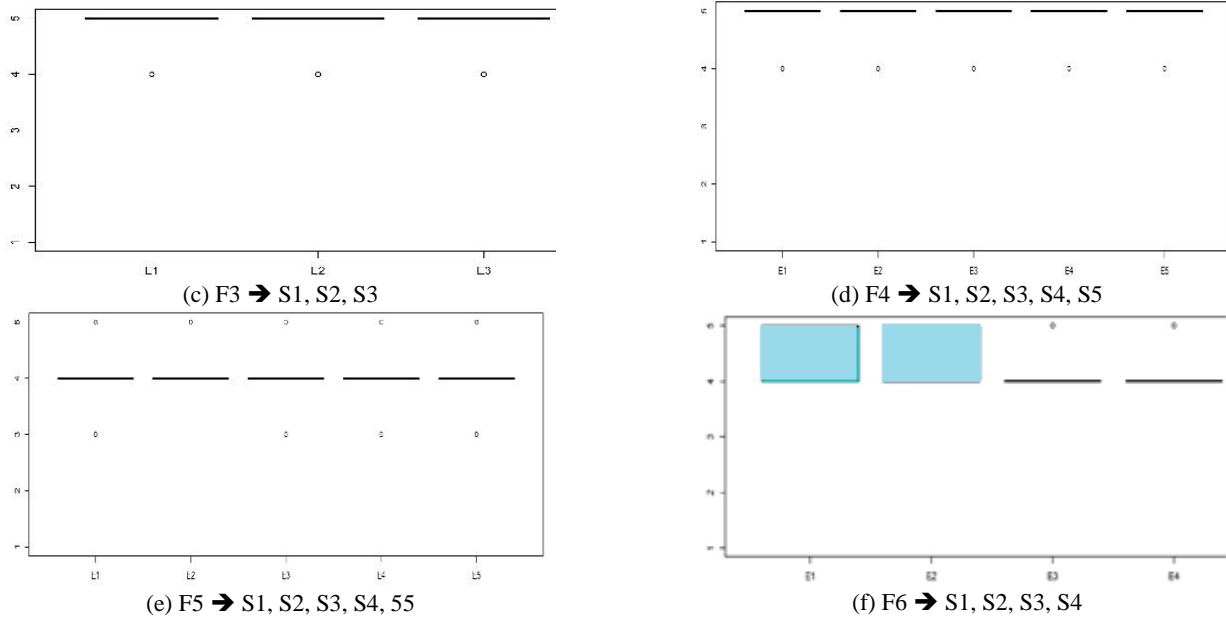
Figure 4. Boxplots Between the Factors and Stages

SCA

SCA is used to determine the level at which a CSF is related to a life cycle stage (Factor → Stage). Table 2 presents the eigenvalues for the SCA between the factors and stages, showing that the first two components explain 97.2% of the data in the sample (87.5% + 9.7%). Therefore, components 1 and 2 (Dim1 and Dim2) were used and inertia tables were constructed with these values, as shown in Tables 3 and 4.

Table 2. Eigenvalues for the SCA Between the Factors and Stages

Component	1	2	3	4
Value	0.277	0.031	0.006	0.003
Percentage	87.50%	9.7%	1.8%	1.0%

In Tables 3 and 4, the rows show the factors and the columns show the stages. Table 3 shows the contribution of each factor to Dim1 and Dim2 as well as which component each factor is most related to, the total frequency of each point (Mass), the value of the Chi-square distribution (ChiDist), and the inertia value (inertia). Similarly, Table 4 shows the contribution of each stage to each component and which component is most related to each stage.

Table 3. Factor Inertia Table

Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9
Mass	0.1127	0.0009	0.0780	0.1048	0.0024	0.0265	0.0794	0.0248	0.0007
ChiDist	0.1566	0.6103	0.4141	0.2210	0.6101	0.7304	0.2388	1.1231	1.1557
Inertia	0.0028	0.0003	0.0134	0.0051	0.0009	0.0141	0.0045	0.0313	0.0010
Dim. 1	-0.178	0.4864	0.6034	-0.345	0.9656	1.3690	0.2690	2.0760	-1.014
Dim. 2	0.6864	2.6262	-1.496	0.6952	0.8970	-0.137	-0.916	1.0797	5.6019
Factor	F10	F11	F12	F13	F14	F15	F16	F17	F18
Mass	0.0283	0.0510	0.0617	0.0548	0.0002	0.0002	0.0416	0.0184	0.0672
ChiDist	0.4075	0.5193	0.1608	0.6402	1.8638	1.8638	1.0069	0.4435	0.9055
Inertia	0.0047	0.0137	0.0016	0.0225	0.0006	0.0006	0.0422	0.0036	0.0551
Dim. 1	0.3412	0.8624	0.2689	1.1890	-1.102	-1.102	1.8763	0.7720	-1.703
Dim. 2	-1.665	-1.230	0.3204	0.7568	-7.366	-7.366	0.9238	-0.845	0.6518
Factor	F19	F20	F21	F22	F23	F24	F25	F26	F27
Mass	0.0002	0.0003	0.0002	0.1132	0.0248	0.0002	0.0097	0.0438	0.0542
ChiDist	1.8638	1.4220	2.4445	0.1656	0.9012	1.8638	0.1853	0.8915	0.8358
Inertia	0.0006	0.0007	0.0011	0.0031	0.0202	0.0006	0.0003	0.0348	0.0379
Dim. 1	-2.287	-2.036	-2.287	-0.187	-1.696	-2.287	0.1768	-1.510	-1.583
Dim. 2	-7.366	4.509	11.348	0.7299	-0.275	-7.366	-0.801	-2.142	0.2599

Table 4. Stage Inertia Table

Stage	S1	S2	S3	S4	S5
Mass	0.22973	0.20782	0.22352	0.19558	0.14335
ChiDist	0.64810	0.53845	0.38612	0.51093	0.72418
Inertia	0.09650	0.06025	0.03332	0.05106	0.07518
Dim. 1	1.21231	0.99792	-0.57989	-0.93955	-1.20342
Dim. 2	0.35741	0.00543	-1.28987	-0.40809	-1.98736

From the data in Tables 3 and 4, Figure 5 was constructed to explain how the components are related to the stages and CSFs. This two-dimensional graph visualises which factors (blue points) are most related to the stages (red triangles); in other words, the closer the CSFs are to a stage, the more these are related.
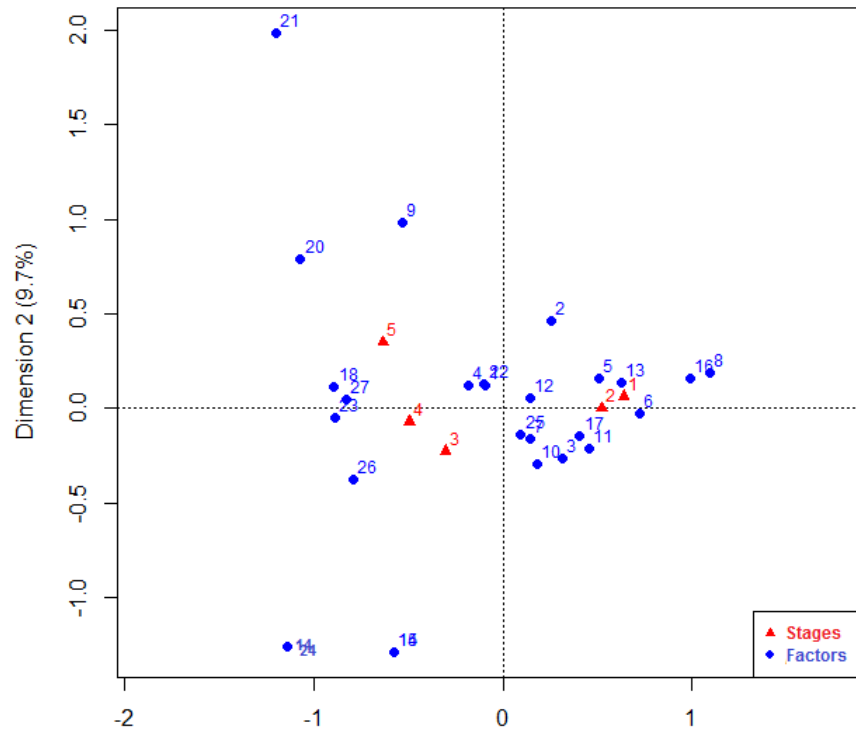
Figure 5. SCA Between the Factors and Stages

In Figure 5, the following simple relationships are observed for each factor. This technique describes the first relationships between the stages and CSFs; however, to determine the degree of influence of the factors on the stages, an MCA was carried out. MCA can determine the degree of influence between a CSF with more than one stage (Factor → Stage) (Johnson & Wichern, 2007).

MCA

MCA relationship for customer satisfaction (F1→ S1, S2, S3, S4, S5)

Figure 6 shows the distribution of the ratings provided by the entrepreneurs surveyed on the perception of the relationship between customer satisfaction (F1) and all the stages (S1–S5). This graph demonstrates that F1 has a very high influence on all the stages and a high influence on S5 (see also Table 5).
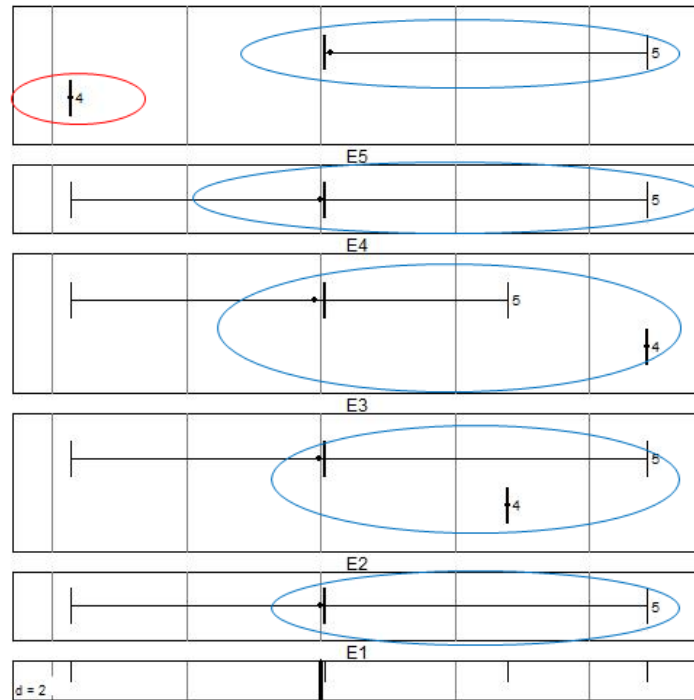
Figure 6. Distribution of the Relationship Rating (F1 → S1, S2, S3, S4, S5)

Table 5. Respondents' Perception of the Level of Influence (F1 → S1, S2, S3, S4, S5)

Hypothesis	Score				
	1	2	3	4	5
H1.1	0.00	0.00	0.00	0.00	1.00
H1.2	0.00	0.00	0.00	0.01	0.99
H1.3	0.00	0.00	0.00	0.02	0.98
H1.4	0.00	0.00	0.00	0.00	1.00
H1.5	0.00	0.00	0.00	0.04	0.96

In addition, Figure 7 shows the high and very high levels of influence of customer satisfaction (F1) for each of the stages are associated (top left). Respondents indicate that F1 influences the stages (bottom left); finally, the experience time and level that influences F1 are strongly associated (bottom right).
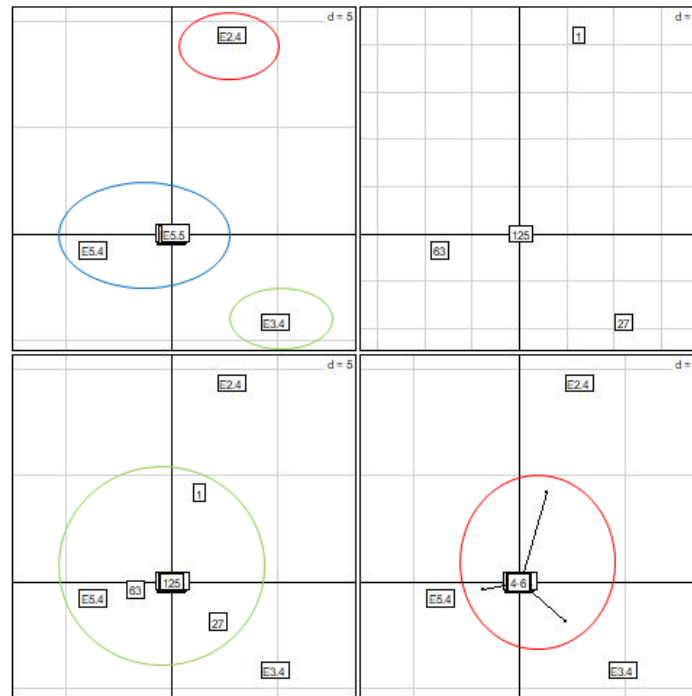
Figure 7. MCA Factor Map (F1 → S1, S2, S3, S4, S5)

Hypothesis testing

In this section, the Student's *t* distribution (Streiner, 2003) is applied to verify the hypotheses proposed in Section 3. To this end, the null hypothesis *(H₀)* and alternative hypothesis *(Hₐ)* are first formulated. *Hₐ* is accepted if *H₀* is rejected and vice versa. *H₀* and *Hₐ* are defined with the following decision rules:

- $H_0 = \mu <= 3.7$ (the entrepreneurs surveyed believe that the degree of influence between a factor and a stage is less than or equal to 3.7).
- $H_a = \mu > 3.7$ (the entrepreneurs surveyed believe that the degree of influence between a factor and a stage is greater than 3.7).

To accept or reject *H₀*, the p-value is calculated using equation (1) proposed by Monroy and Rivera (2012). The significance level value (α) for this study is 0.05. If the p-value is greater than the significance level (α), *H₀* is accepted and *Hₐ* is rejected. If the p-value is lower than the significance level (α), *H₀* is rejected and *Hₐ* is accepted:

$$t = (\bar{X} - \mu) / (s / \sqrt{n}) \qquad (1)$$

Where $\bar{X}$ is the sample mean, μ is the mean specified in the null hypothesis to be analysed, s is the standard deviation of the sample, and n is the sample size.

Table 6 shows the results of the Student's *t* hypothesis test carried out on the 93 hypotheses according to equation (1).

Table 6. Summary of the Student's t Hypothesis Testing

#	Hypothesis	t	df	p-value	Confidence interval (%)	Estimated mean Min	Estimated mean Max	Result
1	H1.1	161.500	124	2.543E-15	95	5.00630	5.00783	Supported
2	H1.2	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
3	H1.3	113.951	124	1.144E-13	95	4.96170	5.00630	Supported
4	H1.4	161.500	124	2.543E-15	95	5.00630	5.00783	Supported
5	H1.5	71.601	124	4.983E-10	95	4.92517	4.99483	Supported
6	H2.1	28.044	124	7.986E-56	95	3.99370	4.03830	Supported
7	H2.2	38.500	124	4.001E-71	95	3.99217	4.02383	Supported
8	H2.3	13.769	124	4.765E-27	95	3.92948	4.00652	Supported
9	H2.4	38.500	124	4.001E-71	95	3.99217	4.02383	Supported
10	H3.1	80.226	124	5.016E-11	95	4.93672	4.99928	Supported
11	H3.2	113.951	124	1.144E-13	95	4.96170	5.00630	Supported
12	H3.3	41.948	124	2.042E-75	95	4.83195	4.94406	Supported
13	H4.1	32.827	124	2-316E-63	95	4.75631	4.89169	Supported
14	H4.2	33.716	124	1.342E-64	95	4.76555	4.89845	Supported
15	H4.3	92.839	124	9.231E-12	95	4.94880	5.00320	Supported
16	H4.4	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
17	H4.5	80.226	124	5.016E-11	95	4.93672	4.99928	Supported
18	H5.1	14.732	124	2.561E-29	95	3.98740	4.07661	Supported
19	H5.2	23.574	124	6.085E-48	95	3.99680	4.05120	Supported
20	H5.3	26.410	124	4.728E-53	95	3.97752	4.02248	Supported
21	H5.4	18.675	124	3.830E-38	95	3.96820	4.03180	Supported
22	H5.5	13.769	124	4.765E-27	95	3.92948	4.00652	Supported
23	H6.1	18.667	124	3.979E-38	95	4.44736	4.62464	Supported
24	H6.2	15.424	124	6.334E-31	95	4.28228	4.45372	Supported
25	H6.3	13.919	124	2-105E-27	95	4.10831	4.24369	Supported
26	H6.4	16.561	124	1.638E-33	95	4.02050	4.10750	Supported
27	H7.1	30.623	124	5.736E-60	95	4.72890	4.87110	Supported
28	H7.2	56.234	124	2.079E-90	95	4.89250	4.97950	Supported
29	H7.3	31.325	124	4.741E-61	95	4.73799	4.87801	Supported
30	H7.4	18.543	124	7.323E-38	95	4.54681	4.74919	Supported
31	H8.1	8.895	124	2.918E-15	95	4.24423	4.55577	Supported
32	H8.2	6.792	124	2.048E-10	95	4.03729	4.31471	Supported
33	H9.1	-6.407	124	1.000E+00	95	3.31780	3.49820	Not supported
34	H9.2	-22.831	124	1.000E+00	95	3.04364	3.14836	Not supported
35	H9.3	-21.741	124	1.000E+00	95	3.04974	3.15826	Not supported
36	H9.4	-21.966	124	1.000E+00	95	3.03285	3.14315	Not supported
37	H10.1	15.911	124	4.845E-32	95	4.31292	4.48708	Supported
38	H10.2	13.937	124	1.901E-27	95	4.13586	4.28014	Supported
39	H10.3	15.424	124	6.334E-31	95	4.28228	4.45372	Supported
40	H10.4	14.035	124	1.119E-27	95	4.15697	4.30703	Supported
41	H11.1	25.297	124	4.305E-51	95	4.64019	4.79981	Supported
42	H11.2	24.491	124	1-225E-49	95	4.62286	4.78514	Supported
43	H11.3	19.739	124	2.211E-40	95	4.48816	4.66384	Supported
44	H11.4	13.910	124	2.209E-27	95	4.12199	4.26201	Supported
45	H12.1	24.491	124	1.225E-49	95	4.62286	4.78514	Supported
46	H12.2	23.394	124	1.320E-47	95	4.59709	4.76291	Supported
47	H12.3	18.469	124	1-053E-37	95	4.43927	4.61673	Supported
49	H12.4	16.176	124	1.211E-32	95	4.32839	4.50361	Supported
49	H12.5	5.187	124	4.229E-07	95	3.93499	4.22501	Supported
50	H13.1	161.500	124	2.543E-15	95	5.00630	5.00783	Supported
51	H13.2	31.325	124	4.741E-61	95	4.73799	4.87801	Supported
52	H14.2	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
53	H15.3	-31.511	124	1.000E+00	95	2.99854	3.08146	Not supported
54	H15.4	-5.270	124	1.000E+00	95	3.37536	3.55264	Not supported
55	H16.1	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
56	H16.2	24.491	124	1.225E-49	95	4.62286	4.78514	Supported

57	H16.3	17.242	124	4.972E-35	95	4.01513	4.09687	Supported
58	H17.1	-0.473	124	6.814E-01	95	3.51327	3.81473	Supported
59	H17.2	-0.673	124	7.489E-01	95	3.49509	3.80091	Supported
60	H17.3	-0.291	124	6.142E-01	95	3.54398	3.81602	Supported
61	H17.4	-3.072	124	9.987E-01	95	3.40404	3.63596	Supported
62	H18.3	30.620	124	5.800E-60	95	4.81869	4.97331	Supported
63	H18.4	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
64	H18.5	113.951	124	1.144E-13	95	4.96170	5.00630	Supported
65	H19.1	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
66	H19.3	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
67	H19.4	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
68	H20.4	2.654	124	4.494E-03	95	3.72543	3.87457	Supported
69	H20.5	4.655	124	4.099E-06	95	3.78967	3.92233	Supported
70	H21.3	-49.184	124	1.000E+00	95	2.99680	3.05120	Not supported
71	H21.4	-4.723	124	1.000E+00	95	3.39915	3.57685	Not supported
72	H21.5	-4.405	124	1.000E+00	95	3.40433	3.58767	Not supported
73	H22.1	161.500	124	2.543E-15	95	5.00630	5.00783	Supported
74	H22.2	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
75	H22.3	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
76	H22.4	161.500	124	2.543E-15	95	4.97617	5.00783	Supported
77	H22.5	113.951	124	1.144E-13	95	4.96170	5.00630	Supported
78	H23.2	13.769	124	4.765E-27	95	3.92948	4.00652	Supported
79	H23.3	15.311	124	1.154E-30	95	4.27468	4.44532	Supported
80	H23.4	16.455	124	2.831E-33	95	4.34395	4.52005	Supported
81	H23.5	9.691	124	3.549E-17	95	4.10425	4.31175	Supported
82	H24.1	-20.762	124	1.000E+00	95	3.05595	3.16806	Not supported
83	H24.3	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
84	H24.4	-86.500	124	1.000E+00	95	2.99217	3.00385	Not supported
85	H25.2	14.737	124	2.487E-29	95	4.04974	4.15826	Supported
86	H25.3	14.548	124	6.917E-29	95	4.05595	4.16806	Supported
87	H25.4	16.026	124	2.660E-32	95	4.02606	4.11795	Supported
88	H26.3	17.602	124	7.991E-36	95	4.57691	4.79910	Supported
89	H26.4	20.321	124	1.402E-41	95	4.63509	4.83691	Supported
90	H26.5	13.448	124	2.773E-26	95	4.20146	4.37454	Supported
91	H27.3	18.420	124	1.343E-37	95	4.59612	4.81188	Supported
92	H27.4	20.845	124	1.212E-42	95	4.63763	4.83437	Supported
93	H27.5	22.803	124	1.742E-46	95	4.61685	4.79115	Supported

As shown in Table 6, in most cases (77 relationships), the p-value is less than 0.05 and H_a is accepted. Thus, the average perception of surveyed entrepreneurs is that the CSFs have a high influence on the life cycle stages of an ITS. Moreover, 16 hypotheses are not supported (p>0.05).

6. Discussion and future research

The results of the descriptive analysis indicate high and very high relationships between the various CSFs and stages (factor → stage). For instance, the 'developed innovation and entrepreneurship ecosystem' (F4) factor is essential for the success of an ITS in all stages, as shown in Figure 4(d).

The SCA results provide evidence of the high and very high relationships between the various factors and development stages, explaining 97.2% of the sample data. The MCA results show that several CSFs have high and very high relationships with the stages, with an average of 98% of the responses. One of the strongest relationships is between customer satisfaction and it's the stages (100%).

Finally, the results obtained in the Student's t hypothesis test confirm that 77 of the 93 hypotheses are supported. H9.1, H9.2, H9.3, and H9.4 were not supported, perhaps because most technological ventures in Peru are not sophisticated (i.e. they do not require specialists). In addition, 68% of respondents indicate that they have not completed higher education and consider previous experience in managing and starting a business to be more important than academic training despite studies showing a positive relationship between the academic training of the entrepreneurial team and success of a start-up (Bou-Wen et al., 2006; Baptista et al., 2007). H14.2 was not supported, perhaps because the entrepreneurial leader's gender may be affected by another variable such as his/her experience, which according to Anh et al. (2012) & Arruda et al. (2013) influences ITS success. In addition, 94% of those surveyed have started a business before, and consider that experience to be the most influential on success, even more than gender.

Age could affect the growth and expansion of an ITS because an older entrepreneur generally has greater security and responsibility; however, H15.3 and H15.4 were not supported because the entrepreneurial leader's age (F15) presents a medium influence on the growth (S3) and expansion (S4) stages. This could be explained by the fact that age, similar to the entrepreneurial leader's gender, is also affected by his/her experience. This result disputes that of Oakey (2003), who finds that age has an influence. H19.1, H19.3 and H19.4 were not supported; this could be due to the nature of the Peruvian market. An ITS in Peru is generally characterised by the previous acquired experience of its collaborators, some innovation, and little research. Moreover, the market is not competitive contrary to ITSs in developed countries. Pugliese et al. (2016) point out that the pressure exerted by competition is decisive for the success of a start-up and that this pressure also provides ITSs with a means to improve their products through advanced research, innovation, and technological progress.

H21.3, H21.4 and H21.5 were not supported, perhaps because of the unawareness of respondents given that no Peruvian ITS has been listed on the stock market (S5), which requires companies to have been operating for a certain number of years and to have expanded to other markets (S4); further, few are in the growth stage (S3). Finally, H24.1, H24.3 and H24.4 were not supported; this could be explained by the Peruvian environment not advancing at the speed of technological ventures. According to Timmons & Spinelli (2004), environmental dynamism means having a high rate of change in the external environment of the company. Unfortunately, in the Peruvian case, several actors of the innovation and entrepreneurship ecosystem have not yet managed to support the development of ITSs.

Conclusions

In this study, 93 relationships between the CSFs and life cycle stages of an ITS were identified through a conceptual model.

There is no defined standard for the life cycle stages of an ITS. Some authors consider three stages, whereas others adopt four; some consider stages that other authors do not and others use different names for the stages. For this reason, a life cycle consisting of five stages was proposed: seed, early, growth, expansion and exit. All these stages are important since achieving success in each one of them contributes towards the overall success of the ITS. Most studies of the factors that influence the success of an ITS do not indicate which development stage is particularly affected; hence, in this study, 15 factors that influence the seed stage (S1), 17 factors that influence the early stage (S2), 18 factors that influence the growth stage (S3), 17 factors that influence the expansion stage (S5), and 10 factors that influence the exit stage (S5) were identified.

From an academic point of view, this research contributes to the literature of technological entrepreneurship proposes an ITS life cycle composed of five stages, develop an integrated model of the critical success factors for each of them, and establishes their influence in all stages by that influence the success.

The results of our analysis with 125 ITSs in Peru showed that several CSFs have high and very high relationships with the stages. Furthermore, the Student's t hypothesis test confirmed, with 95% confidence, that 77 relationships of the 93 hypotheses are supported. Hence, the final conceptual model is constituted by 21 factors and 77 relationships.

F9, F14, F15, F19, F21, and F24 that are important factors in developed countries are not valid for Peru, and probably for developing countries in the current context, although this is set to change in the medium or long term because of the development of policies to promote ITSs and acceleration of technology globalisation. F14 and F15 on success, proven in various studies, are not supported in the Peruvian case, perhaps because their effect is linked to another variable such as experience, regardless of the country of study.

This empirical study was limited to Peruvian ITSs; hence, to expand the experiment, the study could be conducted in other countries of the region. Future work could also aim to identify the requirements and activities to be performed within each life cycle stage of an ITS to move from one stage to another, considering the factors analysed in this study.

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José SANTISTEBAN is a System Engineer, he received his Magister in Systems Engineering and currently is a doctoral candidate at the Faculty of System Engineering and Informatics, Universidad Nacional Mayor de San Marcos (UNMSM), Peru. He has more than 10 years of experience in implementing information systems in different business sectors. Research interests: artificial intelligence, entrepreneurship and regional development; innovation and small firms; small firm internationalization; sustainability.
ORCID ID: orcid.org/0000-0003-4526-642X

Jorge INCHE is a Doctor In Administrative Sciences, at the Universidad Nacional Mayor de San Marcos (UNMSM) (2005-2007), with a specialization in research and development at the Karlsruhe Institute of Technology (1990-1992) in Germany. Since 1996 he is Professor at the UNMSM. His areas of interest are: innovation, environment, security and technological management.
ORCID ID: orcid.org/0000-0002-5887-8591

David MAURICIO is is a Doctor of Science in Systems Engineering and Computer Science and Master of Science in Applied Mathematics by the Federal University of Rio de Janeiro, Brazil. He had taught at the State University of North Fluminense Brazil in the years 1994 to 1998; and since 1998, he is a Professor at the Universidad Nacional Mayor de San Marcos (UNMSM). His areas of interest area: Mathematical programming, Artificial intelligence, Software engineering and Entrepreneurship.
ORCID ID: orcid.org/0000-0001-9262-626X

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MARKETING AND BRANDING STRATEGY FOR THE SOUTH BALTIC SEA REGION: REINFORCING REGIONAL INNOVATION IN SMES THROUGH CROSS-BORDER COLLABORATION MODELS IN THE AGE OF TRANSFORMATION[*]

Laima Gerlitz [1], Christopher Meyer [2], Gunnar Prause [3]

[1,2,3] *University of Applied Sciences Wismar: Technology, Business and Design, Philipp-Müller-Str. 14, 23966 Wismar, Germany*
[2,3] *Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia*

E-mails: [1] laima.gerlitz@hs-wismar.de; [2] christopher.meyer@hs-wismar.de; [3] gunnar.prause@hs-wismar.de

Abstract. South Baltic Sea Region (SBSR) is one of the EU cross-border regions that due to the patchy development patterns qualifies for EU financial support reinforcing innovation capacity and promoting collaborative and competitive mindset. Historically shaped by international collaboration patterns across the Baltic Sea, the SBSR turns into maritime or blue EU region. Being an integral part of the Baltic Sea Region (BSR) that has developed as role model for sustainable, green and smart region in the recent years, SBSR experiences increasing pace of change and the urge for sustainable transition. This creates a real conundrum for appropriate regional action. In this light, in the frame of the "InterMarE South Baltic" – a part-financed EU INTERREG project the researchers set out to contribute to situational improvement by developing tailor-made cooperative and region-wide Marketing and Banding Strategy for regional SMEs of all Blue Economy sectors. A

joint macro-regional positioning strategy for the SBSR is highly missing and available strategic attempts can be traced back to joint marketing measures in the tourism sector only. Therefore, building on eclectic empirical data covering more than 130 surveyed SMEs from all participating countries – Denmark, Germany, Lithuania, Poland and Sweden, supported by expert interviews with representatives of Blue Economy sectors in the SBSR and BSR, direct observations and field research done in the frame of study visits outside the region, this treatise presents an innovative, integrative and topical cooperative model for joint cross-border marketing and branding of SMEs operating in the SBSR in all applicable Blue Economy sectors.

Keywords: marketing strategy; regional branding; branding strategy; South Baltic Sea Region; Blue Economy; regional innovation; SMEs

1. Introduction

Sustainable and smart development in the European Union (EU) is at the epicentre of all policy discourses. Applicable innovation and growth policies are key to achieve innovation. In the EU, innovation is highly policy-driven. New EU Industrial Policy based on circular economy principles and the European Green Deal (EGD) as the New EU Growth Strategy serve as key roadmaps. In this sense, all industry sectors and businesses, in particular, Blue Economy, will need to focus in the next future on achieving good environmental and digital status on local, regional and international level, thus also contributing to the Sustainable Development Goals (SDGs) of the United Nations. However, sustainable transition in peripheral regions and remote areas of the EU, bearing in mind their poorer innovation performance and lower industrial power due to scarcity of human, financial or natural resources, low integration and exchange with outstanding regions or increasing macro-regional competitive pressure as well as decreasing cognitive, organisational and social proximity jeopardise the desired development avenues, as set in the recent EU policy agendas.

In this light, South Baltic Sea Region (SBSR) which is the geographical focus of the present research yields patchy development patterns, when it comes to innovation performance (Regional Innovation Scoreboard 2019). Building upon recent available data from 2019 benchmarking of all EU NUTS-2 level regions and comparing regional innovation performance of corresponding regions that belong to the SBSR – Denmark, Germany, Lithuania, Poland and Sweden – remarkable differences can be observed, having Strong Innovators – Danish, German and Swedish SBSR regions one the one hand and Moderate Innovators – Lithuanian regions, followed by Modest Innovators – Polish regions with the lowest innovation capacity. Similar insights were made applying EU Member States' eco-innovation index showing countries' performance in sustainability. The overview of the eco-innovation performance in 2019 yields great disparities among countries like Denmark (2nd rank in the EU), Sweden (4th rank), Germany (6th rank), Lithuania (19th rank) and Poland (25th rank) (Eco-Innovation, Country Profiles, 2019).

Finally, a light on the macro-regional perspective – the entire Baltic Sea Region (BSR) with all the Baltic Sea surrounding countries, SBSR being a part of this macro-region, delivers rather a more exacerbated view on current and future development prospects. On the one hand, SBSR has huge opportunities to learn from the BSR achievements, as the BSR has established itself as a role model for sustainable, green and smart region in the recent years. On the other hand, better competitive position of the BSR and its recognition among other macro-regions might make accessibility and recognition of smaller cross-border region, like SBSR is, more difficult (Philipp et al., 2020).

Overall, the most prevailing challenges in all SBSR countries refer to process-level of innovation, i.e. missing resources efficiency, delivery of sustainable products including missing green investments and R&D personnel available. This makes clear that regional policy makers, knowledge developers and SMEs as regional economy drivers should therefore reinforce internal organisational capacity building in terms of greening (sustainable development) processes and organisational performance on human, product, materials and environmental level, leading to sustainable innovations. In turn, sustainable innovations open up avenues for sustainable growth and increase in competitive advantage. Against this background of presented data, it is crucial to focus on and enhance knowledge transfer as well as capacity building using new tools, establish on-going actions, reinforce conceptualisation and capitalisation on Blue Growth initiatives and incentives as well as to implement joint regional and macro-regional actions supporting regional economy growth and regional development.

In this light, back in 2017, the EU approved the "InterMarE South Baltic – Internationalisation of South Baltic Maritime Economy" project, which is part-financed by the South Baltic Programme 2014-2020. Historically shaped by international collaboration patterns tracing back to the Hanseatic trading era that emerged using natural cooperation platform – the Baltic Sea – SBSR developed into one cross-border maritime region with similar regional identity, social, economic and geographical setting. Considering peripheral regional positioning and aiming to counteract the ailing situation of the region as briefly depicted above, thus contributing to rich natural marine (blue) resources conservation pooled within and around the Baltic Sea, the project aims at reducing regional bottlenecks in terms of lower innovation capacity of SMEs, enhancing better cross-border cooperation through joint cooperative marketing and branding activities and institutionalising new collaboration models as an InterMarE South Baltic blue network and cluster service brand, which is mainly dedicated to service regional SMEs and underpin their marketing and internationalisation capacity over the regional boundaries.

Respectively, within the time frame of 07/2017-06/2021, the research team lead by researchers and academic experts of Hochschule Wismar, University of Applied Sciences acting as research leading partner within the InterMarE South Baltic project consortium, and supported by academic peers from Lithuania, undertook a series of research steps that allowed to arrive at a tailor-made cooperative and region-wide Marketing and Branding Strategy for regional SMEs of all Blue Economy sectors in the SBSR. As a result, the present research depicts key building pillars of the developed Marketing and Branding Strategy dedicated to regional Small and Medium-Sized Enterprises (SMEs) including freelancers and start-ups from the Blue Economy and argues how it can be practically and step-by-step deployed by regional SMEs, academic and research experts and well as within policy discourses that are responsible for shaping and stipulating next future Regional Innovation Strategies (RIS).

The principle idea behind the delivered strategy is to make regional businesses explicit how they can practically improve their marketing and internationalisation capacity including principle responsive and sustainable actions. This research impetus derives from the observed needs of regional SMEs and other actors to "translate" and "decode" Blue Economy policy into business language as well as to strengthen regional SMEs that are operating in times of urgent transformation, increasing complexity and blurring development projection in their innovation capacity improvement, thus paving the way for regional growth and regional development, respectively. In this sense, the research raised the following research question:

How can blue SMEs of the South Baltic Sea Region be supported in their marketing and branding activities enabling sustainable growth of the Blue Economy?

Bearing the formulated question in mind, the research in hands aims at reducing the *science-to-practice research gap*: in the SBSR there could not be located any specific Blue Economy concerning marketing strategy. Browsing of the resource pool, there was located only one marketing strategy that pinpoint the export of Small and Medium-Sized Enterprises (SMEs) in the region (Treder & Kulawczuk, 2012). Yet, this study shows specific export related marketing strategies for individual businesses and organisations. Further similar sources found only touch upon the

issue of the marketing slightly, by paying attention mainly to tourism sector, e.g. destination and marine & coastal tourism (Hacia & Lapko, 2017; Lapko & Müller, 2018; Manniche, et al., 2017; Nilsson et al., 2010; Swacha et al., 2018) or food and agriculture related marketing (Olsson, 2015; Petrenko et al., 2014). In addition, the present research aims at strengthening Blue Growth research by linking nature and society paradigms, thus bringing back social science perspective into the discourse (Arbo et al., 2018, p. 296; Ertör & Hadjimichael, 2020, p. 8).

The present paper is organised in the following way: the next chapter positions SBSR within theoretical and placed-based nexus and is followed by methodological considerations. In the succeeding chapter, the Marketing and Branding Strategy is presented. Discussion and conclusions' chapter positions research results within theoretical and managerial contributions and provides future research avenues.

2. Need for Marketing and Branding within the Regional Setting: Theoretical and Practical Considerations

SBSR's identity is much more than only tourism or food destination. The access to the Baltic Sea and marine resources brings more potential to be fertilised. As the Blue Growth Strategy of the European Commission (EC) COM(2012) 0494 final and related policies highlight, e.g. Report on the Blue Growth Strategy SWD(2017) 128 final or European Green Deal COM(2019a) 640 final, there are further value adding sectors and areas within the established and emerging industries that build up the EU Blue Economy (EC, 2018), in particular when it comes to investment incentives for SMEs contributing towards Blue Economy growth, e.g. aquaculture, renewable energy, seabed mining etc.

Reflecting upon the bigger counterpart – Baltic Sea Region (BSR) – it has so far achieved better recognition on international and global level, by addressing e.g. tourism related and place branding or regional identity building issues (Andersson, 2007; Routes 4U, 2017; Policy Area Tourism of the EU Strategy for the Baltic Sea Region, 2016). Indeed, the BSR is recognised as a strong touristic destination. Furthermore, strategic positioning of the BSR is underpinned through the EU Strategy for the Baltic Sea Region (EUSBSR) and EUSBSR Action Plan 2020, as approved by the National Coordinators Group in 2020 and by the European Commission in 2021 (EC, 2021). Yet, within the BSR ecosystem and without specific place-based marketing and branding, the SBSR is not capable to differentiate itself from the macro-region, which already has done work in place branding.

SBSR frames an integral part of the bigger counterpart macro-region, the BSR. As it is claimed in policy and research discourses, the BSR has sustained its competitive position over the last years among other macro-regions in terms of sustainable marine-driven development and therefore is coined as a flagship marine region in Europe with prevalent good economic, social and environmental performance indicators (Gerlitz et al., 2017; Ketels & Pedersen, 2016; Metzger & Schmit, 2012; Stiller & Wedemeier, 2012; Vitola, 2015). It is therefore clear that SBSR also takes a stake of this outstanding performance. Following the latest issue of the "State of the Region Report" (Ketels et al., 2017), the BSR generated in 2015 an annual GDP of about 2.000 billion EUR, which is equivalent to 12.5% of the EU-28 economy. The performance strength is linked with outputs in two key clusters; a) forestry, furniture and fishing; and b) water transportation including oil and gas and metal mining.

Against this background, the "InterMarE South Baltic" goes a step further and aims at designing the network and cluster-based brand with its strategy that promotes the region with its strong Blue Economy performance instead of individual businesses. Indeed, the scientific community acknowledges that clustering and networking presupposes better recognition and market penetration opportunities (Costa & Verissimo, 2020). Furthermore, it is highlighted in the literature that networks and clusters should put in place not only marketing, but also branding, which is again crucial for the cross-border regional development (Alberti et al., 2016; Knippschild, 2011, Pasquinelli, 2013).

This is highly relevant for the SBSR, which is rather small region in the macro-regional perspective. For this, building up strong institutional framework, involving stakeholders, formulating shared goals and thus delivering the value is at the core of the concerned initiative and the strategy. A shared vision with shared goals is crucial for success in marketing and branding, as one cluster and network organisation such as "InterMarE South Baltic" is a necessity for strategy implementation, joint brand image generation and common brand identity. By echoing Hess (2011), the main effort remains of synchronising individual marketing efforts of sub-regions and nations in order to develop common understanding followed by joint marketing and branding actions (p. 83). As a result, the present work aims also at reducing both research and policy gaps in delivering Marketing and Branding Strategy for the SBSR Blue Economy Growth that builds upon interdisciplinary theoretical approaches addressing wider societal relations and territorial perspectives (Andersson, 2014, p. 151).

When it comes to the geographical place-based positioning, marketing and branding aims at supporting cohesion and economic development within the regional setting, i.e. cross-border region SBSR, whereby the region is referred to as more or less bounded area possessing some sort of unity or organising principles that distinguish it from other regions (Johnston, 2000, p. 687), as a territorially determined unit differing from its surroundings and possessing some form of identity (Tägil, 1983, p. 18). Next to the territorial categorisation, social perception plays in the given context a crucial role, since the present study deals with marketing and branding, which found their conceptual meanings in the social domain of interactions. Indeed, thee recent research purports that building upon relations and gaining relationship values through relationship-specific investments, knowledge sharing, relational norms, marketing capabilities can be improved. Furthermore, cultural sensitivity reduced social and organisation distance (Jean et al., 2010; Lee et al., 2008; Skarmeas et al., 2016). Finally, creativity, open innovation support businesses in innovation and opens up new avenues for growth (Hack et al., 2012).

As a result, the region, and thus the SBSR is determined via social dimension maintaining relations between people, nature and society within the scope of regional formation, underpinned by cultural dimension pinpointing region as an identity of cultural relationships between a group and respective places as well as underpinned by awareness of common cultural similarities among the regional population, e.g. historical trade routes (amber trading) across the SBSR or participation in the Hanseatic League. As a result, marketing and branding of the region concerns interactions and practices reflected through political, economic, cultural administrative, institutional and power relations (Paasi, 2001, p. 16), reinforced by networks, practices and processes spanning beyond the borders of the region (Paasi, 2009, p. 467). Finally, the SBSR stands for a region within the European dimension, a cross-border region, facilitating cohesion and integration of the EU through gathered together administrative territorial units of the Member States of the EU determined on the basis of NUTS classification as individual NUTS-2 regions.

Through intensifying globalisation and arising global networks, new social and environmental challenges jeopardise innovation and growth opportunities in different markets. Indeed, this is especially true for the SME sector and the performance of individual regions in the EU (Prause et al. 2018). Following the European Commission (2018a), more than 99% of all companies in the EU represent micro and SMEs. In 2018, nearly 25 million SMEs in the EU-28 generated about 56.4% of value added and 66.6% employment in the Non-Financial Business Sector (NFBS). Therefore, SMEs are regarded as the backbone and driver of regional and national economies. Thus, there is a need to support SMEs and entrepreneurship, since they have a crucial role in generating economic growth, triggering innovations, attracting new investments and businesses, enabling clusters to evolve, ensuring employability and social integration (Prause et al., 2018; EC, 2019c, 2013a, 2013b).

Here, SMEs will need to find new ways of operation through the lens of the European Green Deal, in particular, Regional Innovation on Smart Specialisation (RIS3) concepts' utilisation (EC, 2020b; Gerlitz et al., 2020). In this particular context, marketing strategy might serve as a source of innovation and thus competitive strength, since the research contends that marketing formulation and implementation has positive effects SMEs innovativeness performance (Finoti et al., 2017). Vice versa, innovation has a positive effect on marketing performance (Afriyie & Musah, 2019). SMEs are regarded as accelerators for innovative products and services of high quality. Yet, in the EU main challenges refer to low SMEs capacity in services' sector and low exports of EU SMEs. in addition, external financing incentives and venture capital investments should be put on the SME development priority lists.

Next to the SME size and performance related obstacles, key future challenges will be circled around missing capacity and capabilities in environmental and digital transition, regional, EU and international policy compliance as well as burning needs to reduce negative footprints in societal, environmental, governance and economic performance domains. New EU Industrial Policy based on circular economy principles and the European Green Deal (EGD) as the New EU Growth Strategy serve as key roadmaps. Future port business will need to focus on transformation by twinning environmental and digital goals. By doing this, it is believed here, a sustainable socio-economic growth can be grounding, simultaneously benefiting business and society, i.e. providing growth opportunities for businesses and meeting needs and expectations of more environmentally conscious society.
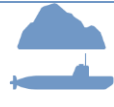
In particular, regional SMEs, policy makers and researchers will need to focus in the next future simultaneously on sustainable development, growth and competitiveness by considering compliance with and contribution to the 17 SDGs of the UN. By now, BSR countries are well on the global level in terms of overall SDG performance, but face challenges in implementation of the 2030 Agenda in most of the SDGs (Beyersdorff & Lanthen, 2018, p. 12; OECD, 2019, p. 12). Specifically, the future actions in the BSR will need to focus on SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities); SDG 12 (Responsible Consumption & Production), SDG 13 (Climate Action) and SDG 15 (Life on Land). The major challenges are to be expected in the implementation of the SDG12 and SDG 13, since in these two areas all BSR countries perform bad (ibid., p. 12).

In this vein, more potential and proactive approach is needed, increase in cooperation, multi-sectoral and holistic engagement (Ahlgren, 2019, p. 2; Böhme et al., 2016, p. 4; EC, 2021). A special emphasis will be needed for a circular economy, green technology sophistication, increase of ecological footprint (Borges & Topsiduo, 2020, p. 7) as well as green sense making among local policy-makers in terms of sustainable place-based development (Andersson, 2016, p. 1197

3. Methodology

The present research focuses in Blue Economy sectors in the SBSR. Here, established and emerging sectors are considered to be core and driving forces of the Blue Growth in the region and in the entire EU. Therefore, research was conducted with participation of the following target groups:

Table 1. Focused Blue Economy Sectors / Industries

Established Sectors	Emerging Sectors
Coastal tourism ■ Hotels and accommodation ■ Recreation infrastructure and actors ■ Mobility and transportation	Blue biotechnology ■ Biofuels (algae) ■ Pharmaceuticals, chemicals ■ Health ■ Genetics
Marine living resources ■ Aquaculture ■ Processing, retail and wholesale of fish, crustaceans and molluscs ■ Extraction of marine living resources	Coastal and environmental protection ■ Carbon capture and storage ■ Coastal and habitat protection
Marine transport ■ Sea and coastal passenger water transport ■ Sea and coastal freight water transport ■ Inland passenger water transport ■ Inland freight water transport ■ Renting and leasing of water transport equipment	Desalination ■ Fresh water supply Marine defence and security ■ Marine surveillance
Offshore oil and gas ■ Extraction of crude petroleum ■ Extraction of natural gas ■ Extraction support activities	Marine research and education
Port activities ■ Cargo handling ■ Warehousing and storage ■ Construction of water projects ■ Water transportation related activities	Ocean energy ■ Offshore wind ■ Ocean wave and tidal energy Submarine cables
Shipbuilding and repair ■ Building of ships and floating structures ■ Building of pleasure and sporting boats ■ Repair and maintenance of ships, floating structures and boats	Seabed mining ■ Aggregates ■ Marine minerals

Source: Compiled by authors

Overall, the present research utilises the case study methodology by combining theoretical considerations of Merriam (2008) and Yin (2018). First, it is because the focus of the research is on social constructs. Therefore, we combine quantitative and qualitative data, thus supporting Yin's conception, while we also consider social aspects and perception of a case as a specific institution or a socially determined construct as important aspects in the face of the target groups – regional SMEs. The aggregated research trajectory can be summarised in the following way:

- Research scope: Interreg VA project InterMarE South Baltic.
- Geographical coverage: South Baltic Sea Region – Danish, German, Lithuanian, Polish and Swedish Spain (Valencia), South Korea (Busan), United Kingdom (London), Norway (Oslo), the Netherlands (Amsterdam)
- Research scale: around 130 surveyed SMEs from the SBSR
- Research time lapse.   07/2017-12/2020
- Research approach: inductive
- Research methods: survey, expert interviews, study visit reports
- Research data: quantitative and qualitative
- Research techniques: data analysis, explanation building
- Research validation: external validity by SBSR SMEs; maritime experts evaluation

Wrapping up the research journey we claim that we underpin the qualitative research methodology by integrating the so-called actor's approach (Arbnor & Bjerke, 2008). The research deals with reality and real challenges of SMEs addressed within the applied research project. The reality is socially constructed including and integrating stakeholders, participating and constructing sense-making and understanding (Creswell, 2013; Lincoln et al., 2011). This reality is constructed by a number of meanings that are shared by a larger and small number of people (Arbnor and Bjerke, 2008, p. 66). Indeed, understanding of the observed and analysed reality as a social construct lends a strength to the present research. In this regard, employing the actor approach is argue to be feasible and beneficial both to science and management practice.

In sum, the researchers disclosed their bias through the participation in the project as leading researchers and encountered this through involvement of experts in validation of the results as well as presentation of the intermediate results to direct target groups – regional SMEs – to get their feedback on marketing and branding strategy's value added and transferability.

4. Regional Marketing and Branding Strategy and Its Managerial Implications

SMEs are regarded as backbone and drivers of regional and national economies. Therefore, there is a need to support SMEs and entrepreneurship, since they have a crucial role in generating economic growth, triggering innovations, attracting new investments and businesses, enabling clusters to evolve, ensuring employability and social integration. Hence, SMEs are regarded as accelerators for innovative products and services of high quality. Having analysed SBSR past successes, understood current challenges and projected future bottlenecks and potentials, for strategists, it is essential to know main players and key performance influencing factors within the SBSR ecosystem and beyond its boundaries. To meet growing requirements to parse volatility, complexity and ambiguity of interactions, the developed SBSR Marketing and Branding Strategy, as depicted below, can help out regional businesses, planners, governance bodies, decision makers, regional managers and other strategists to easier navigate within Blue Economy innovation and promotion

4.1 Marketing and Branding SBSR as A strong Blue Resource and Competence Cluster

The InterMarE South Baltic brand as a networking and cluster service for blue economies serves as facilitator of businesses and adjusts their individual activities to innovation policies. Thus, the cluster aims at supporting individual blue SMEs by offering knowledge, experiences, contacts and consultancy to strategically match daily business with European, national and regional policies with focus on the Blue Economy. Hence, it is not the objective to tell companies how to further develop their business in detail, but to provide several insights of Growth Strategies, which should be adapted to individual company demands.

Table 2 introduces some key facts to be fuelled into business by maritime SMEs when considering Blue Economy development and resources' allocation to daily business. The three columns indicate necessary topics to be addressed when developing any business strategies in line with Blue Economy: Resources & Capabilities, Innovation & Strategy and Sustainable Organisation Ecosystem. Furthermore, the matrix provides some key facts or insights, which represent each category and should be reflected in business strategies or at least be discussed and analysed internally, e.g. branding activities on company level to create and establish InterMarE South Baltic network and cluster. In addition, a differentiation of short- and long-term is offered on a quite general level at this stage. The short-term recommendations mainly refer to identification of own potentials for future development as well as analysing the state of the art for the own business. In the long-term, new technologies and sustainable mechanisms have to be incorporated to the company ecosystem.

Table 2. SBSR Marketing and Branding through Resource Pooling and Innovation

1. Build up Your Resources & Capabilities for Smart and Sustainable Blue Economy	2. Engage into Blue Economy Innovation & Strategy Exploitation	3. Capitalise on Blue Economy from Branding & Engagement in Sustainable Organisation Ecosystem

▪ Mobilise your Competitive Resources and Core Competences essential in meeting growing demands for sustainable and smart Blue Economy in the following areas:
  o Human Capital – increase interactions and collaboration, since SBSR is peripheral and rural areas' comprising region, thus making joint action as a strength
  o Social Capital – improve your empathy and understanding of ecosystem and systematic cognition – ecological, economic, financial, institutional; remember that customers / users play crucial role for your success and / or failure through trust, positive experience, shared values
  o Knowledge Capital – develop future skills in analytics, innovation, problem solving, Big Data, IoT, micro-electronics, batteries, cyber-security, STEM subjects, critical thinking and creativity; invest in resilience for uncertain futures; know Sustainable Development Goals
	▪ Know and consider key future trends & emerging markets:
	  o Clean Technologies in production, transport & logistics, consumption (food, textiles, clothing), tourism, space and automotive
	  o Resource Efficiency related technologies eco-design production, re-use and recycle (waste-to-energy)
	  o Digital Transformation (hardware, software, e-commerce, wireless services, online banking, Blockchain)
	  o Mobility technologies (waterborne freight transportation and passenger mobility)
	  o Environmental Industries
	▪ Utilise strength of industry cluster within and beyond the region and engage into them – EU Cluster Mapping Tool, EU Regional Ecosystem Scoreboard
		▪ Build up your Competitive Advantages by means of:
		  o value creation – use the addressed key future funding areas, trends and markets
		  o become a game changer through deployment of Smart Specialisation principles and contribution to Regional Innovation Strategy (RIS)
		  o claim and prove your contribution to the European Green Deal
		  o claim your contribution to the SDGs and Agenda2030
		▪ Join InterMarE South Baltic Brand by:
		  o Joining the network through the database on intermare-southbaltic.eu
		  o Join events, exhibitions and trade fairs organised or promoted by the

1. Build up Your Resources & Capabilities for Smart and Sustainable Blue Economy	2. Engage into Blue Economy Innovation & Strategy Exploitation	3. Capitalise on Blue Economy from Branding & Engagement in Sustainable Organisation Ecosystem
(SDGs) and tools that you can apply on your institutional level ○ Cultural Capital – deploy shared leadership principles enabling at shared value creation; build upon Baltic Sea Region cultural and historical identity ○ Technological Capital – increase availability and deployment of digital footprint, IT, AI tools, cloud computing, automation, producer-user interaction interfaces ▪ Utilise available competitive resources and increase share of sustainable resources' use, e.g. marine bioresources; offshore / solar energy; aquaculture; ocean energy ▪ Adopt smart and innovative concepts, e.g. waste as a resource and similar business models ▪ Know applicable legal frameworks and applicable roadmaps, e.g. European Green Deal, SDGs, Davos Agenda 2030, European Skills Panorama ▪ Deploy tools for making your tailored-made analysis: SWOT, PESTLE, STEEP, DPSIR; Life Cycle Approach, Scenario Development, Customer Journey, Persona Method, Shadowing, etc. ▪ Develop your one marketing concept with the steps: ○ use regional identity (water, health, environment, history) for your marketing purposes; ○ analyse your products or services in terms of societal, environmental and economic sustainability principles; resource efficiency; circular economy; aesthetics, desirability (appealing) and durability; ○ analyse your target groups on local, regional and international level ○ plan specific tailored-made marketing measures – communication and distribution ○ use collaborative and branding platforms – InterMarE South Baltic, topical exhibitions and fair trades ○ ensure institutional, financial sustainability of your marketing strategy	▪ Innovative through learning – benchmark yourself against others in terms of productivity, innovativeness, social, economic and environmental sustainability, digitalisation, governance and leadership ▪ Engage into innovation-driven or accelerating processes: ○ Investments / Funds – use EU, national and local investments and incentives supporting your environmental and digital transition, e.g. EU Innovation Fund, Just Transition Fund, New European Bauhaus Initiative, Horizon Europe Programme, EU Structural and Regional Funds ○ Economic efficiency – design sustainable business models benefitting the entire ecosystem ○ Capacity Building – remember that EU sets out to support Europe's twinning lighthouses / leaders – green and digital transition going hand in hand ▪ Boost and make use of cross-border cooperation: ○ Exchange knowledge through projects, events and resources that are free of charge, thus saving own resources, but building networking, knowledge capacity ○ Learn on and from best practices from innovation leaders in the region (Sweden, Denmark, Finland) through cooperation across borders ○ Create synergies that enable boosting your performance and marketing activities – joint market performance and penetration, public awareness raising, solidarity in the region ○ Attract EU funds for any projects you need to implement through engagement in topical networks or finding your local contact points, e.g. Enterprise Europe Network (EEN); Interreg, Horizon Europe Contact Points	InterMarE South Baltic brand and network ○ Get revenues from the joint commercial activities (promotion campaigns) through placement on your logo on the InterMarE South Baltic brand and network ○ Reduce your investment costs for marketing and branding activities through InterMarE South Baltic brand and network standing for maritime cluster, as clusters have proven higher productivity ○ Increase your visibility and attractiveness by joining the InterMarE South Baltic brand and network – maritime SMEs are dispersed and bound mainly to periphery of economic interactions ○ Improve orientation, facilitate reliability and decision making

	1. Build up Your Resources & Capabilities for Smart and Sustainable Blue Economy	2. Engage into Blue Economy Innovation & Strategy Exploitation	3. Capitalise on Blue Economy from Branding & Engagement in Sustainable Organisation Ecosystem
Short-term	Future Resource / Competence Identification & Development	Identification of Future Profitable Performance Areas and Actions Improving Environmental and Digital Transition	Positioning in the Market through Collaborative Brand
Long-term	Skills, Capacity and Competence Building Meeting Future Demand and Reducing Bottlenecks	Competitive Advantage Sustainable Growth Perspectives	Sustained Competitive Advantage Shared Value Creation Customer / User Binding

Source. Compiled by authors.

In order to capitalise from new knowledge and skills as well as increase deployment of improved capacity on the SME level, SMEs should be aware of available sources on the EU and international level that would grant not only access to information and knowledge about responsible innovation spurring institutions, innovation governance patterns, but also provide entrance to tools of benchmarking, databases and sites of innovation funding. Preliminary the most important institutions on the EU level facilitating innovation performance measurement and future foresight are the following:

- European Innovation Scoreboard / Regional Innovation Scoreboard
- Regional Innovation Monitor Plus
- KETs Observatory
- Virtual Tourism Observatory
- European Cluster Collaboration Platform
- COSME Programme
- Horizon 2020 / Horizon Europe
- European Structural and Investment Funds
- European Investment Bank and European Investment Fund
- SDG Index and Dashboard.

All above listed institutions facilitate responsible innovation development, access to innovation funding and support for innovation. They can be used as initial stepping stone for SMEs in order to start they search and resources' pooling. As a result, the project proposes the InterMarE South Baltic Marketing and Branding Strategy, which follows the rational incentive in, first, utilising existing and or building up new resources, competencies and capacities that will be in high demand in the next future.

4.2 Marketing and Branding SBSR as A Learning Region with Entrepreneurial Discovery and Smart Specialisation

In order to capitalise from gathered knowledge, built up competencies and capacities as well as to engage into entrepreneurial discovery process, which, in turn, follows combination and integration of knowledge from different domains and under inclusion of different across academia & research, policy makers, businesses and society at large, SMEs are given sound capabilities to engage into innovation – creation and discovery process. Another crucial policy approach, which needs to be implemented on business level as well is Smart Specialisation or

Regional Innovation on Smart Specialisation Strategies (RIS3). The Smart Specialisation approach is one of the key pillars of the Europe 2020 Strategy in terms of economic development and growth policy thinking (McCann & Ortega-Argilés, 2011) as well as an approach to avoid dissipation of European Union (EU) funds among regions (Rusu, 2013). The basic idea can be traced back to the rising productivity gap between Europe and the USA in mid 90's, when European policy makers had to look for alternative policies to impede further economic back path. After announcing the Smart Specialisation initiative on European level, all NUTS-2 regions were in a position to develop individual strategies according to this top-down policy and include sufficient monitoring systems. With the ending of the funding period 2014-2020, the strategies will be monitored on successful policy implementation deriving recommendations to amend the regional Smart Specialisation Strategies for the upcoming funding period 2021-2027.

To continue sustainable development in Europe, the European Green Deal was announced as the new Growth Strategy for the EU towards a more sustainable economic and society (EC, 2019). This strategy aims to cover all economic sectors by introducing new growth opportunities and activities. However, new strategic governance capacities are required for successful implementation (Larosse et. al., 2020). The Smart Specialisation approach follows the same idea to identify and use regional potentials to support innovative and competitive development. Therefore, Smart Specialisation policy can be a key pillar in the European governance transformation to reach the objectives of the European Green Deal until 2050. Thus, a specialisation by the regions using Key Enabling Technologies (KETs) or Knowledge Intensive Business Services (KIBs) to particular fields or priorities is unavoidable.

The strategic matrix on SBSR Marketing and Branding by means of Collective Learning and Entrepreneurial Discovery on individual SME level as shown in Table 3 below proposes key fundamental actions that are necessary across the entire Regional Ecosystem Interaction Domains to enable blue SMEs to build up innovation capacity starting from:

a) resources pooling and generation;
b) over deployment of resources for innovation;
c) towards improving strategic positioning and competitiveness through rare, non-imitable, and non-substitutable as well as valuable resources, competencies and capacities; and
d) arriving at holistic perception of an organisation and the entire region as a sustainable and smart one.

These four fundamental steps empower regional SMEs to develop their own strategies and / or improve existing ones in a step-by-step approach addressing challenges, needs and expectations from the entire social and economic system. Considering given European policies for business strategy development, SMEs shall parse that innovation in the EU, and especially in the SBSR, which due to its natural position is bound to environmental compliance, as a policy-driven approach, where most of business interactions under the given new transformative conditions, such as high resource efficiency and sustainability, environmental compliance, social inclusion and growing integration, require new (re)combination of strategic actions and adaptations. Only by doing this, the SBSR and its main business players will be able to break through the peripheral position the region has occupied and to excel itself as the region with strong knowledge, sound learning & discovery potentials and placement of customers and users into the centre, thus leading towards shared value creation, which, in turn, is at the heart of the brand.

The Table below merges the four introduced Interaction Domains of blue SMEs (columns) and four key areas to be considered for participation in the RIS3 from a business perspective. As argued in the earlier sub-chapter considering European policies for business strategy development creates direct and indirect benefits for SMEs. The same idea applies for Smart Specialisation and the regionally identified priorities. From the business perspective the Entrepreneurial Discovery Process (EDP) is a crucial component to implement this innovation policy. Such processes are based on Open Innovation as well as interdisciplinary and collaborative approaches. Nevertheless,

detailed "planning" of an EDP is not possible, but can be fostered and accelerated through business activities and strategies.

Table 3. SBSR Marketing and Branding through Learning and Discovery

	Technology Architecture	Institutional Architecture	Socio- Environment Architecture	Market (Place-based) Architecture
Resources & Competence Portfolio	▪ Build-up resources and competences needed for Key Enabling Technologies (KETs): o Advanced Manufacturing Technologies o Industrial Biotechnology o Nanotechnology o Advanced Materials o Micro- / Nanoelectronics o Photonics ▪ Use Advanced Technologies that will guide future transition: o Internet of Things (IoT) for mobility o Blockchain o Robotics o Artificial Intelligence o Virtual Reality (VR) o Big Data	▪ Align your next years' strategy, business plans and business modelling in line with the key EU priorities on structural and regional levels: o 6 political priorities of the EC for 2019 – 2024: protecting citizens and freedoms; developing a strong and vibrant economic base; building a climate-neutral, green, fair and social Europe; promoting European interests and values on the global stage o Align your activities on regional level with the EU regional development and cohesion policy: smart Europe, greener and carbon free Europe, connected Europe, social Europe and Europe closer to citizens ▪ Consider the European Green Deal priorities and targets for 2030 and 2050 ▪ Ensure your business performance and future actions in line with the UN Sustainable Development Goals (SDGs)	▪ Focus on intertwined domains of social interactions: o Human Capital o Cultural Capital (Regional Identity) o Knowledge Capital ▪ Strengthen interpersonal communication skills in and outside your business ▪ Focus on multicultural competence building ▪ Strengthen multilingual competence base ▪ Improve your emotional intelligence: empathy, leadership, shared responsibility, cooperation, stress tolerance ▪ Be open for new things and engage into learning avenues	▪ Know cost structure of your own and your competitors' offers on the market ▪ Consider existing and projected market share of offerings ▪ Strengthen positioning on the market through entire ecosystem integration ▪ Accept customer / user integration into new offering development ▪ Comply with sustainability principles enabling social equity, environmental responsibility and economic efficiency ▪ Focus on Knowledge-Intensive Business Services (KIBS) in your offering portfolio
Innovation (Processes) & Strategic Positioning	▪ Consider diversification of your offering portfolio by moving rather from sole product offering towards product-as-a-service offerings, thus	▪ Make your offerings: products, services processes or marketing solutions compliant with EU policies and governance	▪ Mind sustainability principals once offering something to the market ▪ Ensure that any of your offerings is in line with the	▪ Engage into Entrepreneurial Discovery Processes ▪ Apply for available Research & Development Funds

	Technology Architecture	Institutional Architecture	Socio- Environment Architecture	Market (Place-based) Architecture
	enabling entering of niche markets • Develop your innovative offerings using processual and holistic innovation canvas • Engage more in tangible piloting and demonstration actions	• Utilise innovation driving EU tools and incentives or your business acceleration • Strengthen your marketing & positioning through customer / user engagement and more interactions • Develop supportive business models	environmental policy and regulations • Focus on natural resources reduction for your trade offerings • Think of waste as a resource	on local, national and EU level • Utilise Growth Strategies for your own business purposes
Branding & Brand Positioning	• Become a lighthouse in Digital Transformation in Blue Economy • Differentiate yourself as first-mover	• Engage into Smart Specialisation with areas of energy, biodiversity, circular economy, maritime tourism, aquaculture and thus ensure public governance support for your business	• Position yourself as agents in Social and Environmental Compliance • Use credentials of Circular Economy and promote yourself as care-taker	• Consider different marketing activities for different markets you are operating in • Uphold sustainable transformation through new learning cycles
Sustainable Competitive Organisation & Ecosystem	• Improve and boost your operational and technological capacity • Established infrastructure that will meet future production or servitisation requirements	• Build up your future business around pillars of resource efficiency, differentiation and strategic Flexibility • Capitalise on build up trust and customer satisfaction, thus enabling sustainable growth through customer / user bonding	• Benefit from state-of-the-art knowledge and competences • Build up competitive and dynamic capabilities • Benefit from social mindset, thus increasing your visibility and reliability in public and non-profit sectors	• Become strong partner in sustainable supply chains • Establish yourself as sustainable business offering green products and services

Source. Compiled by authors.

Within the table, key facts and areas are listed to classify the four introduced interaction domains to the Smart Specialisation concept. In addition, branding is included as main objective of this conducted strategy. Again, this table aims at revealing key points that should be reflected in business strategies for future business development in line with RIS3 and of course Blue Economy.

4.3 Marketing and Branding SBSR with A Shared Vision for the Future

The last strategic matrix of layer delivers key strategic actions placed in the time axis. In this, specific short- and long-term actions are proposed that enable regional SMEs and the entire region to smoothly move towards digital transformation, smart specialisation and thus strengthen competitive position and branding of the region and SMEs innovation outputs. The previous two sub-chapters already mentioned two important innovation policies for future European and SBSR development. Hence, from the SMEs perspective not all activities may fit into this kind of policies. Nevertheless, the uncertainty of failing will strongly decrease for all businesses being able to adapt future visions for the own strategy development in line with mentioned policies. Therefore, the following Table 4 provides specific actions, which should be part of any companies' strategy and future orientation of the own business under

the three identified future visions of Digital Transformation, Smart Specialisation and Branding. Activities are divided into short-term and long-term perspective and are shortly justified from the present point of view.

Table 4. SBSR Marketing and Branding through Shared Vision and Value Creation

Future Vision	Short-Term (2025)		Long-Term (2030 – 2035)	
	Why	**What**	**Why**	**What**
Digital Transformation	▪ COVID-19 pandemic hit global, national and regional economies, in particular remote peripheral regions like SBSR is ▪ Modern business requires shared value creation through increased customer / user engagement ▪ Increase competitiveness ▪ Design efficient enterprise processes	⇒ Implement continuous and tailored made competence building in future industry, technology and demanded skills areas ⇒ Upgrade your digital infrastructure in due course ⇒ Automate your physical infrastructure ⇒ Engage into networks and clusters enabling to overcome isolation	▪ Emergence and intertwining of markets through digitalisation ▪ Increase of security and safety on markets through, e.g. Smart Contracts ▪ Increase in horizontal collaboration and cross-cutting issues (e.g. environment + society + education + smart specialisation)	⇒ Make a switch to IoT and Blockchain ⇒ Increase utilisation of digital tools ⇒ Maintain data security ⇒ Develop digital products and services ⇒ Become a mind changer and focus rather on customer through services and business models of product-as-a-service
Smart Specialisation	▪ Access to funds on regional level will be bound to compliance to Eu cohesion policy and regional development policies ▪ Competition over EU funds for innovation will increase ▪ EU will guide future industry development through prioritisation of specific highly competitive sectors and areas	⇒ Check if your business plans are in line with regional, national or EU priorities ⇒ Check market structure and market conditions in markets in which you operate ⇒ Foster inter- and intra-Entrepreneurial Discovery Processes ⇒ Ensure your innovation security through patent applications ⇒ Focus on cross-sectoral collaboration ⇒ Concentrate on Emerging Industries	▪ Transition to uncertain future markets with volatile, complex and ambiguous environment ▪ Increase of Future and Emerging Technologies through dedicated funding (e.g. Horizon Europe Programme) ▪ Increased global competition with new emerging world regions ▪ Regional resource vulnerability	⇒ Ensure on-time access to global resource & competence pool ⇒ Regularly upgrade competitive edge of your business and your smartness ⇒ Attract and sustain talents in your business and in the region ⇒ Focus on competitive strength's sources – creative tools and design needed for integrative and complex problem solving, (eco)system thinking and acting
Branding & Competitive Edge	▪ Synergy and scale effects ▪ Increase in intersectoral cooperation	⇒ Enter specialised InterMarE South Baltic network and brand your business together with other – acting	▪ Growth of world brands and customer bonding ▪ Increase in emotional and behavioural	⇒ Engage in global value chains ⇒ Increase your customer / user interactions ⇒ Sustain utilisation of InterMarE South Baltic

Future Vision	Short-Term (2025)		Long-Term (2030 – 2035)	
	Why	**What**	**Why**	**What**
	▪ Call for knowledge exchange ▪ Increase in interregional cooperation across world regions ▪ Increase of intertwined market and moral economies with multicultural offerings	together makes you stronger ⇒ Participate in growing networks and clusters ⇒ Increase utilisation of public-private partnerships and value generation for public / social purposes ⇒ Establishing your brand policy	marketing through more visualised and emotional appealing ▪ Increase in competition about customer / user data ▪ Increase focus on servitisation rather on pure product offering on the market, thus making customer / user a central offering element	brand for your regular internationalisation activities ⇒ Participate in regular branding and strategic positioning events ⇒ Benchmark your marketing and branding activities with global leaders and learn from them

Source. Compiled by authors.

Future Visions are a selection of currently discussed obstacles for blue companies in the SBSR and could be enlarged on individual basis with further visions such as Green Technologies or Sustainable / Regional Supply Chains. Nevertheless, following previous argumentation and the character of this Marketing and Branding Strategy on macro-level, the three proposed future visions should be identified by every SME of the SBSR and therefore add value to this strategy document. The proposed actions need to be adapted and further developed into clear actions by each company depending on the individual needs and obstacles, which means to transform this theoretical strategy into practical actions in daily business of the respective SME. However, the Table below offers a first approach as a framework to develop individual growth and marketing strategies within the companies by presenting key issues to be analysed and elaborated for the short- and long-term perspective of blue SMEs in the SBSR.

5. Discussion and Conclusions

SBSR Marketing and Branding Strategy builds upon three blocks and shall be perceived from an ecosystem and processual perspectives. In this, SBSR Marketing and Branding is driven by the following strategic actions:
   a) establishing tools for resource pooling, allocation and (re)combination leading to knowledge excellence and, in turn, innovation development, arriving at sustainable organisational (regional) ecosystem;
   b) providing key entrepreneurial and creative discovery related tools; and
   c) transforming the SBSR into a Brand with shared future vision and joint strategic positioning.

The authors of the Marketing and Branding Strategy believe that in order to be competitive on the market (would it be domestically, regionally or macro-regionally), it is essential to adopt innovation-driven transformation concept and to perceive SBSR Marketing & Branding as an on-going continuous and holistic process. Therefore, the following conclusions and managerial implications are formulated:

▪ Innovation approach and its processual meaning embraces the idea of marketing and branding, as from the processual perspective innovation results from a thorough customer and user-engagement (who, where and how), step-by-step approaches (processual perspective) and sound perception of a product / service,

organisational process or marketing model (depending on the innovation goal itself) delivering shared monetary and social value for both customers / users and owners (innovators).

- In this, in its nature, innovation concept already includes key elements of the 7 Ps concept (7 elements starting with "P"), i.e. Product, Place, Price, Promotion, People, Processes and Physical Evidence (tangible and intangible features of the innovation, like. shape, design, experience, usability, etc.).

- As a result, with this approach, beneficiaries of this Marketing and Branding Strategy do not need explicitly to focus on 7 Ps, as during the process of innovation, all these 7 aspects are consciously covered, which showcases practical innovation development step and how you as beneficiaries can combine and dovetail all these issues into one approach – innovation process.

- Further, advocating innovation-driven approach yields further benefits: innovation approach enables to generate changes in an organisation from an ecosystem and holistic perspective, i.e. inside-out (building up innovation competencies and capacities) and outside-in (improving external performance, competitive edge of an organisation through better tailored-made marketing and branding activities). This paves the wave for both development of new managerial competencies (organisational level) to meet transformation needs in the next future on the one hand, and smoothens the shift in the paradigm, e.g. system changes on the market, e.g. new technologies emergence (external market level) on the other hand.

- Innovation approach is proved to be a key to growth, competitiveness and differentiation. As a result, combination of marketing and branding activities for the SBSR and the creation of "InterMarE South Baltic" Brand is a first essential step for the region and regional players to set themselves from other counterparts.

Theoretically, this research contributes towards behavioural and organisation studies and, in particular, enhanced regional marketing and branding scientific contributions. The most important scientific benefit remains a first contribution towards marketing and branding discourse in the SBSR that go beyond touristic and regional identity considerations, but rather addresses challenges and raises potentials immanent with regional businesses that mainly are responsible for economic growth. In addition, the paper contributes to the growing needs to include social aspects ans strengthen Blue Growth discourses from social sciences' perspective. The research purports that succeeding research contributions are essential on tracing effects of marketing and branding within SMEs and other stakeholders that apply this strategy and principle steps. The same applies to quantification of strategy transferability and applicability outside the region. In addition, underlying interactions among involved stakeholders and importance of multi-level governance for Blue Economy growth, in particular, support from helix actors for regional blue SMEs in their growth strategies' formulation and implementation should be put as key research topics both on academic and policy agendas.

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Laima GERLITZ, PhD. Laima Gerlitz is a researcher at Wismar University of Applied Sciences: Technology, Business and Design and PhD Student at Tallinn University of Technology within the fields of project, design and transport related management. Since 2014, Laima Gerlitz is researching on her PhD topic "Design as Success Factor for Innovation, Competitiveness and Smart Growth". Key fields of research are design and innovation, strategic design management, design management for enterprises, competitiveness and value creation deriving from design-driven approaches in organisational settings, particularly in the context of small manufacturing and high-tech enterprises and start-ups.
ORCID ID: orcid.org/0000-0002-7127-7678

Christopher MEYER, M.Sc. Christopher Meyer coordinates several European research projects at the European Project Center associated to the University of Wismar. After his master degree in public economics, he started his studies as PhD Candidate at TalTech University in Tallinn, Estonia, elaborating the impact of Smart Specialisation on the Blue Economy of the Baltic Sea Area.
ORCID ID: orcid.org/0000-0002-6048-1198

Prof. Dr. Gunnar PRAUSE is a professor at the Tallinn School of Economics and Business Administration at Tallinn University of Technology (TU) Tallinn in Estonia as well as at Hochschule Wismar, University of Applied Sciences: Technology, Business and Design in Wismar, Germany. Professor Gunnar Prause has published widely internationally and has many years of experience in carrying out national and European (research) projects.
ORCID ID: orcid.org/0000-0002-3293-1331

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HELPING INTENTION, TRUST AND PERFORMANCE APPRAISAL IN THE CONTEXT OF CULTURE, POWER AND GROUP: A SCENARIO-BASED EXPERIMENT

Adem Baltacı

Faculty of Political Sciences, Istanbul Medeniyet University, 34720, Dumlupinar Mah. Kadikoy/Istanbul, Turkey

E-mail: adem.baltaci@medeniyet.edu.tr

Abstract. This study aims to examine helping intention, trust, and performance appraisal which are critical variables of the organizational environment, in the context of culture, power, and group. In accordance with this purpose, the helping intention, trust level, and performance scores towards employees are examined according to the values/norms, being high-power/low-power, and being ingroup/outgroup. Therefore, the scenario-based experimental method, which is not common in the management literature but powerful in explaining the causality between variables, is used in a 2x2x2 factorial design. As a result of the analysis carried out, it is seen that the performance scores and the helping intention stated in the context of values are higher compared to norms, while the level of trust is lower. It is also found out that performance scores and helping intention towards ingroup are higher compared to the outgroup. Here, contrary to expectations, it is seen that the level of trust does not differ according to ingroup or outgroup. Finally, it is determined that high-power individuals give lower performance scores and demonstrate lower levels of trust and helping intention compared to low-power individuals. The results also showed that there are some 2-way relations of independent variables that are effective on dependent variables.

Keywords: Culture; Value; Norm; Power; Group; Helping Intention; Trust; Performance Appraisal

1. Introduction

In understanding work-related behavior, personal values, cultural norms, group behavior, and power are fundamental. This importance of values and norms has been implied, but its relation to the perception of power and group behavior has not been explicitly tested in previous management literature. Previous studies that rely solely on personal values in explaining one's behavior have come under significant criticism. Many studies now show that cultural norms along with values play a significant role in determining one's behavior (Audretsch, 2020; Gelfand & Harrington, 2015; Masson, Jugert, & Fritsche, 2016; Smith, 2017). Although the normative perspective has vital importance in explaining work-related behaviors (Fischer, Ferreira, Van Meurs, Gok, Jiang,

Fontaine, Harb, Cieciuch, Achoui, Mendoza, Hassan, Achmadi, Mogaji, & Abubakar, 2019), it is noteworthy that few comparative studies examine whether values or norms that have different weights in different situations (Leung & Morris, 2015) are more prominent in explaining work-related behaviors.

It is generally accepted that power is a significant factor in creating social relations (Lee & Tiedens, 2001). Accordingly, there are implicit or explicit power differences among employees in many organizations. For example, due to formal organizations' nature, managers can control more resources and have high-power. On the other hand, comparatively, subordinates have less control over resources and have low-power (Ferguson, Ormiston, & Moon, 2010). Power is a concept that has long been examined in social sciences. Although the concept of power has been discussed in detail in management sciences (Lee & Tiedens, 2001), the relationship between power and desired organizational outcomes still needs to be examined (To, Leslie, Torelli, & Stoner, 2020).

Groups are at the base of the constitution of human societies. Such that by nature, people tend to belong to a group and describe the world by classifying. Here the primary classification is being ingroup or outgroup (Varga, 2018). Studies conducted in the context of groups show that individuals' behavior towards ingroup and their behavior towards outgroup differ (Gelfand & Harrington, 2015) and there is apparent favoritism towards ingroup (Dunne, 2018). So, determining how individuals' behavior differs towards ingroup and outgroup is vital to predicting and managing their behavior in organizations.

In this study, the variables of helping intention, trust in employees, and performance appraisal, which have an essential place in management and human resources, are discussed in the context of norms vs. values, ingroup vs. outgroup, and high-power vs. low-power. These variables, which are the subject of much research in the literature, are not considered in terms of culture, power, and group in Turkish academic literature. Moreover, the use of the scenario method in this study, unlike the general research methods used in the literature, constitutes the research's motivation.

There are lots of evidence that show Organizational Citizenship Behavior (OCB) is vital to the survival of today's organizations. Accordingly, helping behavior, one of the dimensions of the OCB (Van Dyne & LePine, 1998), is necessary for organizations to function more effectively (Fischer et al., 2019). In this context, it has been shown that the level of help that employees receive can affect different areas of their careers, including their work performance (Yoon & Farmer, 2018).

Furthermore, it is a well-known fact that performance appraisal is necessary for organizations' healthy functioning (Mishra & Roch, 2017). In addition, since performance appraisals have an interpersonal aspect, it is only natural that they are affected by values, norms, attitudes, and beliefs (Cho & Payne, 2016). Therefore, it is necessary to examine how performance appraisals are affected by cultural norms and values (Mishra & Roch, 2017). Thus, not only the role of norms and values but also how group dynamics affect the performance appraisals will be discussed (Smith, DiTomaso, Farris, & Cordero, 2001).

The concept of trust is also necessary for both society and organizations, in particular, to work effectively (Kaltiainen, Helkama, Jasinskaja-Lahti, 2018) and has lately become one of the focal points in the field of social sciences (Van Hoorn, 2015). As societies become more diverse with globalization (Glanville & Shi, 2020), the concept of trust has gained more importance. It has shone out significantly in terms of global business (Ajmal, Helo, & Kassem, 2017). Because trust is a form of relationship in social environments that supports coordination and interaction (Ajmal et al., 2017), establishing trust within an organization can improve areas such as organizational competitiveness, innovation, creativity, (Zhu, Habich, & ThØgersen, 2018), productivity, teamwork, job satisfaction (Kaltiainen et al., 2018).

The rest of the manuscript is organized as follows: first, we review the literature in the areas of value vs. norm, ingroup vs. outgroup, high power vs. low power, the literature review followed by the development of hypotheses. In the methodology section, the scenario-based experiment we used to test the hypotheses is introduced. After the results and discussion parts, the paper is concluded with the limitations and future research opportunities.

2. Conceptual Framework and Hypotheses

Values vs. Norms

A value is a concept that directs individuals to choose specific behaviors over others because they are personally or socially more acceptable (Gomez & Taylor, 2018). On the other hand, social norms are unofficial rules accepted or considered appropriate by society (Varga, 2018). Values differ between individuals, whereas norms differ between social groups, and both have a significant impact on individuals' behavior (Masson et al., 2016). Here, the most critical question is that in which kind of situations values or norms have more impact on individuals' behavior. In this context, studies are showing that within a particular culture, personal values can differ significantly from individual to individual, and these personal values are of little importance, especially at certain behaviors (Smith, 2017). For example, according to Leung and Morris (2015), norms are more salient when the right behavior is unclear. On the other hand, values are more important when the behavior is private or in a non-identifiable situation. Moreover, according to their study, values are more effective in weak situations with fewer constraints, while norms have a more critical role in situations where social assessment is apparent.

Performance appraisal, which is one of the main elements for functioning organizations, can be affected by contextual factors such as values, norms, attitudes, beliefs, etc. especially considering today's diverse workforce (Cho & Payne, 2016). Accordingly, Adler, Campion, Colquitt, Grubb, Murphy, Ollander-Krane, & Pulakos (2016) showed that contextual factors could considerably affect performance appraisal. Performance appraisal based on faulty values or norms can lead to dissatisfaction and unhappiness among employees (Mishra & Roch, 2017). According to some studies, because people have different values and norms, their perceptions of fairness and justice may differ, and the culture is the main reason for that difference (Ajmal et al., 2017). And other studies show that cultural norms or individual values can affect performance appraisal (Cho & Payne, 2016). Considering that norms and values will be effective on performance appraisals, the related hypothesis is formed as follows:

H_{1a}: Performance scores based on values differ from performance scores based on norms.

Although there are different definitions of trust, it can be broadly defined as a "psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions of the behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998:395). Also, Özer & Zheng (2019:494) defined trust in the context of organizations as follows: "Trust is to behave voluntarily in a way to accept vulnerability due to uncertain behavior of another (the trustee), based upon the expectation of a positive outcome". Establishing trust within an organization can improve areas such as organizational competitiveness, creativity, innovation, teamwork, productivity, and job satisfaction (Kaltiainen et al., 2018). It is safe to assume that trust is a concept that can be deeply affected by culture. Accordingly, Doney, Cannon, & Mullen, (1998) showed the relationship between specific norms and values and trust. According to their study, the chance of building a trusting relationship would be higher when people share the same norms and values. So, assuming that the norms and values would affect the trust level in employees, the hypothesis is formed as follows:

H_{1b}: Trust level in employees based on values differ from trust level in employees based on norms.

Helping behavior, which is one of the organizational citizenship behaviors that is considered vital for organizations to work effectively, is an element that strengthens the relationships among employees (Fischer et

al., 2019). Although it is not included in the employees' job description, helping behavior is performed without any apparent rewards. The importance of helping behavior has been stated by studies that show it can positively affect task performance, career advancement, turnover intention, etc. (Bergeron, Shipp, Rosen, & Furst, 2013; Yoon & Farmer, 2018). It is accepted that cultural values and norms can affect individuals' willingness to help. However, many factors, such as self-reward and empathy, influence individuals' helping behaviors. The social norm that states that those who need help should also be helped an essential factor (Staub, 1974). Also, individuals' value structures such as cooperators, individualists, or competitors can affect their helping behaviors (McClintock & Allison, 1989). Considering the effects of values and norms on individuals' helping intention, the related hypothesis is formed as follows:

H_{1c}: *Helping intention level based on values differ from helping intention level based on norms.*

Ingroup vs. Outgroup

People, who are social beings, are included in a particular group in today's social world, and they classify other individuals they interact with into specific groups. Therefore, groups play an essential role in the creation of human societies (Varga, 2018). People tend to belong to a group as an instinct because of their nature. The group they belong to has a vital role in forming their personality and determining their behavior. On the other hand, the exclusion of an individual from a group can cause some psychological and physical problems (Varga, 2018; Yang, Wei, Zhao, & Liu, 2017). A person who considers himself/herself a part of a group causes those who are not included in that group to be categorized as outgroup. Here, groups can be based on many different factors, including gender, family, religion, ethnic elements, etc. When groups are formed and individuals are classified according to these groups, people are no longer seen as individuals but as a part of that group (Rabinovich, Morton, Postmes, & Verplanken, 2012). Because of the nature of the group relationships, ingroup favoritism is widespread in social groups. While people treat other groups' members preferably, they can act discriminately to people who belong to different groups (Pan & Houser, 2013). A series of studies led by Tajfel in the early 1970s provided strong evidence favoritism towards ingroup and discrimination towards those identified as outgroup (Yamagishi, Jin, & Miller, 1998). This disposition is defined as "positivity toward the ingroup and negativity toward outgroups" (Brewer, 2016:91).

The general view in performance appraisal is that raters will give higher scores to the employees that belong to their group, while lower scores to outgroup employees. Studies are showing that raters can make favorable evaluations towards the ingroup employees and unfavorable evaluations against those in the outgroup (Smith et al., 2001). For example, in a study conducted on bank employees, it was observed that although they showed a similar performance according to objective performance indicators, the ingroup employees received higher performance scores than the outgroup employees (Cook, 1995). There can be different psychological reasons behind the ingroup favoritism, such as favorable beliefs about ingroup, dehumanization of outgroup members, etc. (Hughes, Ambady, & Zaki, 2017). On the other hand, contrary to expectations, expectancy violation theory suggests that underperforming ingroup individuals can be evaluated with lower scores (Roberson, Galvin, & Charles, 2007). Based on these explanations, the relevant hypothesis is formed as follows:

H_{2a}: *Performance scores towards ingroup employees differ from performance scores towards outgroup employees.*

Some studies have shown that although trust levels vary in different cultures, individuals in the same group trust each other more (Fulmer & Gelfand, 2015). Experiments conducted within the scope of trust games and ultimatum games also reveal that ingroup individuals are more trusted (Zuo, Chen, & Zhao, 2018). Also, due to the positive prejudices against ingroup members in general, a sense of trust can be built more comfortably against individuals in the same group (Kaltiainen et al., 2018). In an organizational environment, trust relationships at the

group level can exist, especially in large organizations. It is possible that the division as ingroup and outgroup would affect both top-down and horizontal relations. Based on these explanations, the relevant hypothesis is formed as follows:

H$_{2b}$: Trust level towards ingroup employees differ from trust level towards outgroup employees.

Social identity theory (Tajfel & Turner, 1979) argues that helping ingroup positively affects one's well-being while helping outgroup has no positive effect or even sometimes has a negative effect. Studies conducted across different group identities show that ingroup bias is a prevalent phenomenon free from gender, race, religion, culture, etc. (Johnson, Rowatt, & Labouff, 2012; Kwak, Kwon, Yun, Jeong, & Huettel, 2018). Accordingly, several studies have shown that being ingroup or outgroup plays a vital role in helping behavior (Levine, Prosser, Evans, & Reicher, 2005; Smith, 2017). However, there are also studies showing no significant relationship between ingroup and outgroup in the context of helping intention. There may be different reasons behind helping intention, such as the perception of us vs. them, having similar cultural values, or empathy (Stürmer, Snyder, Kropp, & Siem, 2006). In this study, we are expecting a significant relationship between helping intention and being ingroup or outgroup; therefore, the related hypothesis is formed as follows:

H$_{2c}$: Helping intention level towards ingroup employees differ from helping intention level towards outgroup employees.

High-Power vs. Low-Power

The concept of power, which has different definitions in the literature, is generally defined as the ability to get people to do things they would not otherwise do (Lee & Tiedens, 2001:44). On the other hand, in organizations, power is a concept that indicates to what extent a person can determine outcomes about himself/herself or other employees. People who have a specific management capacity within an organization can influence the employees' positions and behaviors by controlling the resources and administrative penalties. Because of that, the concept of power can affect both interpersonal relations and work-related behaviors of individuals working in a particular social environment (Smith & Bond, 2019). Also, people with high-power have low accountability for their behavior within the organization (Gelfand & Harrington, 2015). The concept of power, including the control of rewards and punishments about employees, can also affect performance appraisals (Ferguson et al., 2010). Such employees with high-power can make negative evaluations more easily because of their low accountability (Schmid & Schmid Mast, 2013). Besides, the sense of responsibility that comes with power can cause them to evaluate low performance more harshly (Ferguson et al., 2010). So, the hypothesis is formed as follows:

H$_{3a}$: Performance scores given by high-power individuals differ from performance scores given by low-power individuals.

Trust, also, is related to the number of interconnections with other individuals. Such that, the relations of high-power individuals are more interdependent compared to low power individuals (Lee & Tiedens, 2001). Creating and maintaining such relationships is directly related to the concept of trust. After a series of experiments, Schilke, Reimann, & Cook (2015) found that people with high-power feel less trusting of others than people with low-power. Thus, the related hypothesis is formed as follows:

H$_{3b}$: Trust level of high-power individuals differ from trust level of low-power individuals.

Studies state that individuals with high-power can better analyze the people around them (Overbeck & Park, 2001) and show higher interpersonal sensitivity (Schmid Mast, Jonas, & Hall, 2009). Some studies reveal that the power level can be effective in helping intention towards others (Nadler, 2002). Besides, high-power employees

would show some effort to maintain their relationships and friendships within the workplace to preserve their power. It can cause them to help others more readily. The perception of responsibility that comes with power can, too, affect individuals' helping intention and cause people with high-power to be more open to helping (Yoon & Farmer, 2018). So, the hypothesis is formed as follows:

H_{3c}: Helping intention level of high-power individuals differ from helping intention level of low-power individuals.

The study also examined the dual effects of independent variables on dependent variables, performance scores, trust level, and helping intention. The hypotheses regarding these relations are as follows:

H_4: Values/norms affect the relationship between ingroup/outgroup and a) performance scores, b) trust level, and c) helping intention level.

H_5: Values/norms affect the relationship between power level and a) performance scores, b) trust level, and c) helping intention level.

H_6: Power level affects the relationship between ingroup/outgroup and a) performance scores, b) trust level, and c) helping intention level.

3. Methodology

A scenario-based experimental method with a 2x2x2 factorial design was used to test the hypotheses. In the scenarios, values compared to norms, being ingroup compared to being outgroup, and high-power compared to low-power were manipulated as independent variables of the study. The scales, intention to help, trust in the employee, and performance appraisal, were adapted from previous studies in the literature as dependent variables.

The four helping intention items of the Organizational Citizenship Behavior Intention Scale developed by Williams and Shiaw (1999) and used by Poon, Rahid, and Othman (2006) in their studies were used to measure the intention to help. A sample item is "A colleague has to meet a few deadlines within the same period of time and needs help with his/her workload. Your workload is lighter. How likely are you to help him/her?". This scale's responses were gathered using Likert-type scales from 1 (very unlikely) to 5 (very likely).

To measure the trust in the employee, the trust scale consisting of four items developed by Mayer and Davis (1999) and used by Brower, Lester, Korsgaard, & Dineen (2009) in their studies was used. Sample items from the scale used are as follows: "I would be comfortable giving my employee a task or problem which was critical to me, even if I could not monitor his/her actions" and "I really wish I had a good way to keep an eye on my employee." The responses were collected by 5-point Likert-type scales from 1 (strongly disagree) to 5 (strongly agree). Lastly, to determine the performance appraisal scores given to the employee, the participants were asked to evaluate the employee at a 10-point evaluation scale from 1 (completely unsuccessful) to 10 (excellent).

4. Reliability and Validity Tests

Confirmatory factor analysis was performed using the AMOS 23 to test the validity of the dependent variables used in the study. Conformity indicators obtained via the analysis are satisfactory (Hu & Bentler, 1999): CFI = 0.965, GFI = 0.962, AGFI = 0.928, RFI = 0.926, NFI = 0.950, TLI = 0.948, IFI = 0.965, RMSEA = 0,075. Cronbach's alpha values were examined for the reliability test, and the values of 0.842 and 0.815 were determined for the helping intention scale and the trust scale, respectively (Churchill, 1979; Hair, Black, Babin, & Anderson,

2010). AVE values of the scales were calculated for convergent validity, and it was seen that these values were greater than 0.5.

For discriminative validity, the average variance extracted (AVE) values of the scales were compared with the square of the correlation between the scales (0.193). The fact that AVE values are greater than the square of the correlation coefficient indicates that the discriminative validity is ensured (Fornell & Larcker, 1981). The factor loadings are given in the Table 1 below.

Table 1. Factor Loadings

	Loadings	Mean/SD
Helping Intention Level (AVE=0.57)		
HI-1	0.773	3.33/0.973
HI-2	0.784	2.85/0.932
HI-3	0.741	2.65/1.04
HI-4	0.731	3.63/0.936
Trust Level (AVE=0.53)		
T-1	0.737	3.1/1.068
T-2	0.804	2.83/1.162
T-3	0.639	2.79/1.033
T-4	0.713	3.19/1.097

5. Manipulation and Realism Tests

Some manipulation and realism questions were asked to test whether the manipulations used in the scenarios were perceived correctly and realistically by the participants. Examples of the manipulation questions used in the study are as follows: "Ms. Nurdan was recruited with the reference of Mr. Ekrem, one of the school managers," "Scoring Ms. Nurdan's performance is an activity that makes you feel powerful." When the manipulation questions are examined, it can be seen that the participants correctly understand the manipulations. The first two control questions were asked as true/false; respectively, 408 and 401 participants out of 427 participants gave correct answers. The number of participants who gave correct answers to both of the two questions is 393. Data of 34 people who gave incorrect answers to at least one of the first two control questions were not included in the analyzes. The third control question asked as a 5-point Likert-scale also showed the validity of the manipulation ($M_{high\_power} = 3.94 > M_{Low\_power} = 2.99$, $p<0.001$).

To measure the scenarios' realism, a test consisting of two questions developed by Dabholkar (1994) was used. These questions are as follows: "The situation described in the scenario is realistic" and "I can see myself in the situation described in the scenario." The average of the answers given to the realism questions asked as 7-point Likert-scale is satisfactory (M=5.41, SD=0.961).

6. Results

While 244 of the study participants (62.1%) were male, 302 (76.9%) had undergraduate or postgraduate education. While 50 (12.7%) of the participants are unemployed, 182 (46.3%) are not in managerial positions. The average age of the participants in the study is 31.89 (SD=7.335, min=18, max=60).

Table 2. Descriptive Statistics and Correlations

	Mean	Std. Dev.	1	2	3
1. Performance Score	4.43	1.632	1	0.612***	0.310***
2. Helping Intention Level	3.11	0.800		1	0.145**
3. Trust Level	2.98	0.875			1

As shown in the Table 2 above, there is some degree of linear relationships among the dependent variables examined in the study. Mainly, a strong relationship was found out between performance scores and helping intention. Also, there is a moderate relationship between performance appraisal scores and trust level in the employee, while there is a weak relationship between helping intention and trust level.

The above hypotheses were tested with the help of the Univariate General Linear Model. The results obtained are as follows (see Table 3):

Table 3. Results of Tests (F Values)

	Performance Score	Trust Level	Helping Intention Level
Culture (Value/Norm)	29.180***	26.323***	154.189***
Group (Ingroup/Outgroup)	13.928***	2.486	7.884**
Power (High-Power/Low-Power)	8.289**	212.003***	8.738**
Culture x Group	0.042	1.167	4.807*
Culture x Power	18.121***	11.782**	5.997*
Group x Power	1.044	15.873***	0.005
Culture x Group x Power	0.552	1.964	2.821

According to the results obtained, H_{1a} (Fig. 1), H_{1b} (Fig. 2), and H_{1c} (Fig. 3) were accepted. The performance scores and helping intention level of the respondents who answered the questions according to values are higher than those who answered according to norms. On the other hand, the trust level of respondents of the value scenario is lower.
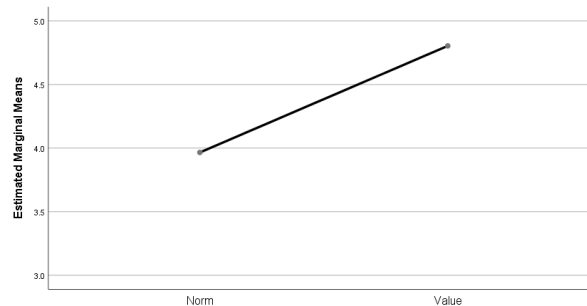
Figure 1. Performance Scores (Value vs. Norm)
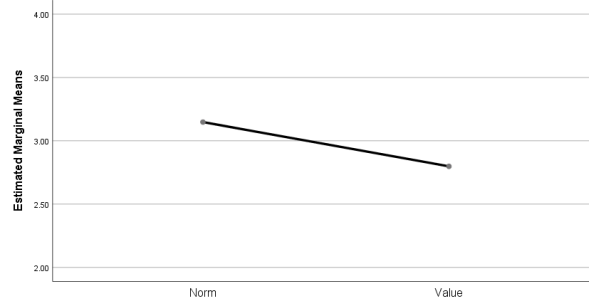
Figure 2. Trust Level (Value vs. Norm)
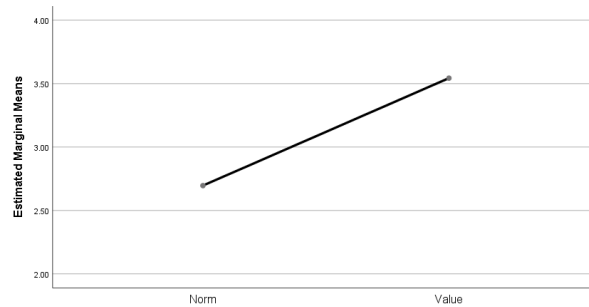
Figure 3. Helping Intention Level (Value vs. Norm)

Moreover, H_{2a} (Fig. 4) and H_{2c} (Fig. 6) were accepted, but H_{2b} (Fig. 5) was rejected. The performance scores given to the ingroup employees and helping intentions towards ingroup employees are higher than outgroup employees. Conversely, there is no relationship between trust in employees and being ingroup or outgroup.
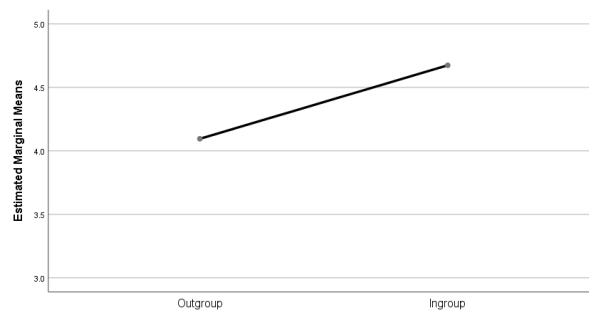
Figure 4. Performance Scores (Ingroup vs. Outgroup)
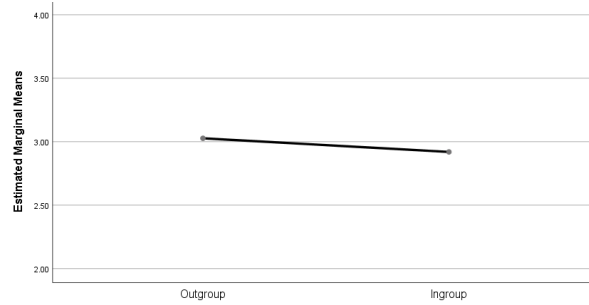
Figure 5. Trust Level (Ingroup vs. Outgroup)
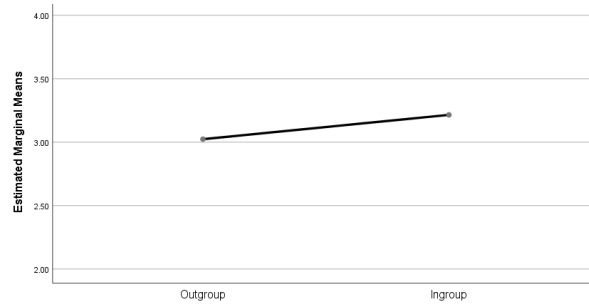
Figure 6. Helping Intention (Ingroup vs. Outgroup)

Also, H$_{3a}$ (Fig. 7), H$_{3b}$ (Fig. 8), and H$_{3c}$ (Fig. 9) were accepted. Those with high power gave lower performance scores and indicated lower helping intentions and trust levels towards employees than those with low power.
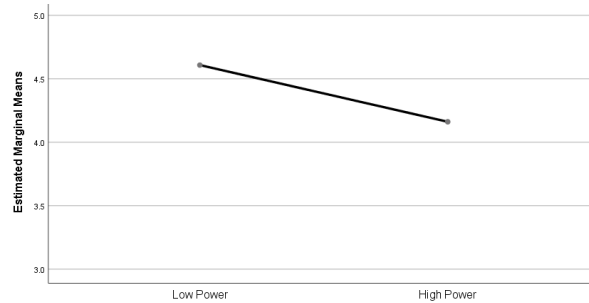
Figure 7. Performance Scores (High-Power vs. Low-Power)
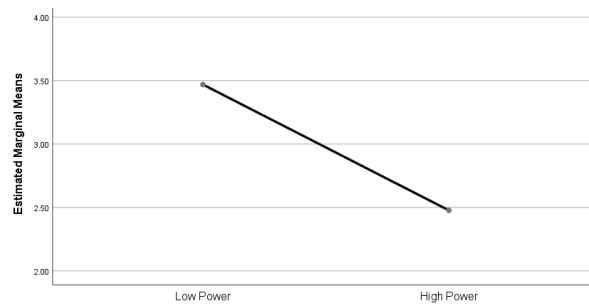
Figure 8. Trust Level (High-Power vs. Low-Power)

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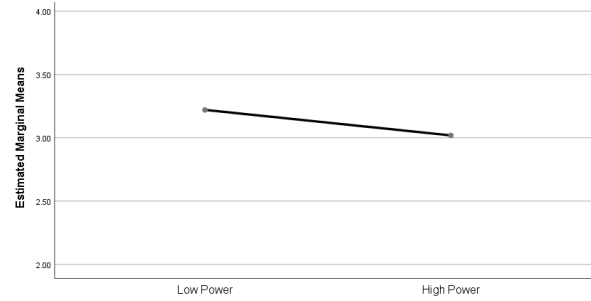
Figure 9. Helping Intention (High-Power vs. Low-Power)

When we examine H_4 (Fig. 10, 11, 12), we can see that only H_{4c} was accepted. According to results, the relationship between being ingroup or outgroup and helping intention changes with values and norms. As shown in Fig. 12, helping intention level is higher for ingroup than outgroup according to values while it remains relatively still according to norms.
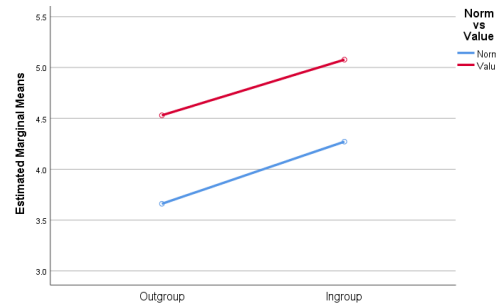
Figure 10. The Effect of Value/Norm and Group on Performance Scores
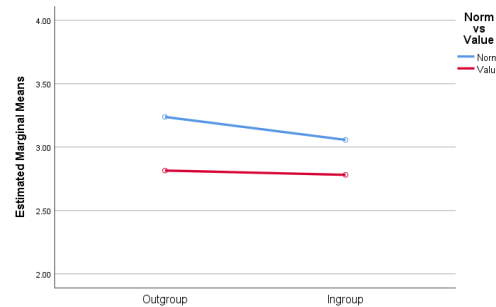
Figure 11. The Effect of Value/Norm and Group on Trust Level

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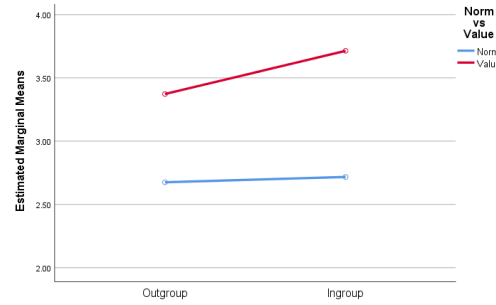
Figure 12. The Effect of Value/Norm and Group on Helping Intention

H_{5a} (Fig. 13), H_{5b} (Fig. 14), and H_{5c} (Fig. 15) were accepted. According to norms, performance scores tend to decrease while power level increases, but according to values, performance scores tend to increase with power level. The decrease in trust level according to value is higher than the decrease in trust level according to the norm. Lastly, while helping intention levels decreases according to norms, it does not change much according to values.
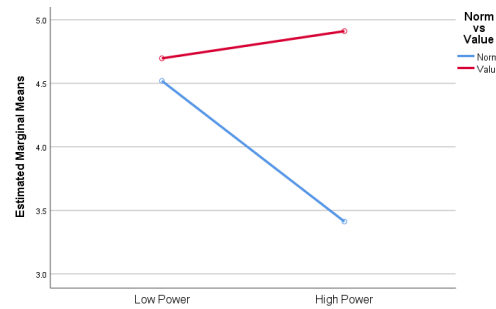
Figure 13. The Effect of Value/Norm and Power on Performance Scores
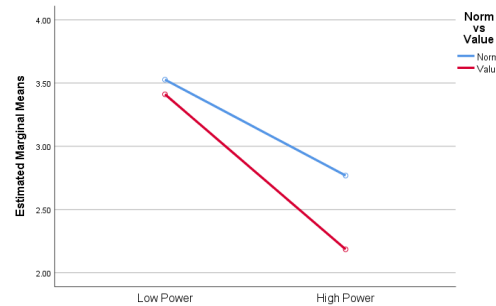
Figure 14. The Effect of Value/Norm and Power on Trust Level
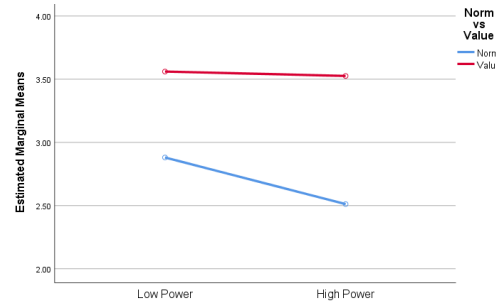
Figure 15. The Effect of Value/Norm and Power on Helping Intention

While H_{6a} (Fig.16) and H_{6c} (Fig.18) were rejected, H_{6b} (Fig.17) was accepted. Contrary to expectations, for high-power people, the trust level towards outgroup is higher than in ingroup. On the other hand, as expected, the trust level towards ingroup is higher than outgroup for low-power people.
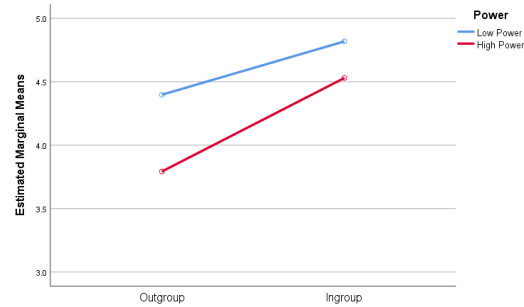
Figure 16. The Effect of Group and Power on Performance Scores
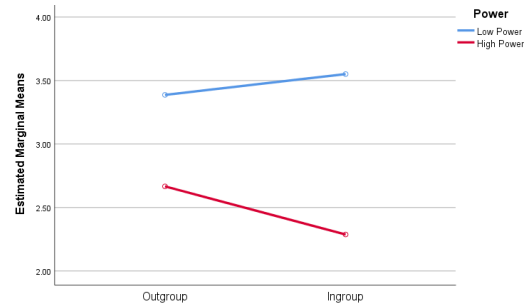
Figure 17. The Effect of Group and Power on Trust Level
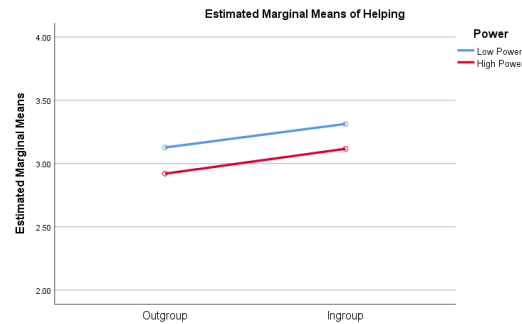
Figure 18. The Effect of Group and Power on Helping Intention

Discussion

The outputs obtained in this study have revealed some crucial results for organizational management that operate in a social environment. The first one is about comparing the performance evaluations based on individual values and the evaluations based on the norms that reflect the general view of the society. Here, it is seen that the performance scores given in the context of values are higher than the performance scores given in the context of norms. While in the scenario, the objective performance score should be 4.00, the average of the evaluations made in the context of norms is 4.05, and the average of the evaluations made in the context of values is 4.81. The numbers show that individuals' evaluations based on their values differ and tend to be higher than norm-based evaluations that show the generally accepted tendency. While the evaluations made in the context of the norm are very close to the objective score, the individuals' scores in the context of their values are higher than the objective score. The regulatory influences brought about by normative pressures may play a role in these numbers (Smith & Bond, 2019).

Similarly, individuals' intention to help level differs according to values and norms. According to results, the helping intention in the context of values is higher than helping intention in norms. Here, the results show that when people act according to their values, they show a higher intention to help than norms. In other words, when the request for help is directly addressed to a specific person, he/she feels more responsible and tends to make an effort beyond expectations. Behind this result, there can be different moral or psychological reasons such as not refusing to help or empathy.

On the other hand, the level of trust towards employees stated according to personal values is lower than the level of trust stated according to norms. This result shows that the level of trust that individuals have towards others is below the normative acceptance. In other words, while the perception generally accepted by society indicates a certain level of trust, this level of trust is lower on an individual basis.

These results reveal that how values and norms affect behaviors, especially in the organization's context, differ from each other. Here, it can be stated that the evaluations made from a norms perspective in performance evaluation are closer to objective results and therefore more realistic.

When the results are examined in the group's context, as expected, it was seen that the performance scores given to the members of the ingroup were higher than the scores given to the members of the outgroup. This result is not surprising when considering ingroup favoritism. This result is in line with many studies in the literature (Chen, Brockner, & Katz, 1998; Cook, 1995; Gomez, Kirkman, & Shapiro, 2000; Smith et al., 2001). When the performance evaluation results are examined, it can be seen that the average of the evaluations towards the outgroup (4.10) is closer to the objective score (4.00) than the average of the evaluations towards the ingroup

(4.71). This situation reveals that the ingroup evaluations are biased and show greater deviations from the actual performance value. Therefore, awareness training can be given to raters about favoritism towards ingroup to obtain more accurate results. It would also be safe to say that more accurate performance results can be obtained by increasing the weight of the evaluations from outgroup members. Similarly, the level of helping intention towards ingroup members was higher compared to outgroup members. This result is also in line with expectations, and many studies in the literature (Fiedler, Hellmann, Dorrough, & Glöckneret, 2018; Levine et al., 2005; Stürmer et al., 2006; Weisel & Böhm, 2015).

Contrary to the expectations, a significant relationship cannot be found between the level of trust towards the employee and being ingroup or outgroup. These results differ from some studies in the literature (Fulmer & Gelfand, 2015; Jones, Wiley, LoPilato, & Dahling, 2020; Zuo et al., 2018). The results obtained show that there is no discrimination for ingroup and outgroup in terms of the trust. Here, the results different from the literature could be based on the nature of the scenario technique. Because the relationships described in the scenarios are fictitious, it is possible that the participants were not able to make their evaluations accurately.

When the results obtained in the context of power are examined, it can be seen that high-power individuals give lower performance scores. Here, the average of the scores given by high-power individuals (4.20) is closer to the objective score (4.00) than the average of the scores given by low-power individuals (4.65). These results align with other studies in the literature (Ferguson et al., 2010; Schmid Mast, Khademi, & Palese, 2020). In their study, Schmid & Schmid Mast (2013) showed that those with high power could make more accurate assessments. Therefore, it is understood that high-power individuals' evaluations should be more critical in the performance evaluations in organizations to provide more accurate results.

Moreover, high-power individuals show a lower level of trust towards employees. The result is similar to the study of Schilke et al. (2015). Those who have higher power naturally have more responsibility, which may cause them to act more cautiously and have less trust in their subordinates. On the other hand, the fact that low-power individuals have a closer rank to the employees may have helped them to feel a closer relationship with them and to have more confidence in them.

Finally, according to our study's findings, high-power individuals show a lower level of helping intention towards employees. Considering that the higher power-holders are in higher positions, it is possible that they consider themselves busier and thus place a lower emphasis on help requests. On the other hand, the fact that people with low power feel closer to the employee requesting help may be a factor that will increase their helping intentions. The result obtained differs from the study of Yoon and Farmer (2018), which states that people with high power are more inclined to help others.

When the two-way relationships of the independent variables in our study are examined, it can be seen that the relationship between being ingroup or outgroup and the helping intention level towards employees does not change in terms of norms but changes in terms of values. Such that, the higher willingness to help ingroup members is valid in the context of values. In other words, the helping intention level towards ingroup or outgroup does not differ in the context of norms. The reason for this may be the feeling of an obligation to act following general acceptance in order not to experience social exclusion and to be exposed to normative pressures.

In addition, the relationship between power and performance scores, trust level, and helping intention level differs according to values and norms. Performance scores tend to decrease from low power to high power in norm-based evaluations, while they tend to increase in value-based evaluations. In other words, while according to the generally accepted opinion, high-power individuals give lower performance scores, it is the opposite in evaluations made according to personal values. Moreover, the relationship between power and trust level

decreases from low power to high power in terms of both values and norms. However, the decrease in the context of norms is higher than the decrease in values.

The relationship between power and helping intention decreases from low power to high power in the context of the norm, while it remains relatively constant in terms of values. In other words, while high-power individuals would help less according to norms, this viewpoint is not reflected in personal values. When we examine the relationship between power and trust level, it can be seen that, as expected, low-power individuals trust ingroup employees more, but contrary to expectations, high-power individuals trust the outgroup more.

Finally, it should not be forgotten that this study is based on the scenario technique. Although the reality and manipulation tests for our study were satisfied, it is still possible that the study participants evaluated the questions without internalizing the relationships mentioned in the scenarios, and this can be one of the limitations of the study. Also, due to the scarcity of studies comparing values and norms in the context of our study's dependent variables, this study can be considered a preliminary study in this field, and the findings of our study should be supported with other similar studies. While this study reveals the relationship between the dependent and independent variables of the study, it is believed that it will inspire further studies that will examine the causality behind the results found.

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Adem BALTACI is an Associate Professor in the Faculty of Political Sciences in İstanbul Medeniyet University. He received a BA degree in Public Administration from Istanbul University in 2002, a Master Degree in Management and Organization from Marmara University in 2003, and a Ph.D. degree in Business Management from Sakarya University in 2009. His fields of interest include human resources management, performance appraisal, and intercultural organizational behavior. He has many published papers in various journals related to these fields.
ORCID ID: https://orcid.org/0000-0001-8474-2164

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STRATEGIC DIRECTIONS FOR INCREASING THE GROSS VALUE ADDED OF THE HIGH-TECH SECTOR (ON THE EXAMPLE OF THE UKRAINIAN ECONOMY)[*]

Borys Burkynskyi [1], Olga Iermakova [2], Oleksandr Laiko [3]

[1,2,3] *Institute of Market Problems and Economic & Ecological Research of the National Academy of Sciences of Ukraine, Frantsuz'kyy Blvd., 29, Postal code 65044, Odessa, Ukraine*
[2] *Odessa National Economic University, Preobrazhens'ka St, 8, Odesa, Ukraine*

E-mails: [1]burkinskij@nas.gov.ua; [2]impeer@ukr.net; [3]alexlayko@gmail.com

Abstract. The article presents the results of research devoted to the development of conceptual and methodological bases for determining strategic directions for increasing the gross value added of the high-tech sector of the national economy, in particular, the modern role of high-tech and science-intensive sectors in economic development and the structure of the high-tech sector of the national economy are studied, the state of the high-tech sector of the Ukrainian economy and its gross value added are analysed, the types of economic activity of the high-tech sector are classified into strategic groups, strategic directions for increasing the gross value added of the high-tech sector of the Ukrainian economy are determined. The improved methodological approach to classifying the types of economic activity of the high-tech sector into strategic groups provides a differentiated approach to the development and reveals the sources of strategic directions for increasing gross value added. Value added and output were selected as classification criteria, taking into account the dynamics of development. Depending on the value added generated by a particular type of economic activity and its growth rate, all types of economic activity can be divided into four groups: strategic leaders, potential leaders, current leaders, and problem sectors. The proposed methodological approach helps to identify the risks from an inertial scenario, that is, the development of the situation by gravity without an appropriate policy, as well as to determine the strategic directions for implementing a progressive scenario. Systematic development of the high-tech sector is possible if the appropriate policy is formed on the basis of the national innovation system, the elements of which are: state regulation in the field of innovation; supply and demand of innovations; market infrastructure for innovations; human resources. According to these elements, the policy measures aimed at increasing the gross value added of economic activities of the high-tech sector, which have their own characteristics depending on the classification group, are systematized.

Keywords: gross value added; high-tech sector; strategic directions

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1. Introduction

The high-tech sector plays a crucial role in the socio-economic development of the world's states and is a key factor in their competitiveness. Ukraine is a state with a strong scientific and innovative potential, which is able to provide access to the world's leading positions. However, Ukraine lags significantly behind in the development of its high-tech sector from many other countries of the world, which requires the development of strategic measures to overcome the current situation. It is analysed the state of the high-tech sector of the Ukrainian economy and its gross value added, which allowed to determine the directions of development.

The methodological approach proposed in the article to determine the types of strategic approaches to the development of the high-tech sector of the national economy contributes to the development of differentiated measures for the types of economic activity of this sector, depending on what added value they generate and what importance they have in the total output, considering the dynamics of development.

In order to ensure the systematicity of measures to increase the gross value added of the high-tech sector, a comprehensive application of appropriate tools and mechanisms to all elements of the national innovation system is proposed.

The purpose of the research is to study the high-tech sector in context of gross value added and determine strategic directions for its increase.
Tasks:
- to analyse the state of the high-tech sector of the Ukrainian economy and its gross value added;
- to develop a classification of economic activities of the high-tech sector by strategic groups;
- to determine strategic directions for increasing the gross value added of the high-tech sector on the example of the Ukrainian economy.
Object of the research**:** strategic development of the high-tech sector of the national economy.
Subject: theoretical, methodological and applied bases for determining strategic directions for increasing the gross value added of the high-tech sector of the national economy.
The research puts forward the following **hypotheses**:
1. High-tech sector contributes to the country's economic development.
2. High-tech sector is developing dynamically in the world and in Ukraine.
3. Ukraine has the potential to develop a high-tech sector.
4. Determining the directions of increasing the gross value added of the high-tech sector requires classifying economic activities into strategic groups.
5. Systematic development of the high-tech sector is possible if the appropriate policy is formed based on the national innovation system.
The methodological tools of the research include:
- determination of the industry structure of the high-tech sector;
- parameters of gross value added of the high-tech sector;
- improvement of the methodological approach to the classification of economic activities by strategic groups;
- systematization in the context of: "strategic groups of economic activities – risks – strategic directions of the progressive scenario - measures".

International organizations, in particular the United Nations Industrial Development Organization (UNIDO), the Organization for Economic Cooperation and Development (OECD), the National Science Foundation, the World Economic Forum, Cornell University, INSEAD and WIPO, study high-tech sectors issues.

There were researched the studies of high-tech industries transformations on the basis of a value-added approach in different countries and analyzed their experience for Ukrainian realities, among other there are Cenrtal and Eastern Europe economies (Olczyk et. al. 2017, Rojicek 2007), OECD countries (Ceglowski 2015), EU countries (Parker 2000). It also were researched the value added chains within multinational high-tech corporations (Larsen et al. 2018). An important issue remains the interpretation of the factual material of international and national organizations and the countries' experience in the aspect of developing strategic directions for the development of the high-tech sector of the Ukrainian economy, which this research is devoted to.

The novelty of the obtained results is the developed methodological approach to the classification of economic activities of the high-tech sector by strategic groups (strategic leaders, potential leaders, current leaders and problem activities) depending on the generated added value and their output considering the development dynamics, that provides a differentiated approach and reveals the sources of strategic directions for increasing the gross value added. Systematic development of the high-tech sector is possible if the appropriate policy is formed based on the national innovation system, failures of this policy are considered as limitations of the research.

2. The current role of high-tech and science-intensive sectors in economic development

High-tech and science-intensive industries play a leading role in the development of the country's economy and social sphere. They materialize the main part of the results of scientific and technical (experimental) developments; they determine the demand for scientific achievements and create the basis for the supply of key technologies for all other sectors of the economy. The size of the high-tech sector and the scale of use of high technologies characterize the scientific, technical and economic potential of the country. The development of high-tech industries is crucial for the country's economic development. The transition to the production of high-tech products is accompanied by a decrease in the material and energy intensity of production, an increase in labour productivity and, consequently, an increase in the country's competitiveness. Today, it is indisputable that the high-tech production is the main factor in increasing employment and salaries.

The importance of high tech and science-intensive industries for the economic growth is determined by the following:

– at the enterprises of these industries more intensive innovation activities are carried out, which contributes to the expansion and creation of new sales markets and more efficient use of resources. The number of innovatively active industrial enterprises in high-tech sectors in Ukraine in 2019 was 34.8% of the total number of industrial enterprises, and the number of enterprises in these sectors that introduced innovations (products and/or technological processes) was 35% of the total number of industrial enterprises;

– a high share of value added in the volume of manufactured products contributes to the higher employment and remuneration of employees;

– the results of scientific and technical (experimental) developments implemented in high-tech and science-intensive sectors contribute to the accelerated development of other sectors of the economy;

– technological progress and innovation are a necessary prerequisite for the process of neoindustrialization, which, in turn, determines development. This idea is supported by Sustainable Development Goal No.9, which calls for "Creation of flexible infrastructure, promotion of inclusive and sustainable industrialization, and encouragement of innovations". Technology contributes to the achievement of goals in all three dimensions of sustainable development (economic, social and environmental). In particular, technology has an impact on reducing the consumption of non-renewable resources and the share of pollution per unit of production by improving energy efficiency, resource efficiency, pollution prevention and reduction, and waste recycling;

– global markets for high-tech goods and services are growing at a faster pace, which opens up new opportunities for domestic exports. In addition, new technologies create new markets, such as technologies for recycling and re-use of waste; bringing new and better products to the market (smart TVs, smart watches, home management devices, etc.);

– improvement of production efficiency through digitalization and interconnection of production processes.

The latest technological achievements form the next stage of progress – the Fourth Industrial Revolution. Its concept is based on the growing convergence of various new technological industries: digital manufacturing, nanotechnology, biotechnology and the development of new materials and their complementarity in manufacturing. Advanced digital manufacturing technologies are the result of a combination of three main components: hardware, software, and communication tools. The equipment includes tools and auxiliary systems of modern industrial robots and "smart" automated systems, as well as collaborative robots (robots that perform tasks together with humans) and 3D printers for additive manufacturing. This set of production equipment technologies is in many ways similar to the technologies of the previous stage – the Third Industrial Revolution. The distinctive features of the new machines are their means of communication, as well as flexibility and functionality in performing production tasks.

Advanced digital manufacturing technologies can increase a firm's profits and use of capital, better integrate labour into production, and improve environmental sustainability. The introduction of these technologies into industrial production requires additional support from other sectors of the economy, in particular, high-tech services that provide IT and digital solutions necessary for the implementation of "smart" production. Such interaction with services can potentially increase the multiplier effect of industrial production on job creation and poverty reduction, as well as open up new opportunities for countries to develop production (UNIDO 2019).

3. Structure of the high-tech sector of the national economy

It is important to note that the high-tech sector of the economy consists of the sphere of high-tech material production and the sphere of providing high-tech services. In the EU countries, the definition of high-tech industries is based on the criteria of R. Butchart, developed in 1987 (Butchart 1987). He followed a quantitative approach based on two main indicators: the level of R&D spending in sales and the share of scientists, engineers and technicians in the total number of employees in the industry. Later, this approach was first adapted to NACE Rev.1, then to NACE Rev.2 (OECD 2011). High-tech sector of the national economy according to the domestic classifier KVED-2010 (Classification of types of economic activity), considering the classification of NACE Rev.2 is shown in Table 1.

Table 1. Sectoral structure of the high-tech sector of Ukraine by type of economic activity (KVED-2010)

High-tech sector of the national economy			
KVED code	High-tech material production sphere	KVED code	Sphere of high-tech services provision
C20	Production of chemicals and chemical products	J58 – J60	Publishing activities; film, videos, TV shows production, sound recordings publications; radio and television broadcasting
C21	Production of pharmaceutical products	J61	Telecommunications (electrocommunication)
C26	Production of computers, electronic and optical products	J62 – J63	Computer programming, consulting and provision of information services
C27	Production of electrical equipment	M72	Research and development
C28	Production of machinery and equipment		
C29	Production of motor vehicles, trailers and semi-trailers		
C30	Production of other vehicles		
C32.5	Production of medical and dental instruments and materials		

Source: Prushkivska et. al. 2019

The analysis of the high-tech sector of the national economy in this research will be carried out in the context of gross value added. The statistical approach reflects the features of macroeconomic accounting for value added based on the system of national accounts. The international standard sectoral classification of all types of economic activity defines gross value added as the difference between the cost of output in basic prices and the cost of intermediate consumption (Peshina et.al. 2013). The term "gross" means that the added value includes the amount of consumption of fixed capital. The State Statistics Service of Ukraine describes gross value added as the difference between output and intermediate consumption; it includes primary income created by production participants and distributed among them. At the same time, the indicator of gross value added by type of economic activity is calculated as the amount of remuneration of employees, other taxes with the exception of other subsidies related to production, and gross profit (mixed income) (Nikishyna 2017).

4. Analysis of the state of the high-tech sector of the Ukrainian economy and its gross value added

The United Nations Industrial Development Organization (UNIDO) estimated that the top 10 economies account for 90% of all patents issued worldwide and 70% of all exports and 46% of digital technology-related imports. These countries include the United States, Japan, Germany, China, Taiwan, France, Switzerland, the United Kingdom, South Korea, and the Netherlands. Another 40 countries are classified as the followers who are actively working with these technologies, although much less intensively. In the rest of the world, there is very low activity (late economies) or a complete lack of participation in the global development and use of these technologies (lagging economies). Ukraine is classified as a country that is late, but participates in the production of digital technologies (UNIDO 2019).

Analysis of statistical data on the gross value added of the high-tech sector of the world economy and Ukraine in 2002-2018 showed the presence of the following trends:
−   the growth of Ukraine's share in the global gross value added of the high-tech sector in 2018 compared to 2002 – 0.08 percentage points. However, in general, this share is insignificant – 0.15% in 2018;
−   correspondence of the share of gross value added of the high-tech sector in GDP in Ukraine and in the world – 10.4% in 2018;
−   the growth rate of gross value added of the high-tech sector of Ukraine is higher than the global indicator;
−   analysis of GDP growth rates and gross value added of the high-tech sector in the world and in Ukraine (Figure 1, 2) showed that their dynamics coincide with a slight excess of the growth rate of gross value added of the high-tech sector. This is explained by the effect of delayed development of the high-tech sector in relation to traditional ones, associated with the time lag necessary for implementing results on a general economic scale (Peshina et al. 2013).
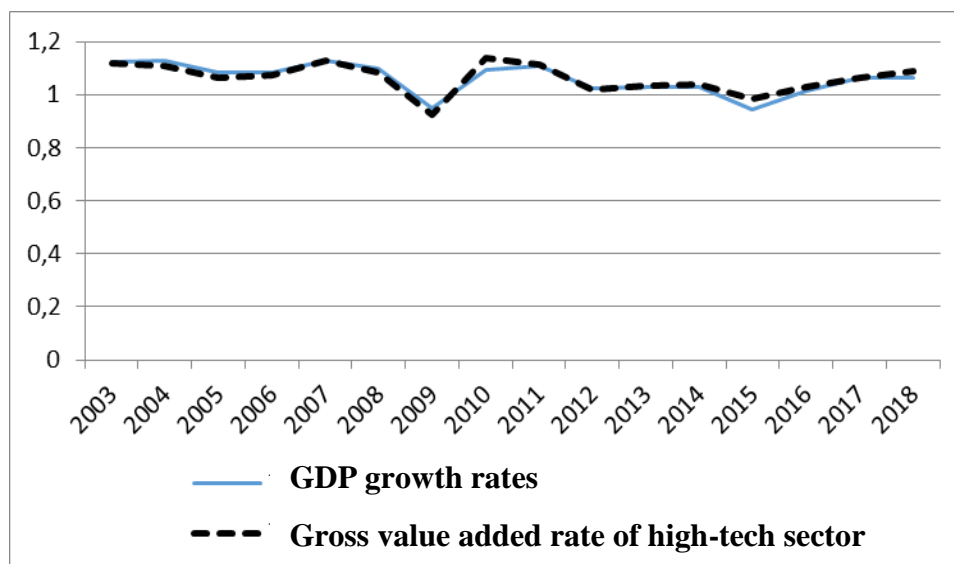
Figure 1. Dynamics of GDP growth and gross value added of the high-tech sector in the world in 2003-2018
Source: calculated by the authors based on data (National Science Foundation 2018)
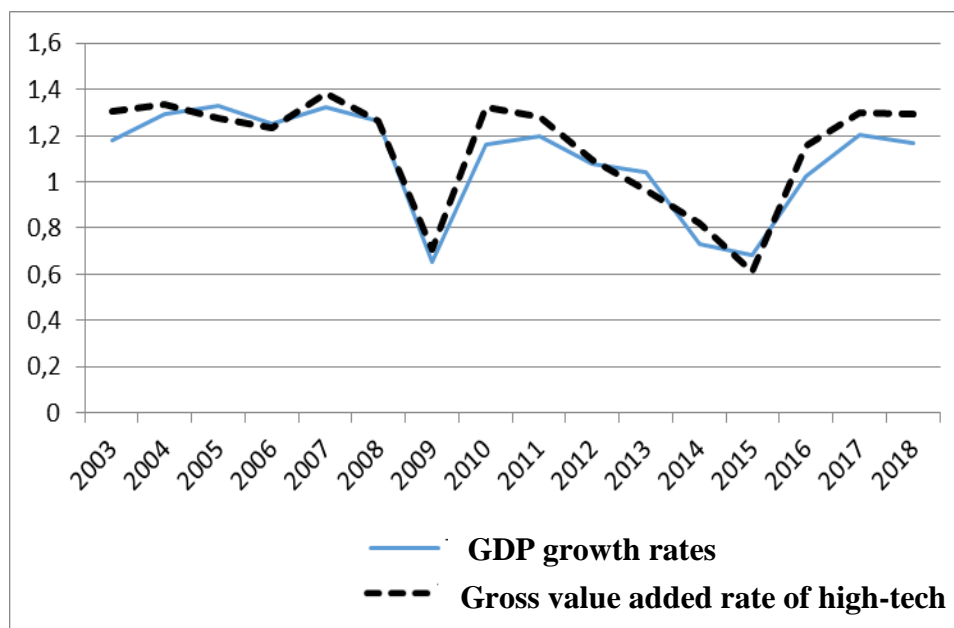
Figure 2. Dynamics of GDP growth and gross value added of the high-tech sector in Ukraine in 2003-2018
Source: calculated by the authors based on data (National Science Foundation 2018)

The analysis of gross value added of the high-tech sector of Ukraine in comparison with other sectors of the economy in the context of structural components is presented in Table 2.

Table 2. Structure of gross value added of the high-tech sector of Ukraine in 2018, %

KVED	Labour remuneration	Production-related taxes	Gross profit
C20. Production of chemicals and chemical products	80.2	1.5	18.2
C21.Production of pharmaceutical products	54.7	0.5	44.7
C26. Production of computers, electronic and optical products	83.3	0.7	16.0
C27. Production of electrical equipment	58.5	0.6	40.9
C28. Production of machinery and equipment	67.2	0.6	33.9
C29. Production of motor vehicles, trailers and semi-trailers	123.5	0.7	-24.2
C30. Production of other vehicles	65.0	0.5	34.5
J58-J60. Publishing activities; production of films and videos, television programs, publication of sound recordings; radio and television broadcasting activities	59.9	1.4	39.7
J61. Telecommunications (electrocommunication)	32.9	0.4	67.7
J62-J63. Computer programming, consulting and provision of information services	31.1	2.4	66.5
M72. Research and development	63.5	0.2	36.6
High-tech sector (total)	**50.1**	**1.2**	**49.1**
Manufacturing sector (processing industry)	**56.2**	**1.0**	**43.3**
Agricultural sector (agriculture, forestry, hunting)	**20.6**	**0.8**	**79.5**
Trade sector (wholesale and retail trade)	**41.5**	**0.9**	**57.6**

Source: calculated by the authors based on data (State Statistics Service of Ukraine 2020)

A characteristic feature of the structure of gross value added in the high-tech sector is the highest values of shares (compared to other sectors) of remuneration and tax deductions, which indicates the realization of economic interests, first, of employees and the state. Consequently, the high-tech sector performs important social and tax functions in the macro-system, ensures the reproduction of the country's labour and intellectual potentials, and is one of the basic resource-forming sectors of the national economy (Nikishyna 2017). The development of the high-tech sector should become one of the priorities of the state economic policy, since the growth of the share of its gross value added will primarily contribute to an increase in jobs, wages and tax revenues, which is due to the structural features of the indicator in this sector.

5. Determination of strategic directions for increasing the gross value added of the high-tech sector of the national economy

Determination of strategic directions for increasing the gross value added of the high-tech sector of the national economy is proposed using the BCG Matrix adapted to the needs of this research. Traditionally, the BCG Matrix is used by enterprises to form a product and competitive strategy. The method of classifying the company's business lines according to the BCG Matrix provides an understanding of the state of the company's products on the market. Of all the variety of factors that characterize the state of products in the market, only two main ones are selected for building the Matrix: sales growth (profitability) of the product and its market share relative to the main competitors. After all, a product can make a small profit in a fast-growing market, and a highly profitable product can be obsolete.

It is proposed to determine the strategic directions for the development of the high-tech sector in the context of the types of economic activity that form it.

There are examples of applying the BCG Matrix to the classification of types of economic activity of the country's economy as a whole (Institute of Socio-Economic Research 2016), where the added value generated by a particular type of economic activity and the share in the total export volume are chosen as criteria. This approach

provides an understanding of the prospects of economic activities, depending on their significance for the economy and on their export orientation.

The methodological approach proposed for this research value-added and output as classification criteria, considering the dynamics of development. Depending on value added generated by a particular type of economic activity and its growth rate, all types of economic activity can be divided into four categories (groups): strategic leaders (I quadrant), potential leaders (II quadrant), current leaders (IV quadrant) and problem activities (III quadrant) (Figure 3). On the abscissa axis, the high-tech economic activities are located in accordance with the share of gross value added in output, adjusted by the subsidy coefficient (formulas 1, 2) (Institute of Socio-Economic Research 2016).

$$GVA'_i = \frac{GVA_i}{X_i} * S_i \quad , \tag{1}$$

where GVA'_i is an adjusted indicator of gross value added of a certain type of economic activity i,

GVA_i is a gross value added of a certain type of economic activity i,

X_i is an output by a type of economic activity i,
S_i is a subsidy coefficient.
To exclude from priority those types of economic activity that receive subsidies, it is proposed to multiply them by the subsidy coefficient, which has indicators below one, or 1 - if there are no subsidies.
The subsidy coefficient is calculated using the following formula:

$$S_i = 1 - \frac{sb_i}{SB} \quad , \tag{2}$$

where S_i is a subsidy coefficient,
sb_i is subsidies received by a certain type of economic activity i,
SB is a total amount of subsidies.
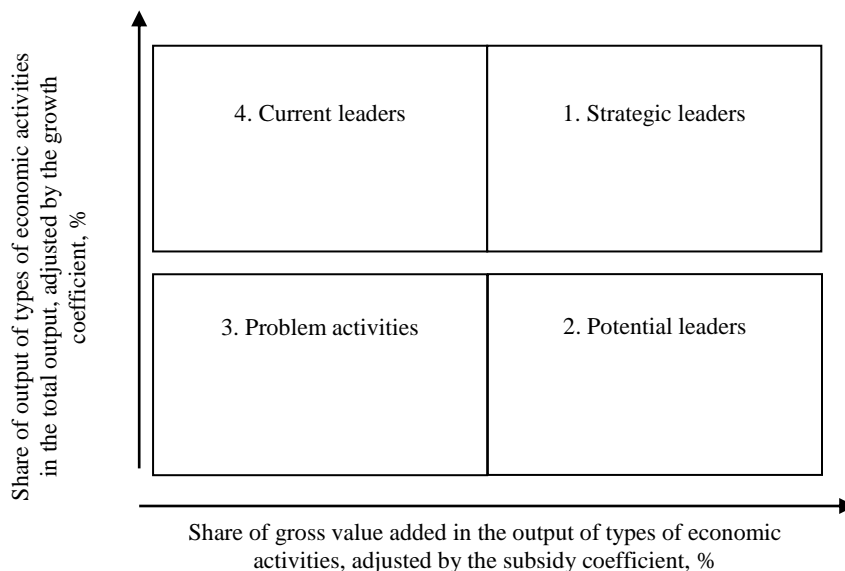
Figure 3. Matrix "Development dynamics – gross value added" and strategic groups of types of economic activities
Source: developed by the authors based on (Institute of Socio-Economic Research 2016)

Indicators of gross value added in output for high-tech economic activities were calculated based on the cost-output tables for 2018 (Tables 3, 4).

Table 3. Calculation of the adjusted indicator of the share of gross value added of the high-tech sector of the Ukrainian economy in the output in 2018

KVED	Gross value added, million UAH	Output, million UAH	Share of gross value added in output structure, %	Subsidy coefficient	Share of gross value added in output structure (adjusted), %
C20. Production of chemicals and chemical products	10 210	88 038	11.6	1.000	11.6
C21. Production of pharmaceutical products	12649	41464	30.5	1.000	30.5
C26. Production of computers, electronic and optical products	5541	18553	29.9	1.000	29.9
C27. Production of electrical equipment	14039	48186	29.1	1.000	29.1
C28. Production of machinery and equipment	23676	75769	31.2	0.980	30.6
C29. Production of motor vehicles, trailers and semi-trailers	7241	29402	24.6	1.000	24.6
C30. Production of other vehicles	19674	57593	34.2	1.000	34.2
J58-J60. Publishing activities; film,videos, TV shows production, programs, sound recordings publications; radio and television broadcasting	12796	36166	35.4	0.994	35.2
J61.Telecommunications (electrocommunication)	37182	68603	54.2	0.982	53.2
J62-J63. Computer programming, consulting and provision of information services	88850	182299	48.7	1.000	48.7
M72. Research and development	22367	30852	72.5	0.997	72.3

Source: calculated by the authors based on data (State Statistics Service of Ukraine 2020)

Table 4. Calculation of the subsidy coefficient for the high-tech sector of the Ukrainian economy in 2018

KVED	Subsidies related to production, million UAH	Share of sector subsidies in the total amount of subsidies, %	Subsidy coefficient
C20. Production of chemicals and chemical products	-	-	1.000
C21. Production of pharmaceutical products	-	-	1.000
C26. Production of computers, electronic and optical products	-	-	1.000
C27. Production of electrical equipment	-	-	1.000
C28. Production of machinery and equipment	405	2.0	0.980
C29. Production of motor vehicles, trailers and semi-trailers	-	-	1.000
C30. Production of other vehicles	-	-	1.000
J58-J60. Publishing activities; production of films and videos, television programs, publication of sound recordings; radio and television broadcasting activities	122	0.6	0.994
J61. Telecommunications (electrocommunication)	370	1.8	0.982
J62-J63. Computer programming, consulting and information services provision	-	-	1.000
M72. Research and development	68	0.3	0.997

Source: calculated by the authors based on data (State Statistics Service of Ukraine 2020)

On the ordinate axis, the types of economic activity of the high-tech sector of the Ukrainian economy are located in accordance with the share in the total output adjusted for the growth coefficient (Table 5).

Table 5. Calculation of the adjusted share of high-tech sector output by type of economic activity in the total output in 2018

KVED	Output in basic prices in 2013, million UAH	Output in basic prices in 2018, million UAH	Share of output of types of economic activities in the total output in 2018, %	Basic growth coefficient 2018/2013	Output share adjusted by growth coefficient, %
C20. Production of chemicals and chemical products	54 257	88 038	1.17	1.623	1.91
C21. Production of pharmaceutical products	13785	41464	0.55	3.008	1.66
C26. Production of computers, electronic and optical products	7719	18553	0.25	2.404	0.60
C27. Production of electrical equipment	22498	48186	0.64	2.142	1.38
C28. Production of machinery and equipment	40274	75769	1.01	1.881	1.90
C29. Production of motor vehicles, trailers and semi-trailers	12493	29402	0.39	2.353	0.92

C30. Production of other vehicles	49013	57593	0.77	1.175	0.90
J58-J60. Publishing activities; production of films and videos, television programs, publication of sound recordings; radio and television broadcasting activities	19851	36166	0.48	1.822	0.88
J61.Telecommunications (electrocommunication)	46222	68603	0.92	1.484	1.36
J62-J63. Computer programming, consulting and information services provision	33196	182299	2.43	5.492	13.36
M72. Research and development	17149	30852	0.41	1.799	0.74
Total in economy	3189558	7493469	100.00	-	-

Source: calculated by the authors based on data (State Statistics Service of Ukraine 2020, 2015)

When determining strategic development directions for the high-tech sector, it is especially important to consider the dynamics of the development of relevant types of economic activity. After all, a particular type of economic activity can at present occupy a small share in the total output, but have a high growth rate, which will help to increase the share of this type of economic activity over time.

Based on the above-mentioned calculations, the types of economic activity of the high-tech sector of the Ukrainian economy are classified into four strategic groups: strategic leaders, current leaders, potential leaders, and problem activities (Table 6).

Indicators of the adjusted share of gross value added and the share of output in the total volume for each type of economic activity of the high-tech sector of the Ukrainian economy were compared with the threshold value (for gross value added – 30%, for output - 1%): if the indicator exceeds the threshold value, it is given a positive sign "+", if it lags behind – a negative sign "–".

The first group of "strategic leaders" usually includes unique innovative sectors that generate high added value, attract highly qualified specialists, have a significant market potential and can ensure a leap in the country's development, bringing it closer to the high-tech economies of the world. These are, in particular, such economic activities as the production of pharmaceutical products; the production of machinery and equipment; telecommunications; computer programming, consulting and information services provision. It should be noted that the production of machinery and equipment, as well as computer programming, consulting and information services provision are export-oriented (the share of these types of economic activity in the total export volume of the country is one of the highest in the high-tech sector – 2.98% and 5.88%, respectively). Ukraine is ranked 9th in the world in terms of exports of ICT services. Telecommunications services, computer and information services account for 23.4% of the total export of services from Ukraine to the EU countries. At the same time, these activities require significant investment, and considering the uniqueness of some of them, are high-risk. Ukraine has the potential to develop these activities of the economy due to the availability of qualified personnel and the education system that can provide it with the main factor of production – human capital. The role of the state in the development of the above-mentioned economic activities should be supportive and implemented through tax incentives for hiring highly qualified personnel and investing in innovations and scientific developments, state guarantees, lending and insurance (Institute of Socio-Economic Research 2016).

Table 6. Classification of the types of economic activity of the high-tech sector of the Ukrainian economy by strategic groups

KVED	Share of the output of the types of economic activity in the total output, adjusted by the growth coefficient, %	Share of gross value added in the output of types of economic activities, adjusted by the subsidy coefficient, %
Strategic leaders (++)		
C21. Production of pharmaceutical products	1.66	30.5
C28. Production of machinery and equipment	1.90	30.6
J61. Telecommunications (electrocommunication)	1.36	53.2
J62-J63. Computer programming, consulting and information services provision	13.36	48.7
Potential leaders (- +)		
C30. Production of other vehicles	0.90	34.2
J58-J60. Publishing activities; production of films and videos, television programs, publication of sound recordings; radio and television broadcasting activities	0.88	35.2
M72. Research and development	0.74	72.3
Current leaders (+-)		
C20. Production of chemicals and chemical products	1.91	11.6
C27. Production of electrical equipment	1.38	29.1
Problem activities (--)		
C26. Production of computers, electronic and optical products	0.60	29.9
C29. Production of motor vehicles, trailers and semi-trailers	0.92	24.6

Source: developed by the authors

The second group – "potential leaders" – includes activities with a high level of added value and low development dynamics, but they have the potential to enter international markets or the potential for import substitution in the domestic market. This group includes such types of economic activities as the production of other vehicles, in particular ships and boats, trains and locomotives, aircraft and spacecraft, as well as parts for these vehicles, related equipment; publishing activities; production of films and videos, television programs, sound recordings; radio and television broadcasting activities, telecommunications; research and development.

Economic activities classified as "current leaders" generate relatively lower value added in the high-tech sector and depend on the price environment of foreign markets. However, today they are competitive in the world market. This group includes the production of chemicals and chemical products; the production of electrical equipment. These economic activities account for 2.9% and 1.9% of export, respectively.

"Problem sectors" are characterized by low development dynamics and produce with relatively low added value. This group includes the production of motor vehicles, trailers and semi-trailers, as well as the production of computers, electronic and optical products.

Strategic directions for increasing the gross value added of the high-tech sector of the Ukrainian economy based on the above-mentioned classification are shown in Table 7. The proposed classification helps to understand the risks from an inertial scenario, that is, the development of the situation by gravity without an appropriate policy, as well as to reveal strategic directions for implementing a progressive scenario. Policy measures aimed at increasing the gross value added of economic activities in the high-tech sector are proposed to be systematized according to the elements of the innovation system: state regulation, supply and demand, infrastructure, human resources.

The proposed methodological approach, based on the classification of economic activities of the high-tech sector into strategic groups, provides a differentiated approach to the development and reveals the sources of strategic directions for increasing gross value added.

Table 7. Strategic directions for increasing the gross value added of the high-tech sector of the Ukrainian economy

Strategic groups	Types of economic activity	Consequences of inertial scenario	Strategic directions of progressive scenario	Possible measures
Strategic leaders	C21. Production of pharmaceutical products C28. Production of machinery and equipment J61. Telecommunications J62-J63. Computer programming, consulting and information services provision	- loss of leading positions; - non-use of export potential	- maintenance and increase of gross value added; - attraction of investment; - integration into global value chains; - export development; - directing the best resources, as these types of economic activity is a stable source of profit	- *state regulation:* creating a favourable investment environment; preferential tax regime for companies that make a profit from the sale of intellectual property; - *demand:* introduction in other sectors of the domestic economy; export support programs; - *supply:* introduction of a program within which private entrepreneurs can use a certain percentage of the amount of their annual tax payments for investing in any innovative enterprises/start-ups; - *infrastructure:* development of venture funds; - *human resources:* introduction of a scheme in which employees become shareholders/participants of companies, at which they work (ESOP), encourages personal interest of employees and business owners in the development of companies and increasing their capitalization.
Potential leaders	C30. Production of other vehicles J58-J60. Publishing activities; production of films and videos, television programs, publication of sound recordings; radio and television broadcasting activities M72. Research and development	- decrease in gross value added due to reduced output	- stimulation of the dynamics of development of these activities; - attraction of investment; - stimulation of demand	- *state regulation:* creation of a favourable investment environment; - *demand:* public procurement; import substitution programs; - *supply:* improvement of the competitiveness of domestic products; - *infrastructure:* science and technology parks, business incubators, clusters, etc.; - *human resources:* internationalization of scientific activity.
Current leaders	C20. Production of chemicals and chemical products C27. Production of electrical equipment	- transformation into problem activities while reducing the dynamics of development	- increase in share of gross value added in the output; - support for high development dynamics	- *state regulation:* stimulation of innovation activity; - *demand:* attraction of foreign investors; import substitution programs; - *supply:* introduction of a program within which private entrepreneurs can use a certain percentage of the amount of their annual tax payments to invest in innovative projects, update/implement technologies; - *infrastructure:* creation of international industrial parks that will connect domestic enterprises with foreign technology developers;

				- *human resources:* creation of international technology centres that contribute to the improvement of technological skills.
Problem sectors	C26. Production of computers, electronic and optical products C29. Production of motor vehicles, trailers and semi-trailers	- reduction or loss of activities	- penetration into specific markets; - improvement of product competitiveness; - increase of sectors profitability	- *state regulation:* stimulation of export activities; - *demand:* development of "smart" production; - *supply:* increase of products competitiveness; - *infrastructure:* creation of cross-sectoral clusters; - *human resources:* creation of international technology centres that contribute to improvement of technological skills.

Source: developed by the authors

5. Conclusions

1. High-tech and science-intensive sectors play a crucial role in the development of countries' economies. In this sector, innovations are created and implemented, new markets and jobs are created, this sector contributes to increase of labour productivity and acceleration of the development of other sectors of the economy, achievement of the Sustainable Development Goals, it forms the Fourth Industrial Revolution, promotes the introduction of advanced digital production technologies, creates new opportunities for production development and neoindustrialization.

2. The structure of the high-tech sector should cover both the sphere of high-tech material production and the sphere of providing high-tech services.

3. Characteristic feature of the structure of gross value added of the high-tech sector is the highest values of shares (compared to other sectors) of remuneration and tax deductions, which indicates the realization of economic interests, first, of employees and the state. Consequently, an increase in the share of its gross value added will primarily contribute to an increase in jobs, wages and tax revenues.

4. The developed methodological approach to classifying the types of economic activity of the high-tech sector into strategic groups provides a differentiated approach to the development and reveals the sources of strategic directions for increasing gross value added. Value added and output were selected as classification criteria, considering the dynamics of development. Depending on the value added generated by a particular type of economic activity and its growth rate, all types of economic activity can be divided into four groups: strategic leaders, potential leaders, current leaders, and problem activities. The proposed methodological approach helps to identify the risks from an inertial scenario, that is, the development of the situation by gravity without an appropriate policy, as well as to determine the strategic directions for implementing a progressive scenario.

5. Systematic development of the high-tech sector is possible if the appropriate policy is formed based on the national innovation system, the elements of which are: state regulation in the field of innovation; supply and demand of innovations; market infrastructure for innovations; human resources. According to these elements, the policy measures aimed at increasing the gross value added of economic activities of the high-tech sector, which have their own characteristics depending on the classification group, are systematized.

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Borys BURKYNSKYI is the Academician of the National Academy of Sciences of Ukraine, Dr. Econ. Sciences, Professor, Director of the Institute of Market Problems and Economic&Ecological Research of the National Academy of Sciences of Ukraine. His scientific works that are dedicated to actual problems of development of national, regional and international economic systems are awarded by with State Premium of Ukraine and his research results has interested Harvard University where Borys Burkynskyi gave open lectures. He is author of more than 300 scientific works, including monographs, research papers in famous Ukrainian and international journals. He is chief editor of 3 scientific journals. Research interests: sustainable development, investment attraction policies, special economic zones, ecologization of economic development, green economy, maritime transport economy, industrial development policies and technological development
ORCID ID: orcid.org/0000-0001-9303-0898

Olga IERMAKOVA is the Doctor of Economics, Professor, Senior Researcher in the Institute of Market Problems and Economic&Ecological Research of the National Academy of Sciences of Ukraine, Professor in the Odessa National Economic University. The total number of publications is more than 135, among them there are articles, published abroad in Japan, Syria, Bulgaria, Poland, Lithuania, Romania and Moldova. Research interests: regional innovation policy, international economy, cross-border cooperation, economic clusters, regional / enterprise competitiveness, strategy for socio-economic and innovation development of regions.
ORCID ID: orcid.org/0000-0002-9815-3464

Oleksandr LAIKO is the Dr. Econ. Sciences, Senior Researcher, Vice-director for scientific work of the Institute of Market Problems and Economic&Ecological Research of the National Academy of Sciences of Ukraine. The total number of publications is more than 170, including monographs, articles published in Ukrainian, Polish, Norwegian, Czech, Lithuanian, Romanian journals. Research interests: investment development of economic systems, capital movement regulation, capital outflow and illicit financial flows research, budgetary and industrial development regional investment policies, mathematical modeling of economic processes, tax policies, spatial development and economy of territorial communities, value added creation and renewal of investments.
ORCID ID: orcid.org/0000-0001-7082-0862

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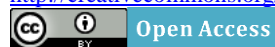
SELECTED DETERMINANTS OF DIGITAL TRANSFORMATION AND THEIR INFLUENCE ON THE NUMBER OF WOMEN IN THE ICT SECTOR[*]

Hana Krchová [1], **Katarína Švejnová Höesová** [2]

[1]*Department of Management and Marketing, Faculty of Economy and Business, Pan-European University, Bratislava, Slovakia*
[2]*School of Economics and Management in Public Administration in Bratislava, Bratislava, Slovakia*

E-mail: [1]*hana.krchova@gmail.com,*[2]*katarina.svejnova@vsemvs.sk*

Abstract. Digital transformation offers a great opportunity for the growth of economies and societies across countries around the world. This digital transformation is leading to very rapid growth in the information and communication technology (ICT) sector. ICT currently faces two main challenges. The first problem is the lack of ICT professionals and the second significant problem is the under-representation of women among them. Our article deals with the issue of the influence of selected factors on the increase of women employed in ICT. In our survey, we focused on the influence of the following factors: The amount of GDP resulting from the ICT sector, the average annual wage, the gender gap, the number of employed women, and the number of women who work in ICT and are educated in ICT. We tested these variables on data from the V4 countries (Czech Republic, Hungary, Poland, Slovakia) for the period 2008-2018. Our aim was to find out whether the mentioned Factors are statistically significant and what is their influence on the number of employed women in the ICT sector so that it is possible to positively influence their amount as much as possible.

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1. Introduction

Current megatrends, such as globalization and digitization, require societies to cope with the so-called "Fourth Industrial Revolution" as the digital and physical worlds come together (Schallmo et al., 2017; Butschan et al., 2019). The Fourth Industrial Revolution is expected to have similar disruptive changes comparable to the introduction of mass production (the Second Industrial Revolution) and the industrial use of information and communication technologies (the Third Industrial Revolution) (Heinze et al., 2017). As a result, companies strive to achieve efficient digital transformation processes to maximize the potential benefits of associated technologies (Laudien and Daxböck, 2016).

Over the decades, digital technologies have changed the way we communicate with others, do business, produce goods and services. They have changed the way we live, work, and spend our free time. This, often rapid, development can have many promises for the future. On the other hand, it is also necessary to think about the other side. In terms of positive challenges, this undoubtedly includes opportunities associated with the possibility of creating wealth, growing technological progress, and improving the quality of life. At the same time, they also present challenges related to possible future threats. We can see them mainly in the lack of current skills, consumer protection, or excessive industrial reorganization. (European Commission, 2015)

It is important to realize that the acceleration of technological innovation has already radically changed the use and behavior of individuals, organizations, and entire market structures. Consumers have really changed the way they choose, buy, and consume the products and services they offer. Digital technologies, such as mobile technologies, collaborative technologies, and the Internet of Things, enable companies to increase the performance of companies. This transformation driven by digital technologies is becoming crucial for companies. (Henriette et al., 2016)

2. Literature Review

Nowadays, the ICT the sector shows its important part to all European countries, not just because of its strategic role, its potential for employment growth in the sector itself, but also for the opportunities that the dynamic and energy ICT industry brings to business sectors, the public sector, and consumers.

Indeed, information and communication technologies are today generally considered to be essential components of economic and social development in the so-called "knowledge society" and attract the attention of governments, businesses, citizens, and civil society organizations. They represent multi-functional tools that provide great opportunities for information and communication and have applicability in the whole field of economic, social, political, and cultural life. Globalization and the dissemination of information have transformed our lives in different and profound ways.

The European Commission annually monitors the progress and level of development of digital competitiveness in individual member states using the Digital Economy and Society Index (DESI), which uses a combination of 44 indicators in five main dimensions of measurement: 1. Internet connectivity, 2. digital skills, services, 4. integration of digital technologies, and 5. digital public services. The index makes it possible to assess the overall level of digitization of society in each Member State. Furthermore, due to the division of the five dimensions into specific sub-dimensions and indicators, it identifies problematic areas to which the state should pay more attention. Finally, the index is used to compare the EU Member States.
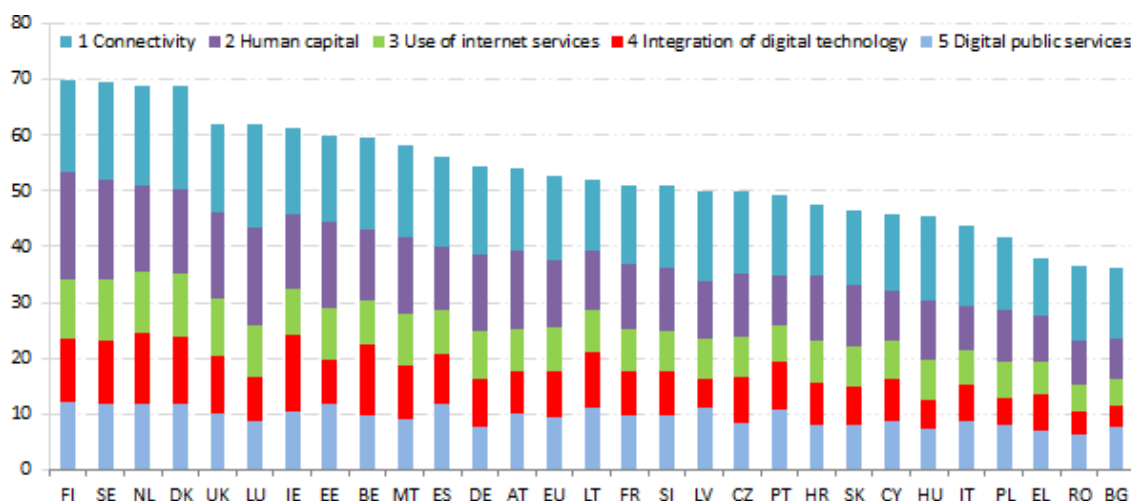
Figure 1: Digital Economy and Society Index (DESI) 2019
Source: European Commission

In this paper, we focused primarily on the V4 countries – i.e. Slovakia, the Czech Republic, Hungary, and Poland. Looking at the overall results of DESI, it is clear that the situation in our selected countries is comparable, with the Czech Republic ranking best in 18th place, followed by Slovakia in 21st place, Hungary in 23rd place and the last of our selected countries in Poland in 25th place. from 28 EU Member States.

Information and communication technologies include computers, telecommunications technologies (telephones, mobile phones, radio, radio and television broadcasting) as well as network technologies (mainly the Internet). These old and new forms of technology often converge in the forms of communication practiced in many communities. They are also tools that provide opportunities for access to information, communication, and self-expression. Internet searches, blogs, online multimedia resources, social media, as well as services such as e-government, e-health, e-banking, e-learning, e-commerce, electronic voting, all this create new challenges for communication, engagement, and social and economic behavior.

This rapid development of various digital technologies that can open new opportunities, new opportunities for communication, and new roles in society for women and girls. Technologies have the potential to be an effective tool for achieving equality between women and men. This sector offers highly qualified and well-paid jobs. If it is fully open to both halves of the population, it can help close the persistent gender pay gap. After all, in the Czech Republic the gender pay gap is almost 22 percent, which is the second-worst result in the European comparison.

ICT sector has created new opportunities for education and the labor market and presented new solutions for more flexible and diverse use of time and space at work. In many aspects, ICT work, in general, offers favorable working conditions, in terms of quality of work and timing that promote work-life balance. Compared to other occupations, several differences between men and women in terms of working arrangements in ICT jobs have narrowed. For example, compared to women in the health professions and other occupations, women in ICT jobs have a better physical and social environment and a better quality of working time. Atypical hours, such as working in the evening, at night and on weekends, are less common in ICT than in other jobs. Women and men in the field of ICT have more autonomy in deciding on working hours, and most of them feel that their working hours complement their family or social commitments. (EIGE, 2018)

Despite increasing participation, women are still under-represented in the labor market (on average, 62.3% of the OECD workforce averaged 62% in 2012). They also employ more than 50% of central government jobs, but only 29% of management positions. In addition, there is a significant reduction in the participation of women in the ICT sector in almost all Central European countries (up to 10 percentage points), but also in Austria, Denmark, France, the United Kingdom and Ireland (3 to 5 percentage points). The only European countries where the proportion of women in STEM has actually increased slightly are Estonia, Belgium, and Malta. More generally, however, women are under-represented in their STEM careers and this trend is spreading in many European countries. (OECD, 2014)

Today, the digital transformation provides new opportunities for women's empowerment in the economy and can contribute to greater equality between women and men. The Internet, digital platforms, and digital financial services offer "leap" opportunities for all and can help bridge the gap by enabling women to earn extra income, increase their employment opportunities and gain access to knowledge and general information. We must seize this opportunity to promote greater equality between women and men in the labor market, to promote economic growth, and to build a more inclusive digital world. (OECD, 2018)

The issue of digitization also concerns the reconciliation of work and family life. Digitization enabled by temporal and spatial flexibility of work is used mainly by women due to their increased need for malt in workplaces and family life. At the same time, however, the ideas of a capable and promising employee, who is a person with a high work commitment and a high degree of flexibility for the benefit of employers, do not change. Such a profile often corresponds to male employees. The digitization of the labor market can thus, as a result, contribute to the worse position of women in the labor market. (Úřad vlády ČR, 2018)

2.1. Women in ICT

Digital transformation offers a huge opportunity for the growth of economies and societies across countries around the world. However, the benefits of digital transformation are currently not evenly balanced between social groups and the sexes, and access, use, and ownership of digital tools are not gender neutral. The term "digital gender divide" is often used to refer to these types of gender differences in the resources and capabilities of accessing and effectively using ICT within and between countries, regions, sectors, and socio-economic groups (see UN Women, 2005).

Equality between women and men is not just a fundamental human right. It is also a cornerstone of a thriving modern economy that ensures sustainable and inclusive growth. Digital Transformation - offers new opportunities around the world and promises to increase productivity growth and improve the well-being of all citizens. However, in many developed economies, there is still a significant gender gap in the access, use, and ownership of digital technologies, which limits the equitable use of the benefits of digital transformation. Furthermore, transformation fundamentally changes the content and nature of jobs and the skills needed to perform them. This uncertainty about future employment will weigh on the potential impact of digitalization on the labor market for women: new and more flexible jobs can foster greater labor market participation and better jobs, but new challenges arise as automation and ICT spread across sectors and occupations and potentially disrupt existing labor policies and standards. New knowledge is needed to provide evidence that will enable governments to accurately diagnose problems and take steps to empower all individuals, but especially women, in our increasingly digital world. (OECD, 2018)

In the following picture we can see the percentage of women with ICT education in relation to the percentage of women working in the ICT sector. The red trend line shows a situation where the percentage of women employed in the ICT sector would be equal to the percentage of women with ICT education. In other words, countries,

where all women with an ICT education would work in the ICT sector, would be on the red line. If we focus on the V4 countries, we can see that in Slovakia, the Czech Republic, and Hungary, women with an ICT education mostly work outside the ICT sector (most notably in Slovakia). In contrast, in Poland, most women working in the ICT sector do not have an ICT education.
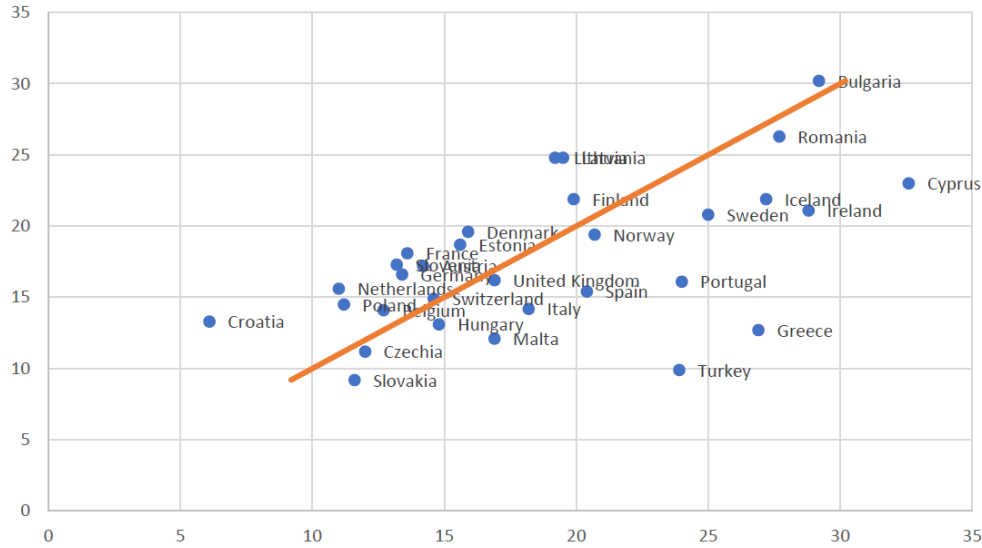
Figure 2: Women as percentage of all ICT specialists and as percentage of all employed in ICT sector
Source: Simonsen et al., 2019

If we focus on the number of women ICT specialists in the V4 countries we are monitoring, we can see the results as presented by Eurostat in the figure 2. When the lowest number of women in 2019 from the V4 states was 8.9% in Hungary and 14.8% the most in Poland. Unfortunately, even this number does not reach the EU average of 17.2%, let alone the values of the Nordic countries.

For comparison, we can also present the development of these parameters over time as shown in the following figure 3.
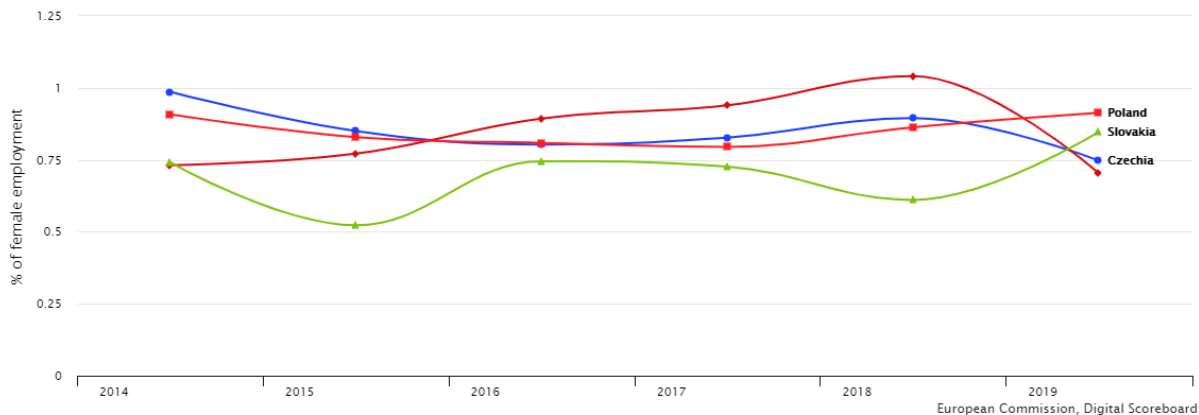
Figure 3: Female ICT specialists in V4 countries
Source: Eurostat

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2.2. Gender gap

The gender pay gap is a well-known phenomenon. Numerous studies and organizations have confirmed that women are paid less than men (UN Women, 2015). This is partly due to segregation and gender stereotypes; women are associated with traditionally "female" occupations and these are associated with worse working conditions and lower wages (Prokos et al., 2009; Stockdale et al., 2013). ICT and the digital industry are specific barriers for women. Technology-related jobs are traditionally filled by men.

This is an area where the most pronounced impact of stereotypes is evident, which represent barriers to women's access and create barriers to their development (Sharp et al., 2012; Hari, 2016). Women in these sectors are perceived primarily as women, not as ICT workers or engineers (Faulkner, 2009; Hatmaker, 2013); this affects the types of positions they hold and their promotion within organizations through horizontal and vertical professional segregation (Valenduc, 2011). As a result, they are more likely to receive lower salaries than men (Iglesias - Fernández et al., 2010; Belgorodskiy et al., 2012; Shen, 2016; European Commission, 2018a).

Various international organizations and the private sector are aware of the traditional over-representation of men in the ICT sector and have emphasized the desirability of attracting more women to the sector, as women have "untapped potential for the sector" (Valenduc, 2011). This perception has deepened as a result of the Fourth Industrial Revolution, the so-called Industry 4.0 phenomenon, which renewed interest in robotics, automation, and intelligence of products and systems (Schneider, 2018) and focused on the major role of ICT in the future, (International Labor Office, 2018). Indeed, recent technological developments have increased the pressure to address the low participation of women in ICT sectors and professions. In the European Union, in 2015, tertiary ICT graduates accounted for only 3.6 percent of all graduates, of which only 19 percent were women. This gap is reflected in the professional sphere: in 2015, only 16.1% of all ICT workers were women, which is less than 22.2% registered in 2005 (European Commission, 2018a). This gap is serious throughout the EU, but there are differences between countries (European Commission, 2018a) with different economic and social contexts.

As reported by Anker (1998), data suggest that the existence of segregation in the ICT sector, such as discriminatory social norms or indirect discrimination (eg work attributes, employment conditions), institutional or organizational factors (Belgorodskiy et al., 2012), and stereotypical barriers could lead to differences in working conditions in different countries. The study of different national and cultural contexts is therefore essential to address the gender imbalances that characterize ICT industries and professions (European Commission, 2018a).

However, the gender pay gap remains a major challenge and remains one of the highest in the EU. The gender pay gap is also reflected, for example, in differences in the average old-age pensions of women and men and in the persistently higher risk of poverty for older women. Despite some partial activities of the public administration aimed at promoting equal pay, the gender pay gap is declining only very slowly and by 2020 it will certainly not be possible to reach the goal set in the Government strategy (to reach the average gender pay gap in the EU, which is currently 16%). However, the gender pay gap remains a major challenge and remains one of the highest in the EU. The gender pay gap is also reflected, for example, in differences in the average old-age pensions of women and men and the persistently higher at-risk-of-poverty rate for older women. Despite some partial activities of the public administration aimed at promoting equal pay, the gender pay gap is declining only very slowly and by 2020 it will certainly not be possible to achieve the goal set in the Government strategy (to reach the average gender pay gap in the EU, which currently stands at 15.9%).(Úřad vlády ČR, 2018).

The Gender Equality Index, a tool for measuring progress on gender equality in the EU and developed by EIGE. It raises the profile of areas for improvement and ultimately supports policymakers in proposing more effective

gender equality measures. The EIGE Gender Equality Index shows that progress on gender equality is still evolving at a snail's pace, but we are moving in the right direction. While the score of the Gender Equality Index in the EU rose from 66.2 points (out of 100) in 2015 to 67.4 in 2017, the EU still has much room for improvement. Since 2005, the EU score has increased by only 5.4 points. Unfortunately, in our V4 countries, the situation is even worse when the lowest rating in this score is Hungary 51.9 points (out of 100 points), followed by Slovakia 54.1 points (out of 100 points), followed by Poland 55.2 points (out of 100 points) and the best of us The Czech Republic finished with 55.7 points (out of 100 points), which are, however, still significantly lower than the EU average. (EIGE, 2019)

4. Date, Methodology and Research Results

As part of our research, we focused primarily on answering the question: Is it possible to use selected factors to change the number of women working in the ICT sector? Based on a literature search, we then looked for factors that could affect how many women work in the ICT sector. This issue is important because we assume that the growth of this ratio can lead to positive results in the development of innovative companies. The key factors which are subsequently subjected to regression analysis, we consider both the factor that determines our level of development of the ICT sector in the national economy. Subsequently, we chose a factor that indicates the number of employed women who completed ICT Education. For equally important to also consider how high the average wage in the country or how big they are in the country gender differences. Research limitations can be registered with in the quality of the data used obtained from Eurostat and OECD databases. This part further examines the selected determinants, using the method of regression analysis of panel data for the period 2008-2018 on data for the Czech Republic, Slovakia, Hungary and Poland. The data source that we used for the analysis was obtained from Eurostat and OECD databases. The reason for limiting the time series is the lack of current data for the following years.

We focused our research on determining the influence of selected factors on the number of women who work in ICT. On average, approximately 15.8% of women in the V4 countries are employed in ICT. Across the EU, the figure is 17.2%. The World Bank formally defines the participation rate of women in the labor force as the share of women in the labor force, which is within the age group 15–64. As an explanatory variable for determining this effect on the number of women in ICT, we use as the first number of employed women who have studied ICT. Other explanatory variables are used selected relevant ICT indicators. These explanatory variables are the indicators Percentage share of the ICT sector in a country's GDP, the ratio of women employed in each country, the average annual wage in each country, and the Gender gap. All data used are drawn from the Eurostat and OECD databases. Summary statistics on the main variables (including mean, standard deviation, and minimum and maximum values) are given in Table 1.

The resulting variables, ICT development indicators, and control variables are marked as "Y", "T" and "X". As usual, b is a constant, and a and u are estimates, while the error term is shown as E: The country and time identifiers are "i" and "t". Use of panel data, where we use data for individual V4 countries and at the same time data from the time period 2009-2018:

$$y_{it} = \alpha_i + \beta_1 x_{it1} + \beta_2 x_{it2} + \beta_3 x_{it3} + \beta_4 x_{it4} + u_{it} \ .$$

where y: fe_ict (is a dependent variable) - the number of women working in ict
X1 ict_hdp - share of the ICT sector in the GDP of the given country
X2 ict_educated_e_female - number of employed women who graduated from ICT
X3 wage - the average annual wage in a given country
X4 gp - gender gap in the given country
u - is a random component

Table 1: Statistical description of the individual variables

Variable	Mean	Std. Dev	Min	Max
fe_itc	158,275	8,65	8.5	39
zam_fe	3029,25	2,380,101	1012,6	7199,1
gp	11.94286	3,779	3,773	16,4552
wage	23320,75	1,916,359	20150	29106
ict_ed-female	13,1525	14,315	1.1	48,2
ict_hdp	4,422275	0.960267	3.01	6.11

Source: the authors

The aim of the regression analysis using panel data is to determine the degree of influence of individual determinants on the number of women in ICT. Based on the results of previous research on this issue, we have established the following hypotheses:

- Reducing the gender gap leads to an increase in the number of women in the ICT sector. (The null hypothesis H0 = Gender Gap has no effect on increasing the number of women in the ICT sector.)
- Increasing the employment of women leads to an increase in the number of women in the ICT sector. (Zero hypothesis H0 = Higher number of working women does not affect the increase in the number of women in the ICT sector.)
- Increasing the average wage leads to an increase in the number of women in the ICT sector. (Null hypothesis H0 = Increasing the average wage does not affect the increase in the number of women in the ICT sector.)
- Increasing the number of women with ICT education will have an impact on increasing the number of women in the ICT sector. (Null hypothesis H0 = Increasing the number of women with ICT education does not affect the increase in the number of women in the ICT sector.)
- Increasing GDP in the ICT sector leads to an increase in the number of women in the ICT sector. (Null hypothesis H0 = Increasing GDP in the ICT sector does not affect the increase in the number of women in the ICT sector.)

Table2: Results of regression analysis of panel data

fe_itc	Coef.	Std. Err.	t-Statistic	P>|t|
zam_fe	0,0724273	0,005	14,25	0,000***
gp	3.840218	140,065	2,74	0,006**
wage	0,0048912	0,001832	2,67	0,008**
ict_ed-female	-2.827609	0,8333	-3,39	0,001***
ict_hdp	33.28199	6,125,953	5,43	0,000***

Source: the authors

We decided to use model with random effects, that came from the results of the Hausmann and Breuch-Pagan test. The robustness of the results was subsequently tested by several tests. A positive result was obtained in all tests.

$$y_{it} = -316,91 + 33.28x_{it1} - 2.82x_{it2} + 0.005x_{it3} + 3.84x_{it4} + u_{it} .$$

The results from the regression analysis of panel data are presented in Table 2. The analysis of panel data confirmed the significance of all investigated determinants (rejection of null hypotheses related to these determinants). The results of the regression analysis of the panel data lead to the rejection of all null hypotheses about any influence of determinants on the employment of women.

Reducing the gender gap leads to an increasing number of employed women in the ICT sector, which proved to be statistically significant at the 1% level of significance. In other words, the p-value is low enough to reject the null hypothesis. We can, therefore, say that the shrinking gender gap has an impact on increasing the number of women in the ICT sector. We can also reject the null hypothesis for women's employment, which has a positive impact on the number of women employed in the ICT sector. The increase in the average wage leads to an increase in the number of women in the ICT sector, which we have demonstrated at the 5% level of statistical significance. Increasing GDP in the ICT sector does not affect the increase in the number of women in the ICT sector as null hypothesis should be rejected as well as the hypothesis that the increasing the number of women with ICT education does not affect the increase in the number of women in the ICT sector. Increasing GDP in the ICT sector has affected the increase in the number of women in the ICT sector, it should be rejected the null hypothesis and the hypothesis that an increasing number of women to education, ICT has no impact on increasing the number of women in the ICT sector.

In other words, all our hypotheses have been confirmed and the results clearly show that the growth of GDP in the ICT sector has the greatest impact on an increasing number of employed women in the ICT sector. Appropriate also to consider finding that substantially negative value of women educated in ICT corresponds to our previous findings presented in the article, when only the Polish women working in ICT also worked in ICT and in other V4 countries we reviewed this trend was reversed. Of the other results, we also consider the fact that if the Gender gap decreases, the number of women employed in ICT will start to grow. This fact is also supported by data from the Eurostat database, which shows the fact that the gender pay gap is even greater in the ICT sector than in other businesses.

Conclusion

Gender equality in education and the labor market is a prerequisite for a sustainable society and more efficient economies. At a time of deep digitization and rapid growth of the ICT sector, the EU faces two main challenges: the lack of ICT professionals and the significant under-representation of women among them. The demand for ICT professionals is particularly high and there is a shortage of more than 500,000 ICT experts in the EU forecast by 2020. While women have on average a higher level of education in the EU than men, in the EU only a fraction of the potential of women is used in the STEM professions and especially in ICT (EIGE, 2017c). Of the 8 million ICT professionals, only 17% are women. From 2012 to 2016, there was a small improvement in women's participation in ICT jobs in the EU. EIGE estimates that attracting more women to STEM jobs would strengthen the labor-congested market (creation of up to 1.2 million new jobs by 2050), with a profit of around € 820 billion by 2050 (EIGE, 2017a). It would also strengthen the growth and competitiveness of European Union countries.

The unequal sharing of caring roles between women and men is another serious obstacle to work-life balance. Although gaps in the care of women in ICT are smaller than in other professions, inequalities persist. It is expressed in the different length and structure of working time between women and men in ICT jobs and in different ways to keep up with work pressure and responsibilities at home. On average, men specialize in ICT specialists longer than their colleagues. Although part-time work is relatively less common among ICT professionals, childcare, and other family or personal reasons are among the most common reasons why women work part-time in ICT. Longer working hours among men lead to lower acceptance of family responsibilities or, conversely, more active contribution of men to family and caring responsibilities is hampered by longer working

hours and greater commitment to working. In addition, more women than men in ICT jobs feel that their work prevents them from devoting time or most of their time to their families. It reflects gender stereotypes and expectations regarding parenting by different standards for good mothers and good fathers. (EIGE, 2018)

However, the current situation with Covid-19 has shown us new opportunities to work from home and there is a strong assumption that although the economy and related problems will certainly slow down now, it could also be reflected in the possibility of better employment for women by introducing more home. Our research has clearly demonstrated the importance of the individual factors we used in the research. If we want to increase the participation of women in the ICT sector, it is necessary to pay attention to each parameter separately.

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Ing. Hana KRCHOVÁ, Ph.D. is an Assistant Professor of the Department of Management and Marketing, Faculty of Economy and Business, Pan-European University, Bratislava, Slovak Republic. Her research interests are: Projects, Project Management, Innovation Management, and Strategic Management.
ORCID ID: orcid.org/0000-0003-3550-5300

Ing. Katarína Švejnová Höesová is an Assistant of the Department of Management, School of Economics and Management in Public Administration in Bratislava, Slovak Republic and is PhD candidate at University of Economics in Prague. Her research interests are: Pension systems, Gender Gap, Social Sesurity and Workforce productivity.
ORCID ID: orcid.org/0000-0001-5730-5364

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HOW TO EVALUATE THE DIGITAL ECONOMY SCALE AND POTENTIAL?[*]

Roman Chinoracky [1], Tatiana Corejova [2*]

[1,2] *University of Žilina, Faculty of Operation and Economics of Transport and Communications, Univerzitná 8215/1 010 26 Žilina, Slovakia*

E-mails: [1]roman.chinoracky@fpedas.uniza.sk ; [2]tatiana.corejova@fpedas.uniza.sk (Corresponding author)*

Abstract. Technological progress is synonymous with current and past changes. In the past these changes led to increased efficiency of production. Driving forces behind today's technological progress are digital technologies. Emergence of digital businesses significantly contributes to a new type of economy, which acquires the adjective digital. Building on the experience gained from the technological advances of past centuries, digital technologies, which make the digital economy by the mass use of them, are and will be an important factor influencing economic growth. Therefore, the aim of this article is to propose the measure of the scale and potential of digital economy. Measurements are realized in the form of composite indicator designed for the policymakers that deal with the creation of strategies for further growth and the direction of national economies. This composite indicator consists of individual indicators related to tree areas – economy, labour and skills, that can be used to determine the scale and the potential of the digital economy. The scale of the digital economy varies across the examined countries. An interesting finding is the fact that the scale of the digital economy is not conditioned by the geographical or economic scale of the state.

Keywords: Digital transformation; digital economy; composite indicators; scale of digital economy

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1. Introduction

Digital technologies are the driving force behind today's technological progress. Digital technology can be understood as all types of electronic devices and applications that use information in the form of numerical codes. Microprocessor-based devices that process and use digital information include personal computers, cell phones, and communications satellites. Digital applications such as the Internet, operating systems, and enterprise resource management information systems are dependent on such devices (Urbinati et al. 2020; Khin, Ho 2019).

The use of digital technologies leads to the digitization of processes (Brennen, Kreiss 2014). While digitization represents the conversion of multiple streams of information within a part of a certain process, by digitalisation we speak of the conversion of all streams of information within the whole process. Digitalisation, simply put, represents the introduction and use of a specific digital technology by companies, or the entire industry in a single project (Wachal 1971). The company can carry out a series of digitalisation projects: from the digitization and subsequent automation of production processes, the introduction of information systems for customer relationship management, transition from classic marketing tools to new digital marketing tools, changed use of data, including offering new digital services, to the retraining of employees using digital technologies (Corejova, Chinoracky, Valicova 2020; Genzorova, Corejova, Stalmasekova 2018; Corejova, Rovnanova, Genzorova 2016; Tengler, Kolarovzski, Kolarovzska 2017; Madlenak, Madlenakova 2015; Madlenak, Madlenakova 2017). Collectively, the series of digitalisation projects is referred to as digital transformation. Digital transformation is a strategic transformation that requires not only the implementation of digital technologies, but also cross-cutting organizational changes, a shift in corporate culture and business models (Strenitzerova 2016; Strenitzerova, Garbarova 2016). The digital part of this transformation involves the transition from existing systems, enterprise infrastructure and the business models to upgraded platforms and software, which is often delivered as a cloud-based service instead of traditional desktop applications. Changes in corporate culture involve the adoption of digital technologies by employees, which make their work more efficient and easier (Reis et al. 2018; Verhoef et al. 2019; Ebert, Duarte 2018; Williams, Schallmo 2018; Corejova, Rostasova 2015).

The digital transformation is not only changing the way businesses operate. Changes are present in a way the customers behave. Together, these two entities form the basis of the functioning of the economy. Emergence of new digital technologies and their integration into all spheres of society creates a new kind of paradigm of the economy. The new economy received new adjective "*digital*" (Zimmermann 2000; Akaev et al. 2018; Genzorova, Corejova, Stalmasekova 2018).

Digital technologies allow traditional industries to grow. In this context, digital transformation provided businesses with opportunity to expand, address additional demand and thus create an increased need for inputs, in particular capital and labour. (ITU 2017) The development and growth of companies leads to economic growth of entire industries, which can also lead to the growth of the entire state economies. Specific examples of impacts of digital technologies on the economic growth are in:
   – increase of productivity through the introduction of more efficient business processes supported by information and communication technologies and the optimization of supply chains. (Atkinson, Castro, Ezell 2009)
   – increase in corporate revenues from expanded market coverage. Digital technologies can attract labour to certain regions of countries as a result of information processing and the provision of services at a distance. The most affected services are in the areas of outsourcing and deployment of virtual customer care centres. (ITU 2017)
   – growth of some service sectors. For example, in software development and business processes outsourcing. (Crandall, Lehr, Litan 2007)

Assuming that the mass adoption of digital technologies (such as artificial intelligence, machine learning, robotics and blockchain etc.) will take place within ten or twenty years, it can be concluded that their economic impact will be significant. If operating costs are significantly reduced and thus the price of products is reduced, at least part of this reduction will be felt by consumers, who will benefit from the increased efficiencies caused by digital technologies. Digital technologies could reverse the offshoring trend of multinational companies and dramatically change global production chains (ITU 2017). The effects of digital transformation and the use of new technologies do not only affect economic growth. Changes of the nature of work in all sectors and professions are and will be present (IMF 2018, Schwab 2017).

Taking into account that digital technologies are driving the technological advances of today and they are behind the emergence of digital economy which can cause economic growth and change of labour market some questions are certain: What is the scope of digital economy and what are the options for measuring the digital economy?

2. Theoretical background

If we want to measure the outputs of the digital economy, it is necessary to examine which companies make up the digital economy, and therefore, fall under the theoretical framework of digital economy. This problem was addressed by Buhkt and Heeks, in their study "Defining, Conceptualising and Measuring the Digital Economy". The scale of the digital economy can be determined from its core representing the digital (ICT) sector to the digital economy from a narrower perspective and the digitized economy from a broader perspective (Bukht, Heeks 2017). The core of digital sector includes the production of information technology hardware, software production, the provision of information services, IT consulting services and the provision of ICT products (OECD 2002; Madudova, Corejova 2019).

The digital economy in the narrower perspective takes into account the overall range of applications of digital technologies. This includes the core of the digital economy, the provision of digital services and applications as well as digital platforms as a supporting tool of business processes. The way of providing some long-term services as a result of large-scale application of IT technologies into practice is changing. This means that new services are emerging. These services are provided due to the penetration of new technologies on the market. Therefore, a narrower definition of the digital economy encompasses a wide range of activities, taking into account the fact that not all digitized activities are part of the digital economy (Bukht, Heeks 2017).

From a broader perspective, the digital economy embraces also e-commerce and e-business, algorithmic economy, the use of digitally automated technologies in industry (industry 4.0) and agriculture (precision agriculture) (Bukht, Heeks 2017). Algorithmic economy is synonymous with algorithmic businesses. Algorithmic businesses deal with the industrial use of mathematical algorithms, which are applied in companies to acquire knowledge that can be used repeatedly and easily, for the purpose of improving and subsequent implementation of important business decisions (Meulen van der 2016). The term Industry 4.0 represents the integration of complex physical machines and devices with network sensors and software that is used to predict, control and plan not only better business but also social results (Germany Trade & Invest 2014). Businesses providing precision farming services, using digital technologies from GPS, sensors, robotics, autonomous vehicles, drones, automated hardware, telematics and software, enable farms and other agricultural companies to collect, process and analyse temporal, spatial and individual data. These data in combination with the information available to the farm or agricultural company supports its decisions to improve resource efficiency, productivity, quality, profitability and the sustainability of agricultural production (Schmaltz 2017).

The transition between the narrow and broader perspectives of digitalised economy is represented by gig and sharing economy platforms. The economic activity of companies providing gig platforms and the shared economy platforms is realized exclusively through digital technologies by connecting users using these platforms through

the Internet. Conversely, the exchange of certain goods or services between end-users of a given platform takes place outside the digital environment. That's why, gig and the sharing economy are indirectly part of not only the broader scope of digital economy but also the narrower scope of digital economy (Hamari, Sjöklint, Ukkonen 2016; Mukhopadhyay, Mukhopadhyay 2020; Stalmasekova, Genzorova, Corejova 2017).

If we can say what forms the framework of the digital economy, it is appropriate to look at the possibilities of measuring the digital economy. The performance of economic entities is quantified by specific indicators (Kovanicova 2005). A number of studies have been devoted to the question of which indicators should be measured in the digital economy. A comprehensive framework following these studies was published by the G20 in 2018 in its "Toolkit for measuring the Digital Economy" study, which was followed up and supplemented by new findings of the OECD in 2020 in the study "A roadmap toward a common framework for measuring the digital economy". The demand for new data, new indicators and tools to measure the digital economy is acute due to the growing role that digital technologies play in the economies of the world and the rapid pace of development that characterizes these technologies. OECD, in the study "A roadmap toward a common framework for measuring the digital economy", and the G20, in the study "Toolkit for measuring the Digital Economy", did not develop new indicators to measure the performance of economic entities belonging under the framework of digital economy. Existing indicators and methodological procedures were selected for the measurements of digital economy in an effort to compile basic, standardized and comparable indicators of the digital economy (G20 2018, OECD 2020). These individual indicators are thematically grouped into three areas, which are:
- the skills needed for individuals involved in the production of goods and services;
- jobs, in the sense of a workforce that is one of the factors of production influencing the output of companies in the digital economy;
- growth generated in some way by the activities of businesses in the digital economy.

Even if there are groupings of individual indicators with which it is possible to measure the digital economy, it is appropriate to add that individual indicators alone cannot specifically measure the digital economy. The application of digital technologies to business practice, from the digitization of information flows, digitalisation of business processes to the digital transformation of entire companies is a multidimensional phenomenon, which is commonly quantified with the help of composite indicators. There are more than 20 composite indicators that, from a certain point of view, deal with various measuring of the digital economy. These composite indicators mainly focus on areas such as electronic services of the state (or so called e-Government), digital skills in society, telecommunications infrastructure, use of digital technologies and digital innovations in society (Konovova 2015, Moroz 2017).

If the focus of these composite indicators is oriented in this way, a question arises. Is it possible to create a new way of measuring the digital economy? The answer to this question may be the use of already mentioned composite indicators, because the digital transformation is a multidimensional phenomenon that cannot be explicitly measured by individual indicators. However, if composite indicators for measuring the digital economy already exist, what new approaches need to be applied? The answer is in the dimensions defined by the study "A common framework for measuring the digital economy".

3. Research objective and methodology

If the study "A common framework for measuring the digital economy" defines the three dimensions of measuring the digital economy, it is possible to create a new approach to measuring the digital economy. If we also know the theoretical framework of the digital economy and specific indicators that can be used to quantify digital economy, it is possible to measure the scale of digital economy. Therefore, research results presented in this article combine the theoretical framework, OECD's findings on individual indicators and dimensions suitable

for measuring the digital economy and the findings that the digital economy, as a multidimensional phenomenon, is examined in the form of composite indicators. If the composite indicators of measuring the digital economy focus on specific areas of electronic services of the state, digital skills in society, telecommunications infrastructure, use of digital technologies and digital innovations in society, then it possible to propose and create composite indicator which will be based on the individual indicators proposed for measuring the digital economy by the OECD which will expressed on one hand digital skills and on the other hand will complement existing composite indicators by expressing what the analysed indicators do not examine – growth and jobs. So it is possible to say that the dimensional orientation of the proposed composite indicator defined in this way represents a new form of measuring the digital economy.

The proposed composite indicator will measure the scale of the digital economy and the potential that can arise from changes of the measured values over time. Name of the composite indicator is *Digital economy scale index*. Digital economy scale index is composed out of individual indicators which are derived from already mentioned OECD's study "A framework for measuring the digital economy". Set of individual indicators was modified for the needs of created composite indicator. Same applies for the names of the areas (or dimensions) of individual indicators. Methodologically, the composite indicator was constructed according to the methodological and user guide "Handbook on Constructing Composite Indicators" from OECD (OECD, 2008). To make the measurements comprehensive in terms of available data Digital economy scale index was quantified for 19 OECD members' countries within the time frame of eleven years (2008-2018).

3.1 Structure of the proposed composite indicators

Digital economy scale index measures to which extent the values of individual indicators contribute to the total values of these indicators at the state level. The individual indicators that make up the Digital economy scale index express the economic side of the performance of companies that fall under the theoretical framework of digital economy and the investment of all companies in digital technologies, including their import and export. If the Digital economy scale index is set to measure the digital economy from broadest possible way, the companies that were examined fall under the ICT sectors' detailed definition and high digital intensive industries. Both groups are named according to the classification of companies that OCED uses in its own OECD STAN database (ISIC rev.4).

The economic area is included in the Digital economy scale index. It is its dimension, and is named as *economy*. Indicator of investment in digital technologies represents capital, as a production factor or input into the production of goods and services, which is necessary for a company to make a profit. Achieving the required profit is conditioned by the growth of business performance. If the performance of companies grows, so does the performance of the state's economy.

The performance of an economy depends on labour, which is related to an individual's effort to bring a good or service to the market (Hanink 2017). An important characteristic of work is its quality, which means knowledge, education, qualification of work and its productivity. The rapidly changing structure of the economy, triggered by digital technologies, places increased demands on the quality of work and its ability to adapt to these changes. Therefore, the quality of work is an essential part of the digital economy (Lisý 2005). Respecting the basic features of quality of work, *labour* is another dimension, which is included in the Digital economy scale index. Dimension *labour,* in the form of other individual indicators, quantifies employment and labour productivity in ICT and high digital intensive industries, the number of specific jobs affected by digital technologies and the demand for these jobs (that is being created by companies).

The performance of a certain work and its quality is influenced not only by the knowledge and competencies, but also by the skills that the workforce has or should have at its disposal. The digital transformation creates a demand for knowledge and skills in two lines. The first line concerns the production of products such as software, websites, e-commerce and e-business systems, cloud technologies and big-data analytics. The production of these products requires a comprehensive knowledge of ICT, which is specific and related to the programming, application development and management of telecommunications and computer networks. The second line points out that workers in a wide range of occupations need to acquire general ICT skills in order to be able to use these technologies in their daily work. Taking into account both lines of demand for specific and general knowledge and skills, this demand should be met by supply created by a highly skilled workforce. Graduates who will be employed as scientists, engineers and ICT professionals will form and also form the core of the demand for a highly qualified workforce. These graduates will be primarily university graduates who have studied the fields of natural sciences, mathematics and statistics, information and communication technologies and technology, production and construction, where there is a presumption that these fields of study with their curriculum are capable of preparing these graduates for specific jobs as scientists, engineers and ICT professionals (OECD 2020). Therefore, individual indicators relating to graduates of a given fields of study, which are included in the Digital economy scale index, are categorized under another dimension, which is called the *skills*.

As in the case of individual indicators for the dimension of *economy*, indicators of dimensions' *work* and *skills* express the extent to which the values of individual indicators contribute to their overall values at the state level. By determining the share of the values of individual indicators in the total values of indicators at the state level, it will be possible to compare countries with each other, regardless of their geographical, population and economic scale.

By knowing the development of the values of Digital economy scale index, it is also possible to assess the potential over time. Development of values of the index points out to the long-term potential of the digital economy to be a significant part of national economy. Whether this potential is declining or increasing, it is possible to examine if digital economy will be an important part of the overall economy of the state or not.

The choice of individual indicators for Digital economy scale index was influenced by the fact that not all indicators can be quantified for all 19 countries for a period of eleven years. It should be emphasized that there are a number of individual indicators that could complement Digital economy scale index. Therefore, proposed set of individual indicators is a set of selected individual indicators. Individual indicators include in the Digital economy scale index are listed in Table 1.

Individual indicators were derived from databases OECD STAN, OECD National Accounts, OECD Information and Communication Technology, OECD Education and Training, UNCTAD Information Economy, Eurostat Digital Economy and Society, Eurostat Education and Training. On many occasions the data for particular year or country were missing. These data were refiled using the linear regression method with which the values of individual indicators were predicted. If it was possible, some missing data were replaced. For example, data in some countries were missing for ICT investments, but data for investments in machinery (which ICT investments is a part of) were available. Therefore, ICT investments were, for some countries, substituted by investments in machinery. Another instances of missing data occurred due to the changes in methodology of measurements. This was the case of individual indicators of dimension *skills* where two different classifications of education had to be used (ISCED 1997 and ISCED 2011).

Table 1. Individual indicators of index of the scale of the digital economy.

	Dimension	Individual indicator
Index of the digital economy scale	Economy	Share of value added of the ICT sector and high digital intensity industries on GDP (%)
		Share of ICT investment on GDP (%)
		Share of imports of ICT products on total imports (%)
		Share of exports of ICT products on total exports (%)
	Labour	Share of employment in ICT sectors and high digital intensity industries in total employment (%)
		Labour productivity in the ICT sector and the high digital intensity industries (millions of €)
		Share of employees performing ICT specialist work in total employment (%)
		Share of companies looking for ICT specialists on the total number of companies (%)
	Skills	Share of graduates with bachelor's degree of natural sciences, mathematics and statistics to the total number graduates with bachelor's degree of all university study programs (%)
		Share of graduates with master's degree of natural sciences, mathematics and statistics to the total number of graduates with master's degree of all university study programs (%)
		Share of graduates with doctoral degree of natural sciences, mathematics and statistics to the total number of graduates with doctoral degree of all university study programs (%)
		Share of graduates with bachelor's degree of information and communication technologies to the total number of graduates with bachelor's degree of all university study programs (%)
		Share of graduates with master's degree of information and communication technologies to the total number of graduates with master's degree of all university study programs (%)
		Share of graduates with doctoral degree of information and communication technologies to the total number of graduates with doctoral degree of all university study programs (%)
		Share of graduates with bachelor's degree of engineering, manufacturing and construction to the total number of graduates with bachelor's degree of all university study programs (%)
		Share of graduates with master's degree of engineering, manufacturing and construction to the total number of graduates with master's degree of all university study programs (%)
		Share of graduates with doctoral degree of engineering, manufacturing and construction to the total number of graduates with doctoral degree of all university study programs (%)

Source: Authors.

3.2 Normalization

As we can see in table 1, Digital economy scale index is compiled out of 17 indicators. Almost all of them are expressed in the same unit of measure except for the individual indicator of labour productivity in the ICT sector and high digital intensity industries. This means that values of individual indicators had to be normalized. For the needs of normalization, the Min-Max method was used. Min-Max method normalizes all individual indicators so that their values range from 0 to 1.

Each individual indicator $x_{q,c}{}^t$ for the country c at time t was transformed to $I_{q,c}{}^t$ – the normalized value of the individual indicator q for country c at time t where $q = 1, ... ,Q$ and $c = 1, ... ,M$.

Formula which we used for calculation of normalized value is:

$$I_{q,c}^t = \frac{x_{q,c}^t - min_c(x_q^t)}{max_c(x_q^t) - min_c(x_q^t)} * 100$$

In this formula $min_c(x_q{}^t)$ and $max_c(x_q{}^t)$ are the minimum and maximum values of individual indicators $x_{q,c}{}^t$ across all countries c at time t. Values of $I_{q,c}{}^t$ are in percentages. For all individual indicators $I_{q,c}{}^t$, the higher their measured value, the more favourable their measured result. Therefore, values converging to 0 are expressed by minimum $min_c(x_q{}^t)$ and values converging to a value of 1 by maximum $max_c(x_q{}^t)$.

3.3 Weighing and aggregation

After normalization of the values of individual indicators of the Digital economy scale index, it was necessary to recalculate these values with the assigned weight. Why we used weight in our calculations? The real values of some indicators may be greater than the values of other indicators. We perceive all individual indicators equally. That's why normalized values of individual indicators were multiplied by the weight v which was calculated as a percentage of each individual indicator on the total number of 17 individual indicators:

$$v = \frac{1}{\sum_{i=1}^{n} x_i} * 100 = \frac{1}{\sum_{i=1}^{17} x_i} * 100 = \frac{1}{17} * 100 = 5,882$$

It should be added that, recognizing the limits of the equal weights of each individual indicator, not all dimensions have the same share in the total value of the composite indicator. The recalculation of the weights by determining the same proportions for each dimension represents an option for modifying the Digital economy scale index.

Values expressed by multiplication of the normalized value of an individual indicator $I_{q,c}{}^t$ with weight v were aggregated into the final value of the Digital economy scale index for country c at time t:

$$I_{SDE_c}{}^t = \sum_{i=1}^{n} I_{q,c_i}^t * v = \sum_{i=1}^{17} I_{q,c_i}^t * 5,882$$

4. Results

The values of the Digital economy scale index in percentages are presented in Table 2. Heat map used in this table graphically differentiates values from each other to distinguish those countries in which the scale of the digital economy is larger or smaller. Used heat map is based on a four-point scale in which the measured percentages are divided into four groups. The four-level scale groups were set up according to the scale of the digital economy. This scale is at low, medium low, medium high or high level. Countries are not naturally at the stage of complete or rather 100 % digital transformation. Respecting this fact, the values of the specified intervals, divided on a scale into four groups, are based on the measured values of the Digital economy scale index for each country and each year. The first group should consist of values, highlighted in white, from the range from 0 to 15%. No values for this interval were measured and therefore there are no such highlighted values in the table. The second group, highlighted in light grey, consists of values ranging from 15% to 30%. The third group, highlighted in light blue, consists of values from 30% to 45%. The fourth group, highlighted in dark blue, includes values from the range of 45% to 60%.

According to the measured values of the Digital economy scale index there are five countries – Czech Republic, Estonia, Finland, Luxembourg and Germany – where a high level of the digital economy was measured in year 2018. In countries such as Luxembourg and Germany, the scale of the digital economy has been high for a long time. In Finland, between 2011 and 2015, there was some decline in the scale of the digital economy, but ultimately its scale is high. Estonia has seen continuous growth of its the digital economy. While in 2008 it was at the level of 38.77% and its scale was medium high, in 2018 it already has a value of 47.56% and its scale is at a high level. In the Czech Republic, a gradual growth of the digital economy was recorded, and while in the years 2008 to 2017 its level was moderately high, in 2018 its level is already high. For the measured lower values, the medium scale of digital economy for year 2018 was in countries such as Latvia, Lithuania, Portugal and Spain. In Latvia, Lithuania and Portugal the scale of the digital economy has long been medium low. Portugal is the opposite of Estonia. In 2008, the scale of its digital economy was at a medium high level, reaching 39.07%. In ten years, the scale of Portugal's digital economy has steadily decreased by 11.29% to 27.78%. Significant decline for

Portugal was recorded between years 2011 and 2012. The same is true for Spain, where between 2011 and 2012 there was a significant decline in the scale of its digital economy. In other countries, such as Belgium, Denmark, France, Netherlands, Hungary, Poland, Austria, Slovakia, Slovenia and Italy, the scale of the digital economy was recorded at a medium high level.

Table 2. The heat map of the digital economy scale index

State	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	34.13	34.06	33.82	34.99	33.47	31.76	32.31	31.25	30.36	30.00	33.93
Czech Republic	43.98	44.19	42.95	41.48	41.99	42.67	44.15	41.70	42.21	43.49	47.33
Denmark	36.63	37.54	36.53	38.23	38.52	38.64	37.97	38.52	40.04	39.43	41.41
Estonia	38.77	34.30	40.49	40.80	43.64	46.43	45.42	43.74	49.95	49.60	47.56
Finland	50.00	46.47	46.27	43.63	42.39	43.87	44.60	44.49	45.56	42.91	46.60
France	44.06	43.79	43.90	41.30	38.66	40.43	40.20	41.05	40.50	40.55	42.21
Netherlands	33.50	33.37	29.30	37.19	38.62	36.04	37.38	36.96	39.56	38.93	42.00
Latvia	21.24	20.84	27.81	26.81	29.51	26.73	31.16	30.60	29.23	26.11	27.52
Lithuania	26.18	24.71	22.99	23.95	24.01	22.61	23.67	20.83	20.42	27.35	25.95
Luxembourg	53.62	55.34	53.38	52.87	54.12	44.67	42.55	42.30	48.85	43.68	52.56
Hungary	33.13	33.86	39.24	37.32	33.21	35.91	36.21	34.40	36.16	35.32	37.78
Germany	46.40	44.27	46.91	47.83	53.44	50.64	51.55	50.41	49.35	48.24	50.28
Poland	32.00	31.24	31.20	30.54	30.63	28.50	29.85	30.64	31.00	30.60	30.31
Portugal	39.07	35.41	31.20	32.11	26.93	28.13	29.05	26.66	29.44	27.67	27.78
Austria	43.53	43.93	42.70	43.57	39.33	40.37	43.91	40.40	41.97	38.78	39.85
Slovakia	36.63	36.83	35.69	35.28	34.83	35.45	34.70	35.23	36.34	34.38	34.76
Slovenia	24.38	23.16	25.12	23.36	26.99	29.94	31.43	27.97	23.60	29.77	31.70
Spain	34.20	33.56	37.90	33.42	27.24	32.99	31.32	32.71	29.26	25.35	27.22
Italy	27.23	28.72	28.76	29.35	26.20	30.63	29.46	33.63	31.99	30.09	31.90

Source: Authors.

Taking into account the fact that not all countries are equal in terms of its wealth, the assumption arises that the scale of the digital economy should be higher in those countries that are more economically developed and have a higher GDP per capita. The opposite is true, countries across Europe are differently grouped according to the size of the digital economy.

Among the countries, Luxembourg, Germany, Czech Republic and Finland are the leaders in terms of scale of their digital economy, placing themselves at the top almost every year. Estonia is also a leader, where the scale of its digital economy had grown to such an extent that since 2012 it has been one of the countries for which the highest values of Digital economy scale index were measured. There was also a significant shift in Netherlands, where continuous growth has also been recorded. On the contrary, the countries with the smallest scale of the digital economy have long been Lithuania, Latvia, Portugal and Spain. In other countries, there were no significant shifts in their position.

We may ask ourselves: Was there no fundamental shift due to the fact that the scale of the digital economy in all countries had grown or fell? The evolution of the measured values of the Digital economy scale index, presented in Table 3, show us how the values of the Digital economy scale index had changed over the examined time period. The largest progress was recorded in Estonia. In Estonia, as it was mentioned, the scale of the digital economy grew to such an extent over the time (+ 8.79%) that it is one of the leaders in terms of the scale of Digital economy. The same applies for the Netherlands, which digitally grew from 2008 to 2018 by 8.51 % into a

country where relatively large value of the Digital economy scale index was measured. High growth also occurred in Slovenia and Latvia, where the scale of the digital economy grew by 7.32% in Slovenia and by 6.28% in Latvia. Growth was also measured in Italy, Hungary and Denmark, with each of these countries growing by more than 4.5% in the scale of their digital economies. In the Czech Republic and Germany, digital economy risen by more than 3% in its scale.

Table 3. Changes in the values of the digital economy scale index for a selected period of time

State	2008	2018	2018 – 2008
Belgium	34.13 %	33.93 %	-0.20 %
Czech Republic	43.98 %	47.33 %	3.35 %
Denmark	36.63 %	41.41 %	4.77 %
Estonia	38.77 %	47.56 %	8.79 %
Finland	50.00 %	46.60 %	-3.4 %
France	44.06 %	42.21 %	-1.85 %
Netherlands	33.50 %	42.00 %	8.51 %
Latvia	21.24 %	27.52 %	6.28 %
Lithuania	26.18 %	25.95 %	-0.23 %
Luxembourg	53.62 %	52.56 %	-1.06 %
Hungary	33.13 %	37.78 %	4.65 %
Germany	46.40 %	50.28 %	3.88 %
Poland	32.00 %	30.31 %	-1.69 %
Portugal	39.07 %	27.78 %	-11.29 %
Austria	43.53 %	39.85 %	-3.67 %
Slovakia	36.63 %	34.76 %	-1.88 %
Slovenia	24.38 %	31.70 %	7.32 %
Spain	34.20 %	27.22 %	-6.98 %
Italy	27.23 %	31.90 %	4.67 %

Source: Authors.

The scale of the digital economy decreased most markedly in Portugal (-11.29%) and Spain (-6.98%). More than 3% declines were recorded in Finland and Austria. In Slovakia and France, the decline was at -1.85% in Slovakia, respectively -1.88% in France. The decline was also recorded in Poland and the digital economy of Poland fell by -1.69%. There was a relatively small decline in countries such as Belgium, Lithuania and Luxembourg. In Belgium it was a decrease by -0.20%, in Lithuania by -0.23% and in Luxembourg by -1.06%.

In Estonia and the Netherlands, it can be assumed that the potential of digital technologies had been exploited to such an extent that the digital economy had grown significantly over the years. Conversely, in Portugal and Spain, the potential of digital technologies has been exhausted at some point. The scale of the digital economy declined along with the decline of potential of digital technologies.

From the point of view of the dimensions forming the Digital economy scale index, it is possible to see in which specific areas the biggest changes took place (Table 4). In the case of Belgium and Lithuania, there was a small decline in the overall scale of the digital economy (up to -0.3%). Belgium's digital economy shrunk due to a decline in the share of the skills dimension. In the case of Lithuania, the impact of the labour dimension on the overall scale of the digital economy declined.

In countries where the scale of the digital economy decreased to -2%, the share of the labour dimension decreased in Poland and Slovakia. In France and Luxembourg, there was a decline in the proportions of dimensions of labour and skills. In Finland and Austria, where the scale of the digital economy fallen up to -4%, the share of the impact of the labour dimension decreased. In addition to the labour dimension, the impact of the economic dimension declined in Finland and the impact of the skills dimension declined in Austria. Decreases in the range of -4% to -12% occurred in Spain and Portugal. In these countries, in particular, the skills dimension declined. It was followed by the economic dimension, and Portugal also saw a decline in the labour dimension.

Table 4. Shares of dimensions in the total value of the digital economy scale index

State	2008			2018			Differences		
	Economy	Labour	Skills	Economy	Labour	Skills	Economy	Labour	Skills
Belgium	2.94%	13.20%	17.99%	3.21%	15.97%	14.75%	0.28%	2.77%	-3.24%
Czech Republic	10.38%	7.13%	26.47%	14.22%	6.47%	26.64%	3.85%	-0.66%	0.17%
Denmark	3.60%	14.54%	18.49%	4.49%	13.48%	23.44%	0.90%	-1.07%	4.94%
Estonia	4.20%	6.63%	27.94%	7.34%	7.19%	33.04%	3.14%	0.56%	5.10%
Finland	8.62%	15.77%	25.61%	3.71%	14.78%	28.12%	-4.91%	-0.99%	2.51%
France	4.06%	10.72%	29.27%	4.56%	9.86%	27.78%	0.50%	-0.86%	-1.49%
Netherlands	9.69%	10.72%	13.09%	11.15%	16.42%	14.43%	1.46%	5.71%	1.34%
Latvia	2.82%	5.90%	12.53%	6.78%	1.11%	19.64%	3.96%	-4.79%	7.11%
Lithuania	1.29%	5.16%	19.73%	2.45%	2.82%	20.68%	1.17%	-2.35%	0.95%
Luxembourg	6.75%	22.39%	24.49%	7.26%	21.63%	23.67%	0.51%	-0.76%	-0.81%
Hungary	14.00%	11.45%	7.68%	10.74%	8.21%	18.83%	-3.26%	-3.25%	11.16%
Germany	6.40%	12.27%	27.73%	7.19%	9.88%	33.21%	0.79%	-2.39%	5.48%
Poland	9.99%	5.77%	16.24%	11.73%	1.93%	16.64%	1.74%	-3.83%	0.40%
Portugal	5.13%	5.29%	28.65%	2.90%	3.98%	20.90%	-2.23%	-1.31%	-7.76%
Austria	3.52%	11.44%	28.56%	3.65%	9.02%	27.19%	0.13%	-2.43%	-1.38%
Slovakia	10.26%	7.82%	18.56%	12.05%	3.28%	19.43%	1.79%	-4.54%	0.87%
Slovenia	2.30%	7.52%	14.56%	1.97%	6.83%	22.90%	-0.34%	-0.69%	8.34%
Spain	3.23%	9.20%	21.77%	2.18%	8.84%	16.20%	-1.05%	-0.36%	-5.57%
Italy	3.31%	7.44%	16.48%	3.60%	6.45%	21.86%	0.29%	-1.00%	5.38%

Source: Authors.

The increase in the scale of the digital economy at the level of up to 4% was in the Czech Republic and Germany. In the Czech Republic, the dimension of economy was the main contributor to growth. In Germany, it was a skill dimension. Growth in the scale of the digital economy in the range of 4% to 7% was recorded in Hungary, Denmark, Latvia and Italy, where the skills dimension in particular contributed to this growth. In the case of the Netherlands, Estonia and Slovenia, growth in the scale of the digital economy was above 7%. The skills dimension in Estonia and Slovenia in particular contributed to this growth. In Estonia, the scale of the economy dimension also played a relatively high role in the scale of its digital economy. The scale of the Dutch digital economy was influenced by all three dimensions, and the labour dimension contributed most to this growth.

According to the measurements the dimensions and the scale of digital economy changed across all countries. But what is the prospect for the future? The answer is to examine the development of year-on-year differences in the measured values of the Digital economy scale index (Table 5). The development of values is expressed by the regression coefficient *a*. Regression coefficient determines the slope of the regression line and shows the trend.

The growth of the scale of the digital economy over time, expressed by a positive non-zero value of the regression coefficient *a*, represents the potential for increasing the scale of the digital economy and thus its impact on the economy of a certain state. On the contrary, its decline, expressed by the negative value of the regression coefficient *a*, indicates the potential for reducing the impact of the digital economy on the state economy. If the value of the regression coefficient converges to zero, it is possible to speak of a very low or almost zero potential for changing the impact of the digital economy on the state economy.

It should be noted that column names in Table 5, expressed as the two digits of the years surveyed, represent the annual periods that were the subject of the survey. The values given in Table 5, except for the column with the values of the regression coefficient *a*, are expressed as a percentage.

Table 5. Prediction of the growth of the scale of the digital economy

State	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	*a*
Belgium	-0.20	-0.72	3.46	-4.34	-5.12	1.73	-3.29	-2.85	-1.17	13.11	0.0058
Czech Republic	0.48	-2.81	-3.43	1.24	1.61	3.47	-5.55	1.22	3.03	8.84	0.0073
Denmark	2.47	-2.69	4.66	0.75	0.31	-1.74	1.45	3.96	-1.53	5.01	0.0022
Estonia	-11.5	18.04	0.76	6.96	6.39	-2.16	-3.71	14.21	-0.70	-4.10	-0.002
Finland	-7.05	-0.44	-5.70	-2.83	3.47	1.67	-0.25	2.41	-5.82	8.60	0.0091
France	-0.62	0.26	-5.91	-6.40	4.58	-0.57	2.13	-1.36	0.14	4.08	0.0051
Netherlands	-0.38	-12.2	26.95	3.84	-6.69	3.72	-1.12	7.04	-1.59	7.88	0.0027
Latvia	-1.88	33.44	-3.60	10.09	-9.44	16.57	-1.81	-4.45	-10.7	5.41	-0.016
Lithuania	-5.62	-6.98	4.20	0.26	-5.82	4.66	-12	-1.99	33.91	-5.09	0.0142
Luxembourg	3.20	-3.53	-0.96	2.36	-17.5	-4.75	-0.60	15.49	-10.6	20.35	0.0116
Hungary	2.19	15.90	-4.91	-11	8.11	0.85	-4.99	5.11	-2.31	6.95	-0.001
Germany	-4.60	5.96	1.97	11.73	-5.23	1.80	-2.22	-2.10	-2.24	4.23	-0.002
Poland	-2.36	-0.14	-2.10	0.27	-6.94	4.73	2.64	1.19	-1.30	-0.93	0.0024
Portugal	-9.38	-11.9	2.89	-16.1	4.46	3.27	-8.24	10.43	-5.99	0.38	0.0115
Austria	0.93	-2.80	2.03	-9.73	2.64	8.77	-7.97	3.89	-7.62	2.78	0.0002
Slovakia	0.55	-3.11	-1.13	-1.28	1.76	-2.10	1.51	3.15	-5.38	1.09	0.0009
Slovenia	-5.00	8.47	-7.00	15.52	10.92	5.00	-11	-15.6	26.16	6.48	0.006
Spain	-1.87	12.92	-11.8	-18.5	21.12	-5.07	4.45	-10.5	-13.4	7.36	-0.003
Italy	5.49	0.13	2.03	-10.7	16.93	-3.83	14.14	-4.86	-5.96	6.05	-0.001

Source: Authors.

According to the values in Table 5, the scale of the digital economy could potentially grow in countries such as Lithuania and Portugal. Both countries show greatest potential for further growth. Relatively high potential for growth in the scale of the digital economy was also recorded in Luxembourg. If we look back, for these three countries, the scale of the digital economy has declined over time (Table 4). But the outlook is positive, which may indicate that some impulses might have been created to increase the potential of digital technologies.

In the case of Luxembourg, the measured positive potential might mean an increase in the scale of the digital economy. This also may lead to the rise of digital economy's impact being further strengthened. Luxembourg's digital economy may be gradually forming an integral part of the Luxembourg overall economy. In the case of Lithuania and Portugal the measured potential may not only lead to growth of the impact of the digital economy on their national economies but might even potentially change from medium to medium high.

The same situation as in Lithuania, Portugal and Luxembourg occurred in Belgium, Finland, France, Poland, Austria, Slovakia and Italy. Scale of digital economies of these countries declined over time, but the outlook is positive and potential for the growth of the digital economy emerges. Digital economy of these countries may

grow its influence on the national economies. The potential of digital technologies, which was exhausted over the years, received further impulses, which may lead to the gradual growth of the scale and level of the digital economy of these countries.

In the case of the Czech Republic, Denmark and Slovenia, the digital economy grew. At the same time, a positive value of the regression coefficient *a* was recorded for all three countries, which suggests that there is potential for the scale of the digital economy of these countries to continue to grow.

The highest value for the potential decline in the scale of the digital economy was recorded in Latvia, a country where the scale of the digital economy is at a medium low level. While the scale of the digital economy had grown over the years in this country, the scale of the digital economy can be expected to decline in the future. The measured decline may indicate that the potential of digital technologies was fulfilled and has not received further impulses, so in the future it is possible to expect a decline in the scale of the digital economy and its impact on Latvia's national economy.

In the case of Estonia and Germany, it can be stated that both countries are leading countries with a high level of digital economy. In examined time period, their digital economy grew. The potential of digital technologies had been fulfilled and had not received any new impulses. Therefore, a slight decline in the scale and impact of the digital economy in the national economies of Estonia and Germany can be expected in the future. The same situation as in the case of Estonia and Germany occurred in Netherlands, Hungary and Italy, where the potential of digital technologies did not receive a new impulses and it is possible to expect a decline in the scale and impact of the digital economy on their national economies.

Conclusions

The digital economy, which is the product of application of digital technologies and subsequent digital transformation of business, is becoming one of the bearers of economic growth. That's why the measurements of digital economy are needed more than ever before.

There are several approaches to measure digital economy. One option is in the use of specific individual indicators. However, the digital transformation is not a one-dimensional phenomenon. Therefore, another possibility to measure digital economy is in the composite indicators, which are directly used for the needs of studying multidimensional phenomena. Currently, there are a number of individual indicators and composite indicators that can measure the digital economy. Therefore, the question was formulated in this article: Are there other ways to measure the digital economy?

Taking into account the theoretical basis and analysis of the possibilities of measuring the digital economy, the Digital economy scale index was proposed, created and measured. After these measurements we can say that the values of index can represent a certain basis for formulating the policies focused on the dimensions of the economy, labour and skills. These policies can contribute to the development and growth of individual indicators forming the Digital economy scale index.

If the scale of the digital economy (through the Digital economy scale index) is high, it means that the digital economy's share in certain state can grow. This can ultimately lead to the growth of the state's entire economy. Conversely, if the level of its scale is low, the impact of the digital economy in the state decreases. If the state's economy grows, the digital economy may not contribute to this growth.

The scale of the digital economy varies across the examined countries. An interesting finding is the fact that the scale of the digital economy is not conditioned by the geographical or economic scale of the state. By scale, the digital economy is at a high level in countries such as the Czech Republic and Estonia. On the contrary, it is at a medium low level, for example in Spain.

In countries where the positive value of the regression coefficient of year-on-year differences was measured, there is potential for future growth of the digital economy and thus growth in its overall impact on the state's economy. Where a negative value of the regression coefficient was measured, there is a potential for a decrease in the scale of the digital economy and thus a decrease of its impact on states economy.

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Roman CHINORACKY is a doctoral student at the Faculty of Operation and Economics of Transport and Communications at the University of Žilina. His dissertation and research focuses on assessing the potential of digital technologies in the transformation of businesses, the economy and society.
ORCID ID: https://orcid.org/0000-0003-4183-5883

Tatiana COREJOVA is a university professor at the Faculty of Operation and Economics of Transport and Communications at the University of Žilina. Her scientific, pedagogical and publishing activity is focused on interaction of technological development and economy and management of network industries, optimization and rationalization of postal network and services, diagnostics of business environment including diagnostics of technological procedures, research of sectoral clusters of companies and network processes knowledge of global processes in the development of information and communication technologies and transport at regional level, in the business environment, regional dimensions of the knowledge economy and the creative economy.
ORCID ID: https://orcid.org/0000-0003-0775-940X **ResearcherID: R-3145-2019**

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EMPLOYMENT OF FOREIGN STUDENTS AFTER GRADUATION IN HUNGARY IN THE CONTEXT OF ENTREPRENEURSHIP AND SUSTAINABILITY

Janka Betáková [1], Jingjing Wu [2], Ildiko Rudnak [3], Robert Magda [4]

[1]DTI University, Sládkovičova ul. 533/20, Dubnica nad Váhom, 018 41, Slovakia
[2,3,4] Szent István University, Páter K. u. 1, 2100 Gödöllő, Hungary
[4]Vanderbijlpark Campus, North-West University, Vanderbijlpark 1900, South Africa

E-mails: [1] betakova@dti.sk [2] rmagda72@gmail.com; [3] Rudnak.Ildiko@szie.hu; [4] jingjing.wu.jj@gmail.com

Abstract. In recent decades, more and more international students, including paid and scholarship-funded students coming to study in Hungary, most of them are studying in higher education institutions. The experience of studying abroad has not only broadened foreign students' horizons, but also increased their entrepreneurial awareness to a certain extent, especially increased the number of foreign companies or businesses set up by foreign students to trade and cooperate with the host country. In this sense, they are moving forward to entrepreneurship. At the same time, entrepreneurial and sustainable education in universities also play a very important role in the development of international students' awareness. After graduation, some international students choose to stay and work in Hungary, while others choose to return to their home countries or work in other countries. The present study was conducted to understand whether overseas experience has sustainable influences on career development and employment choice of foreign students, testing whether their employment intentions have changed after studying in Hungary. Furthermore, whether international students' attributes have relationships with their employment intentions. In addition, it is necessary to explore the main reasons for choosing different employment intentions. For data analysis, descriptive statistics, Paired Sample T-test and Crosstabulation were used in SPSS. The overall results show that the experience of studying abroad does have a sustainable impact on the employment intention of foreign students, but due to the different attributes of foreign students, the reasons, effects and degrees of the influence are different.

Keywords: employment intentions; career choice; foreign students in Hungary; attributes of foreign students; entrepreneurship and sustainability

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JEL Classifications: I23, L26, J80

1. Introduction

Globalization provides rich new opportunities for higher education. The flow of international students is increasing, and every year more students are studying in universities outside their home countries. One result is the development of global universities, with students coming from a wide range of national, ethnic and cultural traditions. Today's universities are one of the most diverse organizations in the world, with representatives from dozens of countries among students, faculty and support staff (Harrison, 2012). One of the powerful driving forces behind internationalization of higher education in Europe is the goal of European labour markets aimed at creating a competitive labour market: companies are interested in recruiting talented people from larger labour forces (Tempus Public Foundation, 2018). On the opposite side, the research of Srovnalikova et al. (2018) showed that students are more interested in gathering practical information about business services that are relevant to business, or even more about gaining employment in information and communication companies. In addition, students with working experience in foreign countries are more likely to become self-employed and their proficiency in information and communication technology will also be improved (Pinto, 2020). Here, to succeed in an internationally competitive labour market, education must be strategically planned and adequate resources must be fully utilized (Tempus Public Foundation, 2018). Furthermore, it needs to be emphasized that inter-university mobility programs (such as the Erasmus Project) encourage more students to study abroad and have a causal and positive impact on becoming entrepreneurs (Pinto, 2020). This is because mastering a foreign language has a special impact on university students, who are positioned by the market as migrant workers with entrepreneurial spirit (Sabaté-Dalmau, 2020). At the same time, the overseas study program contributes to the sustainable development of education, that is, educational institutions make great efforts to adjust the management model, human capital and technology, as well as curriculum to meet the needs of mobile students (Bañegil-Palacios & Sánchez-Hernández, 2018).

Mosneaga & Winther (2013) believe that in the global competition for talent, international students are regarded as potential skilled workers. However, due to nationalism or national protectionism in some Western countries, international students are forced to return to their home countries (Xiong & Mok, 2020). Nor is it a policy goal for Hungary to retain international students here. International students will return to their motherland and disseminate good reputations for higher education in Hungary and promote Hungary's scientific economic and cultural links with each third country (European Migration Network, 2018). Here, according to European internationalization labour market demand, for enterprises to recruit internationally outstanding talents and Hungary retain international students as not a policy goal, we need to explore what is currently employment intentions of international students in Hungary. Whether they prefer to join the international labour market of Hungary or they are more likely to return to their home country or go to other foreign countries. Moreover, what kind of international students would be more willing to choose which employment intention? Whether international students' employment intentions have great relationships with their attributes and what are the main reasons of them to have different employment intentions, as well as the influence of studying abroad and university education on the entrepreneurship and sustainability of foreign students. In addition, our goal is to extend the present research to the V4 countries (Poland, Hungary, the Czech Republic and Slovakia) as well, as internationalization and the presence of international students are characteristic of all four countries, and further comparative studies with a number of sustainability-related findings may help innovative education in universities.

The research is based on the current international students in Hungary and collects data through a questionnaire survey. After analysis by SPSS software, the results show that the desire of international students to work in their own country does not change with the experience of studying in Hungary, but their desire to work in Hungary and other foreign countries have become stronger. Moreover, the age, working years and Hungarian proficiency of international students are the main attributes that affect their employment intentions. In addition, hoping to return to their own country to live is the main reason for returning to work. For employment in Hungary, international

students like the working environment and atmosphere in Hungary as the most important reason. While, foreign students who want to work in other foreign countries are more likely to go to better countries for economic development and social security. As the research on present topic about foreign students in Hungary is still limited in literature, it is necessary to explore the current employment intentions of them. This paper could provide references for employment choice of foreign students in Hungary and these results can provide data basis for the Hungarian government, universities and enterprises to learn more about foreign graduate students in Hungary from the perspective of sustainable development.

First of all, this study reviews the literature to understand the international education background of Hungary, the employment intentions and entrepreneurship of international students. Secondly, the methods and sample data used in this study are described in detail. Here, the collected data is analyzed mainly through descriptive statistics, Paired Sample T-test and Crosstabulation. After that, the research results are presented and compared with previous studies as well as discussed in depth. Finally, combined with the research results, this paper gives the research conclusions and suggestions.

2. Theoretical background

2.1 International educational background in Hungary

The premise of internationalization undoubtedly assumes that geographical mobility (such as the form of student study abroad programs) promotes the favorable success of higher education (HE) and increases the likelihood of career development (Sabaté-Dalmau, 2020). In addition, the traditional driving point for the demand for education, especially higher education (HE), is the realization of the expectation that it can improve the economic and social status of graduates (Mazzarol & Soutar, 2002). Therefore, correspondingly, the international or foreign enrollment of higher education (HE) in the world is increasing year by year, reaching 5.6 million in 2018, of which 3.9 million are attracted by OECD countries and 1.7 million by Non-OECD countries. The largest group of international or foreign students at all levels of higher education (HE) is from Asia, accounting for 57 per cent of all migrant students in the OECD in 2018. And then, China and India account for the largest proportion of all migrant students enrolled in OECD countries, contributing more than 30 per cent. The United States is the top destination for international students in OECD countries, accounting for 18 per cent of the global education market, followed by Australia and the UK (8% each) and Germany (6%) (OECD, 2020).

In Europe, Erasmus+ is a financial tool used to support the flow of international students with social policy objectives (Tempus Public Foundation, 2018). It signed in 2019 funded the mobility of nearly 505,000 students and faculty in higher education (HE) in Europe and other parts of the world. The launch of a series of cooperative projects has promoted the better use of ICTs in learning and teaching, and further strengthened the close links between higher education institutions, employers and society as a whole (European Union, 2020). In addition, in 2013, the Hungarian Government established a scholarship program, Stipendium Hungaricum (Tempus Public Foundation, 2018). Since the turn of the century, the number of foreign citizens in higher education (HE) in Hungary has been on the rise. From 11,783 students in 2011 to the academic year 2019/2020, we have seen a 3.5-fold increase in this number, which is 326% of the previous figure, that means there are 38,422 international students (Tempus Public Foundation, 2020). In the choice of majors, the proportion of foreign students in medical and agricultural education is higher, while the proportion in science and social sciences is relatively low. Among the international students participating in degree programs, China has the largest number of students, more than 1,000. However, the growth rate of medical students is slowing, with German students accounting for the largest proportion of this group (Tempus Public Foundation, 2018).

2.2 Employment intentions of International students

Compared with ever before, talent is also mobile. Many of the most talented people can make choices and are willing to move to any place where they can maximize their talent (Wang & Liu, 2016). To some extent, the geographical mobility of all students combines the boundaries of academic and early career trajectories (Sabaté-Dalmau, 2020). However, today's international students face decisions not only about where to work but also about their career decisions, including thoughtful consideration of the cultural factors of their home and host countries, lifestyle choices and thinking about a better future (Arthur & Flynn, 2011). After that they may face a dilemma in their initial path choice because they want to seek the best future, or later when they realize that their first choice did not come true as expected (Tharenou, 2015). The career outcome and response of graduates who remain employed in the host country may affect whether they are repatriated or emigrated to a third country in the future (Tharenou, 2015).

The combination of international residential migration, labor market mobility and educational mobility can be seen as a conceptual study of staying abroad (Netz & Jaksztat, 2017). Parey & Waldinger (2011)'s results show that students' behaviour in labour market mobility decisions may be potentially affected by educational mobility programs. For example, Pinto (2020) found that the possibility of working abroad would be increased by participating in the Erasmus program while studying in Spain. Similarly, Kronholz & Osborn (2016) believe that significant positive changes have taken place in the professional identity assessment reported by university students before and after studying abroad, such as the experience of studying abroad can expand students' opportunities to work and live abroad (Brooks et al., 2012), bring them positive returns, promote their job search and career development (Nilsson & Ripmeester, 2016; Xiong & Mok, 2020). However, Waibel et al. (2017) propose that only one-fourth or less of respondents reported any actual career changes after their stay abroad. This suggests that studying abroad may be more likely to reaffirm and advance a chosen career path than to cause individuals to fundamentally question their original career plans.

Brooks et al. (2012)'s research shows that many foreign students are more willing to cross their own borders and look for jobs and career development in other countries or regions with good opportunities. The results of the Imran et al. (2011)'s study of Pakistani medical graduates show that respondents want to emigrate because they believe that overseas training will have a positive impact on their future careers in order to have a competitive advantage in a saturated job market. This leads to economic security, better working conditions and training experience. In addition, Tharenou (2015) and Mosneaga & Winther (2013) propose that culture shock and cross-cultural adjustment are most likely to occur when international students first enter the host country and have been managed to a large extent during their studies. Therefore, the reasons why international students stay in the host country are more likely to be related to their employment and assimilation, rather than venturing to other places to start a new life.

Nevertheless, the reasons why international students leave the host country after graduation are more dominant in the job market and access to the job market (including the ability to speak local languages) than other factors (Nilsson & Ripmeester, 2016). Some students return home with the human capital (knowledge) they have acquired abroad, perhaps for the sake of higher wages and family ties in their home country, or for the attraction of government incentives (Naito & Zhao, 2020). In examining the trend of international human capital flows in China, it is noted that in the 2000s, China's economic success and subsequent social changes enabled China to effectively promote the flow from provider to recipient. As a result, China is now seen as a land full of opportunities and many overseas Chinese have returned to China (Gill, 2010). According to the statistics of Chinese Ministry of Education, the number of high-quality overseas Chinese graduates returning home has been growing steadily from 1978 to 2017 and a total of 3.132 million students returned home after graduation, accounting for 83.73 percent of the total number of students studying abroad (Ministry of Education, 2017). Grogger & Hanson (2015) examined the location choices of foreign-born students after obtaining a doctorate from

an American university and stated that if there is strong GDP growth in the US economy in recent years, or if GDP growth in the country where foreign students are born is weak, then foreign students are more likely to stay in the United States. Foreign students are less likely to stay in the United States if they come from a country with a higher average income or a country that has recently been democratized.

2.3 Entrepreneurship of International students

The establishment of enterprises is an important aspect of promoting national development, which helps to spread innovation, create jobs, improve competitiveness, enhance social cohesion and well-being, so entrepreneurial behavior has become an indispensable condition for economic growth (Fernandes et al., 2018). Pinto (2020)'s research shows that participating in the Erasmus project has a causal and positive impact on becoming an entrepreneur. This is due to the mastery of foreign languages has a special impact on university students, who are positioned by the market as mobile employees with entrepreneurial spirit. Their employment opportunities depend on their self-fulfilling competitiveness and flexibility in the mobile market as well as their sense of self-responsibility for foreign language skills (Sabaté-Dalmau, 2020).

In addition education policy plays a vital role in fostering and promoting graduates' entrepreneurial intentions (Wu & Wu, 2008; Pinto, 2020; Tung et al., 2020; Omer & Aljaaidi, 2020). According to the career preferences of international students, the governments of Beijing, Shanghai, Zhejiang and other places have also implemented a series of policies to attract them to return home to contribute to the local economy, such as providing generous subsidies and venture capital to international students (Mok et al., 2020). Furthermore, by exploring the impact of mobility actions in Spain on labor market outcomes and skill development, the author concludes that the probability of foreign students becoming entrepreneurs, working abroad and the improvement of information communication and communication skills has a positive impact after studying abroad (Pinto, 2020).

3. Research description and methodology
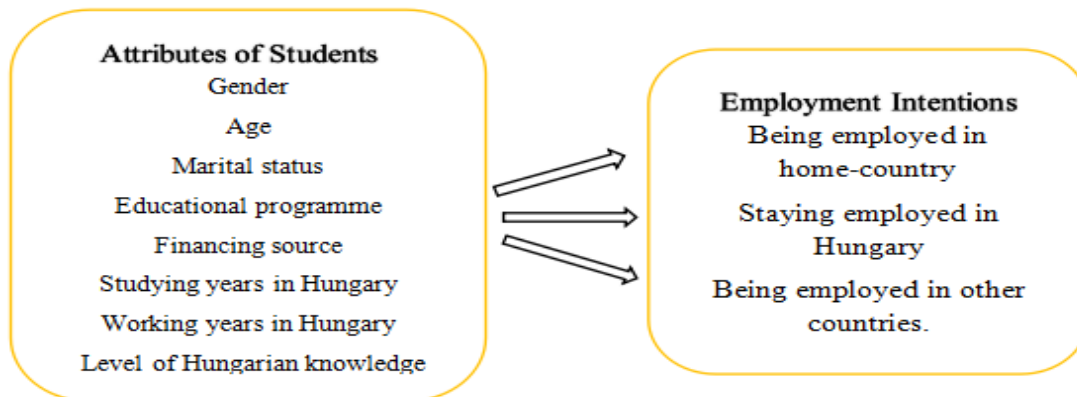
Figure 1. The Model of Theoretical Framework

Source: Own construction (2021)

From the above model (Figure 1), we can see that there are two variables in this study. They are attributes of students variables and employment intentions variables.

This paper used SPSS (version 26.0, IBM Corp., Armonk, NY, USA, 2019) to analyse the data and we divided the data analysis into four sections. The first section is a descriptive analysis of basic information of international students in Hungary, so the descriptive statistics method was used in SPSS. Then, the second section is to analyse whether there is a big difference in the employment intentions of foreign students before and after studying in

Hungary, here we used Paired-Samples T-Test. The third section is to evaluate whether there are significant relationships between different attributes of international students and different employment intentions. We used the Crosstabulation tool to analyse the relationship between gender, age, marital status, educational program, financing sources, studying years in Hungary, working years in Hungary, level of Hungarian knowledge and three types of employment intentions. In addition, we also found out the preference of employment intentions of international students with different attributes. The last section explores the main reasons for choosing different employment intentions, and here we used descriptive statistical analysis again.

In order to achieve the main purpose of this study, the next step will be the statistical analysis of the data obtained. We put forward the following assumptions for this study:

H1: There is no difference in employment intentions of foreign students to be employed in home-country between before and after studying in Hungary.
H2: There is no difference in employment intentions of foreign students to stay employed in Hungary between before and after studying in Hungary.
H3: There is no difference in employment intentions of foreign students to be employed in other foreign countries between before and after studying in Hungary.
H4: There is a significant relationship between the different attributes of foreign students in Hungary and their employment intention to be employed in home-country.
H5: There is a significant relationship between the different attributes of foreign students in Hungary and their employment intention to stay employed in Hungary.
H6: There is a significant relationship between the different attributes of foreign students in Hungary and their employment intention to be employed in other foreign countries.

We undertook the research work and collected data in the form of a survey. This study designed a questionnaire based on the current studying experience in Hungary and research literature of many scholars, combined with the hypothesis and purpose of this paper. The data of this questionnaire were collected through an electronic questionnaire filled out online. According to Tempus Public Foundation (2020), there are 38,422 international students in Hungarian higher education by the academic year 2019/2020. Among them, with the help of the students studying in different universities in Hungary, we collected 448 valid questionnaires that met the requirements of the analysis, and the number of valid responses accounted for 1.17% of the total number of international students in Hungary.

The questionnaire is divided into three parts: The first part is the basic information of international students currently in Hungary, including gender, age, marital status, educational program, financing source, studying years in Hungary, working years in Hungary, level of Hungarian knowledge and so on. The second part mainly studies whether the international students in Hungary have changed their employment intentions after studying in Hungary. Here, employment intentions are divided into three directions, they are being employed in home-country, staying employed in Hungary and being employed in other foreign countries. The sample questions including "Before studying in Hungary, I would like to work in my home-country" "After studying in Hungary, I would like to work in Hungary" and the respondent could choose from 1 to 5 (1= not at all, 5= extremely). The third part is the reasons why international students choose different employment intentions. Sample questions includes "After studying abroad, I will get more job opportunities when I return home." "I mastered the Hungarian language and I could easily find a good job." The questions in this part are based on the degree of consent, which are divided into strongly disagree, disagree, moderate, agree and strongly agree. The corresponding scales are 1 to 5.

4. Results of Research

4.1 Demographic Analysis of the Sample

Through the descriptive analysis of SPSS, the following figures reflect the basic information about the respondents' gender, age, marital status, educational program, financing source, studying years in Hungary, working years in Hungary and the level of Hungarian knowledge. As follows,

Gender: Female participants were higher than male participants, compared with 56.7% females and 43.3% males.

Age: Most participants were younger than 23 years old (44.6%), followed by 24-28 years old (35.7%), but more than 29 years old (19.6%) were relatively fewer (Figure 2).
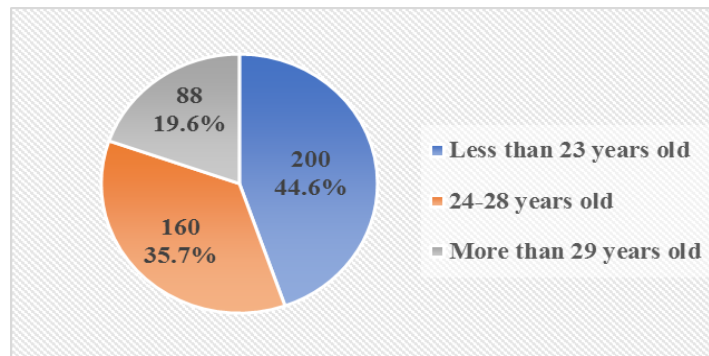
Figure 2. Sample Character of Age

Source: Own construction (2021)

Marital status: 88.8% of participants were single, while fewer participants were married and divorced/widowed, with 10.7% and 0.4% respectively.

Educational program: Most participants are involved in the degree program, with 44.4% of participants studying Bachelor course in Hungary followed by Master courses 37.1% and Doctoral participants 15.2%. Besides, participants in non-degree courses were 3.4% in total (Figure 3).
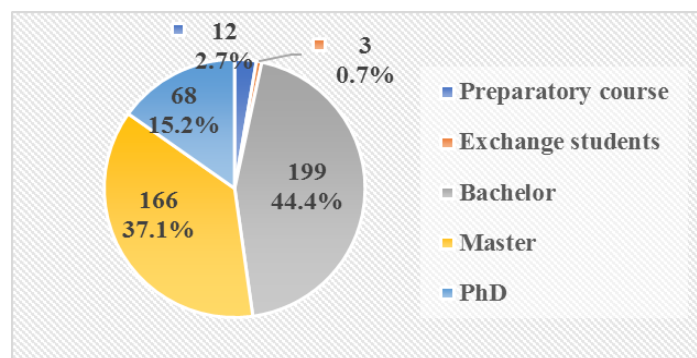
Figure 3. Sample Character of Educational program

Source: Own construction (2021)

Financing source: 66.7% of participants were awarded scholarships for studying in Hungary, whose number was twice as large as 33.3% participants at their own expense.

Study years: Participants mainly have been studying in Hungary for 2-3 years (47.8%), some participants have been studying for less than one year (38.4%). However, there were fewer participants with more than four years of study (13.8%).

Work years: Only about 30.4% of participants had worked in Hungary, including less than one year (21.2%), 2-3 years (7.8%) and more than four years (1.4%), while about 69.6% of participants did not have any work experience during their studies in Hungary (Figure 4).
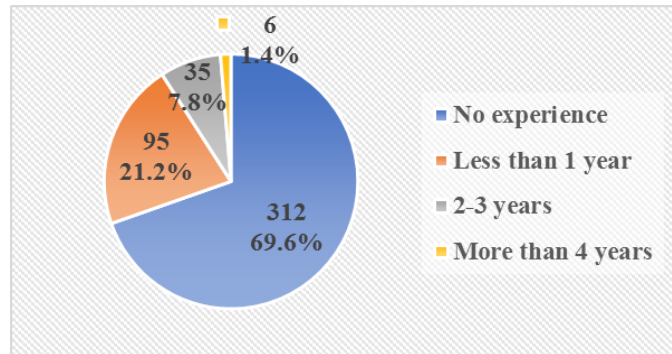
Figure 4. Sample Character of Working years

Source: Own construction (2021)

Level of Hungarian knowledge: Most participants studying in Hungary do not speak Hungarian accounting for 69.4%, while about 30.6% of participants can speak Hungarian, but few participants speak Hungarian proficiency accounting for only 0.9% (Figure 5).
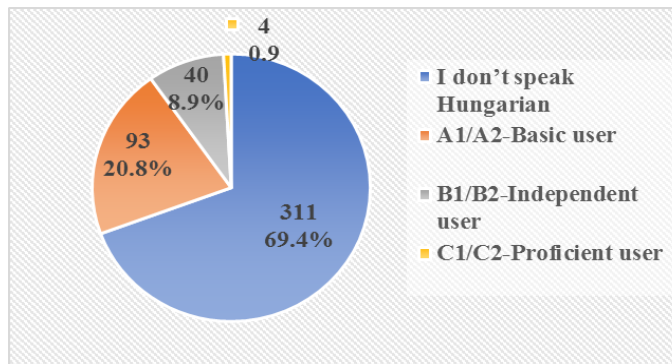
Figure 5. Sample Character of Hungarian knowledge level

Source: Own construction (2021)

4.2 Reliability

Here, Cronbach's alpha test was used to check the reliability of the scale. The ideal value of Cronbach alpha coefficient for a scale is greater than 0.7 (DeVellis, 2016). As can be seen from Table 1 that the employment intentions of international students before and after studying in Hungary include being employed home-country, staying employed in Hungary and being employed in other foreign countries. Their Cronbach Alpha values are 0.747, 0.708 and 0.786, respectively, suggesting that the items are considered acceptable, so the survey data are expected to produce pragmatic results.

Table 1. Cronbach's Alpha Reliability

Before- After studying in Hungary	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Being employed in home-country	0.747	0.747	2
Staying employed in Hungary	0.708	0.709	2
Being employed in other foreign countries	0.786	0.786	2

Source: Own construction (2021)

4.3 The difference in the employment intentions of foreign students before and after studying in Hungary

According to the results of the Paired-Sample T-Test, Table 2 shows that the P-value of being employed in home-country is greater than 0.05, while the P-values of employment in Hungary and other foreign countries are less than 0.05. As Sig. (2-tailed) are significant at 5% level of significance ($p<0.05$), so we conclude that there is no significant difference for foreign students' employment intention in their own country before and after studying in Hungary ($p>0.05$). However, there is a significant difference for being employed in Hungary and in other foreign countries ($p<0.05$).

By comparing the mean values of the three employment intentions, the results show that international students have the strongest desire to return to their own country for employment, followed by being employed in other foreign countries and lastly employment in Hungary.

Furthermore, before and after studying in Hungary, the largest gap in the willingness of international students is to stay employed in Hungary (0.34), followed by employment in other foreign countries (0.30) and then employment in their own country (0.09). These means that after studying in Hungary, the willingness of international students to stay and work in Hungary has increased most obviously, and the willingness to work in other countries has also been correspondingly increased, but the willingness to return to their own country has not been changed much.

Table 2. Paired Samples T-Test for employment intentions foreign students before and after studying in Hungary

	Comparison of employment intentions **before** and **after** studying in Hungary	Mean	Paired Differences Mean	Std. Deviation	Sig. (2-sided)
Pair 1	Be employed in home-country---**Before** Be employed in home-country---**After**	3.64 3.55	0.09	1.174 1.187	.075
Pair 2	Stay employed in Hungary---**Before** Stay employed in Hungary---**After**	2.54 2.88	0.34	1.227 1.279	.000
Pair 3	Be employed in other foreign countries---**Before** Be employed in other foreign countries---**After**	2.89 3.19	0.30	1.296 1.322	.000

Source: Own construction (2021)

4.4 The relationship between different attributes of international students and different employment intentions before studying in Hungary

Here, we used Crosstabulation Test to detect whether there are relationships between variables. If Pearson Chi-square significance (p) is less than 0.05, there exists a significant relationship between variables. In order to facilitate viewing and analysis, we deleted variables with P-values greater than 0.05 from the Table 3 and Table 4, and only meaningful variables are retained (P< 0.05). As shown in Table 3, the P-values of the age, marital status,

educational program, working years and Hungarian knowledge level of the participants are less than 0.05, so some of the attributes of the participants have a significant relationship with their employment intentions to work in their home country and to stay employed in Hungary before coming to study in Hungary.

Furthermore, participants aged over 29 who were studying for doctorates are more likely to work in their own countries. In addition, participants with no work experience or less than one year of work experience and those who do not speak Hungarian or only have the Hungarian level of A1/A2 are more likely to work in their own countries after graduation. With regard to employment in Hungary, single participants at the ages of 24-28 are more likely to stay in Hungary. Besides, participants who are studying for Bachelor and Master's degrees with more than two years of work experience prefer to stay in Hungary for employment.

Table 3. Crosstabulation Test of students' attributes and employment intentions before studying in Hungary

Before studying in Hungary		1	2	3	4	5	Pearson Chi-Square Asymptotic Significance (2-sided)
Being employed in home-country							
Age	Below 23 years old	2.0%	6.0%	39.6%	28.1%	24.1%	
	24-28 years old	7.6%	15.2%	24.1%	19.0%	34.2%	.000
	Over 29 years old	11.4%	6.8%	17.0%	27.3%	37.5%	
Educational Programme	Preparatory course	0.0%	0.0%	75.0%	16.7%	8.3%	
	Exchange students	0.0%	0.0%	50.0%	50.0%	0.0%	
	Bachelor	3.5%	9.0%	36.7%	26.1%	24.6%	.001
	Master	7.3%	12.2%	22.0%	20.1%	38.4%	
	PhD	10.3%	5.9%	19.1%	32.4%	32.4%	
Work years	No experience	3.9%	6.8%	29.9%	26.7%	32.8%	
	Below 1 year	5.3%	16.8%	28.4%	21.1%	28.4%	
	2-3 years	18.2%	12.1%	30.3%	21.2%	18.2%	.000
	Over 4 years	50.0%	16.7%	33.3%	0.0%	0.0%	
Staying employed in Hungary							
Age	Below 23 years old	14.1%	39.2%	27.6%	15.1%	4.0%	
	24-28 years old	30.4%	19.0%	22.8%	17.7%	10.1%	.000
	Over 29 years old	39.8%	10.2%	25.0%	15.9%	9.1%	
Marital status	Single	22.8%	28.6%	26.3%	16.7%	5.6%	
	Married	43.8%	8.3%	18.8%	8.3%	20.8%	.000
	Divorced/windowed	0.0%	0.0%	0.0%	100.0%	0.0%	
Educational Programme	Preparatory course	16.7%	33.3%	33.3%	16.7%	0.0%	
	Exchange students	0.0%	0.0%	0.0%	100.0%	0.0%	
	Bachelor	14.1%	35.7%	30.2%	16.1%	4.0%	.000
	Master	31.1%	19.5%	20.1%	17.7%	11.6%	
	PhD	44.1%	14.7%	23.5%	10.3%	7.4%	
Work years	No experience	25.1%	28.0%	25.7%	14.8%	6.4%	
	Below 1 year	30.5%	27.4%	18.9%	14.7%	8.4%	.000
	2-3 years	12.1%	12.1%	39.4%	36.4%	0.0%	
	Over 4 years	0.0%	0.0%	33.3%	0.0%	66.7%	

Source: Own construction (2021)

4.5 The relationship between different attributes of international students and different employment intentions after studying in Hungary

Table 4 shows that after studying in Hungary, there are significant relationships between the different attributes of the participants and three different employment intentions (p<0.05). Specifically, the P-values for working years and Hungarian level of participants who were willing to work in their own countries are both 0.000. For participants who would like to work in Hungary, the P-values for their gender and working years in Hungary are 0.001, and the P-values for financing source and level of Hungarian language are 0.000. Besides, the P-values of age and financing source of participants who would like to be employed in other foreign countries are 0.010 and 0.003, respectively. Therefore, we conclude that there is a relationship between the two.

In detail, after studying in Hungary, participants with no work experience or less than one year of work experience are more likely to work in their own country, and most of the participants with 2-3 years of work experience have a moderate attitude towards going back to their home country for employment. Participants with more than 4 years of work experience are likely to be reluctant to go back home to work at all. Participants who do not speak Hungarian or Hungarian level in A1/A2 prefer to work in their own countries, while most of the participants who speak Hungarian in B1/B2 maintain a neutral attitude, but those with higher Hungarian level in C1/C2 are more reluctant to work at home-country. For those who want to stay and work in Hungary, female participants are more likely to do that than male participants and participants with scholarships to study in Hungary are more likely to do so. With the increase in the number of years of work in Hungary, the desire of participants to work in Hungary has become stronger. In addition, from the perspective of mastering the level of Hungarian, the participants with higher proficiency in Hungarian are more willing to stay and work in Hungary. Concerning employment in other foreign countries, participants over the ages of 29 are more willing to do so. Moreover, compared with self-financed students, scholarships students are more likely to work in other foreign countries.

Table 4. Crosstabulation Test of students' attributes and employment intentions after studying in Hungary

After studying in Hungary		1	2	3	4	5	Pearson Chi-Square Asymptotic Significance (2-sided)
Being employed in home-country							
Work years	No experience	3.5%	8.0%	26.7%	31.8%	29.9%	
	Below 1 year	14.7%	8.4%	34.7%	25.3%	16.8%	.000
	2-3 years	12.1%	21.2%	42.4%	6.1%	18.3%	
	Over 4 years	83.3%	16.7%	0.0%	0.0%	0.0%	
Level of Hungarian Knowledge	Don't speak Hungarian	6.5%	9.7%	23.4%	30.2%	30.2%	
	A1/A2-Basic user	9.7%	8.6%	39.8%	23.7%	18.3%	.000
	B1/B2-Independent user	10.0%	0.0%	52.5%	25.0%	12.5%	
	C1/C2-Proficient user	25.0%	75.0%	0.0%	0.0%	0.0%	
Staying employed in Hungary							
Gender	Male	16.7%	24.5%	27.1%	26.6%	5.2%	
	Female	19.0%	19.8%	26.1%	17.4%	17.8%	.001
Financing source	Self-financed	20.8%	32.9%	30.2%	10.7%	5.4%	
	Scholarship	16.6%	16.2%	24.7%	26.7%	15.9%	.000
Work years	No experience	19.6%	24.4%	24.8%	19.6%	11.6%	
	Below 1 year	17.9%	17.9%	30.5%	24.2%	9.5%	.001
	2-3 years	6.1%	6.1%	36.4%	33.3%	18.2%	
	Over 4 years	0.0%	33.3%	0.0%	0.0%	66.7%	
Level of Hungarian	Don't speak Hungarian	22.1%	25.0%	22.4%	20.1%	10.4%	

Knowledge	A1/A2-Basic user	11.8%	17.2%	33.3%	23.7%	14.0%	
	B1/B2-Independent user	2.5%	10.0%	45.0%	27.5%	15.0%	.000
	C1/C2-Proficient user	0.0%	0.0%	0.0%	0.0%	100.0%	
Being employed in other foreign countries							
Age	Below 23 years old	16.6%	15.6%	32.2%	19.6%	16.1%	
	24-28 years old	16.5%	20.3%	22.8%	24.7%	15.8%	.000
	Over 29 years old	2.3%	18.2%	14.8%	25.0%	39.8%	
Financing source	Self-financed	26.2%	16.8%	28.9%	16.1%	12.1%	.000
	Scholarship	7.4%	18.2%	23.6%	25.7%	25.0%	

Source: Own construction (2021)

4.6 The main reasons for the choice of employment intentions after studying in Hungary

Through descriptive statistics, we ranked the mean value of the main reasons why international students choose different employment intentions after studying in Hungary. As shown in Table 5, we mainly list the reasons for ranking in the top 5 and believe that they are the main reasons for determining the employment intentions.

Specifically, the main reason for international students who prefer to return to their home countries for employment is that they hope to live in the country where they were born, with a mean value of 4.25. Secondly, they can get more job opportunities (4.19) and think that the familiar social environment makes them feel more comfortable (4.14) and belonging (4.10). Lastly, they need to take care of their families, which is 4.03. Besides, we further conclude that after graduating from Hungary, the mean values of the first five reasons why international students choose to work in their own country are all greater than 4.0, and the difference between the maximum value and the minimum value is 0.22.

For international students who are willing to stay and work in Hungary, they like the working environment and atmosphere in Hungary, with 3.75. After that, the living conditions, social security (3.56), cultural and social environment of Hungary (3.51) are also the main reasons for attracting them. In addition, staying and working in Hungary is of great help to international students to increase work experience (3.49) and realize personal ambitions (3.36). The mean values of the first five reasons for international students choosing to work in Hungary are all greater than 3.0 but less than 4.0, and the difference between the maximum and the minimum is 0.39.

Moreover, the most important reason why Hungarian international students want to work in other foreign countries is that they are more willing to go to countries with better economic standards and social security, which is 4.28. Secondly, they want to broaden their horizons and experience different cultural environments (3.92). A good business environment (3.87) and a variety of job choices (3.73) are also important reasons.

Similar to the reason for international students who want to stay and work in Hungary, they try to improve their work experience in foreign countries to help them find a good job (3.66) when they return home in the future. Here, the mean values of the first five reasons for choosing to work in other foreign countries are all between 4.5 and 3.5, but the difference between the maximum and the minimum is the largest, which is 0.62.

Table 5. Descriptive statistic of main reasons for the choice of employment intentions after studying in Hungary

Being employed in home-country	Mean Rank	Std. Deviation
I hope to live in my own country after graduating from studying in Hungary.	4.25	.972
After studying abroad, I will get more job opportunities when I return home.	4.19	.830
The familiar social environment of my own country makes me very comfortable.	4.14	1.077
Working in my own country gives me a sense of belonging.	4.10	1.022
I have the responsibility of taking care of my family, so I need to go back to work in my own country.	4.03	1.103
The mean of all items	**4.142**	1.001
Staying employed in Hungary	**Mean Rank**	**Std. Deviation**
I like Hungary's working environment and working atmosphere.	3.75	.863
Living conditions and social security in Hungary are better.	3.56	1.099
I love Hungary's cultural and social environment very much. I would like to settle down in Hungary after graduation.	3.51	.966
Work experience in Hungary can help me find a better job when I return home country.	3.49	1.090
Hungary has the conditions to realize my personal ambition.	3.36	1.091
The mean of all items	**3.534**	1.022
Being employed in other foreign countries	**Mean Rank**	**Std. Deviation**
I would like to work in other countries with better economic development and social security so that I can get more income.	4.28	.842
I would like to work in other countries because I want to go to a new environment. This can broaden my horizons, let me feel other countries' humanities customs.	3.92	.961
I would like to go to a country with a better business environment, which is conducive to the development of my career.	3.89	.892
The choice of employment in other foreign countries is diversified.	3.73	.963
Working experience in other foreign countries can help me find a good job when I return home.	3.66	1.064
The mean of all items	**3.896**	0.944

Source: Own construction (2021)

5. Discussion

By using Paired Samples T-Test to analyze employment intentions before and after international students studying in Hungary, we could test the first three hypotheses proposed earlier. According to P values of Paired Samples T-Test, we conclude that there is no significant difference in employment intentions of international students to be employed in home-country between before and after studying in Hungary, so H1 is not accepted. That is, studying in Hungary has not changed the desire of international students to work in their own country. This result can be related to the research results of Waibel et al. (2017), who concluded that studying abroad may be more likely to reaffirm and promote a selected career path rather than any actual career path change, and the reasons can be explained by the fact that international students with families or other strong relationships in their home countries are expected to reduce the likelihood of considering and planning migration due to expected economic, social and emotional costs (Kley, 2011). However, there exists a great difference in employment intentions to stay employed in Hungary and to be employed in other foreign countries, so H2 and H3 are

acceptable. Those indicate that great changes have taken place in international students' thinking about employment in Hungary and employment in other foreign countries after studying in Hungary. This result is consistent with Parey & Waldinger (2011) and Kronholz & Osborn (2016) that studies abroad affect career choices. Moreover, no matter before or after studying in Hungary, most of the international students prefer to work in their own countries, followed by other foreign counties, while the willingness to work in Hungary is not strong enough. Soon (2012)'s research on this view shows that international students who initially intend to return home are more likely to maintain this intention and reduce the likelihood of going to other places. However, after studying abroad, international students' willingness to stay in Hungary has increased, which has contributed to recruiting foreign workers in Hungarian companies, thereby enhancing the diversification level of enterprises.

Through Crosstabulation Test, we examined whether international students' attributes have great relationships with their employment intentions. Here, we mainly verify if the latter three hypotheses previously proposed are accepted. The relationship analysis shows that before studying in Hungary, international students' age, educational programs, years of working and level of mastering Hungary are related to employment in their own countries. After studying in Hungary, international students' working years and level of Hungarian knowledge also have relationships with their intention to work in their own country. Therefore, we infer that most of the attributes of international students are related to employment in their own country so that H4 is accepted. For employment in Hungary, the age, marital status, educational program and years of working are associated with their intention to stay employed in Hungary before coming to Hungary for studying. After studying in Hungary, their age, financing sources, working years and mastery of Hungarian levels have relationships with their intention of employment in Hungary, therefore H5 is also accepted. Lastly, table 3 does not show any data for any attribute of international students with employment in other foreign countries because we deleted data with P-value greater than 0.05. So, we could conclude that before studying in Hungary, there is no significant relationship between international students' attributes and willingness to work in other foreign countries. However, after studying in Hungary, only international students' age and financing source have relationships with their desire to seek employment in other foreign countries. Then, we judge that there is no significant relationship between the variables and H6 is not accepted.

Combined with before and after studying in Hungary, firstly, we found that age, working years and Hungarian knowledge level are the most important attributes that affect the employment intentions of international students. International students over the age of 29 prefer to work in their own country or work in other foreign countries rather than in Hungary. Then, the more years of international students have worked in Hungary, the more reluctant to return their own country to work, and they are more likely to choose to work in Hungary, especially international students with four years of work experience. Cameron et al. (2019) also pointed out that many international graduates have taken part-time jobs in the host country during their studies. They choose to work in the host country because they are generally familiar with the relevant cultural norms. Besides, with the higher the proficiency of the Hungarian language, the students are more unwilling to return to their own countries for employment and they prefer to work in Hungary. Nilsson & Ripmeester (2016) also believed that the capability of international students to speak the local language required by the job market of the host country is more advantageous than other factors. Secondly, the attributes that have an impact on the employment intentions of international students are educational programs and financial sources. International students with higher levels of education (masters and doctorates) are more likely to work in their own countries rather than in Hungary. However, Soon (2012)'s study of foreign students in New Zealand showed that doctoral students are less likely to choose to work in their own country, but are more likely to choose other countries / the UK as their intended destination country. In addition, international students in Hungary who have won scholarships are more likely to work in Hungary or work in other foreign countries than self-financed students. Lastly, the remaining attributes are the gender and marital status of international students, but these attributes do not have a great impact on the choice of employment intentions, but they can also be used as reference factors. That is, female international students are more willing to work in Hungary than men, and the same of married international students.

In addition to testing the above hypotheses, this paper also explored the reasons for choosing different employment intentions after studying in Hungary. Compared with the three employment intentions, we found that the mean value of all items of employment in home-country is the highest, which is Σ4.142. This is followed by employment in other foreign countries (Σ3.896) and employment in Hungary (Σ3.534). These indicate that international students in Hungary have a high degree of recognition for the same reasons for choosing to return to their own countries for employment, followed by employment in other foreign countries. However, the recognition of international students who stay employed in Hungary for the same reason is relatively low. In addition, what is interesting is that the mean ranking of the reasons for choosing three different employment intention is the same as the mean ranking order of choosing employment intentions before and after studying in Hungary.

Conclusion and Suggestion

For both the home country and the host country of foreign students, it is imperative for policy makers to understand the employment intentions of foreign students (Soon, 2012). Rowthorn (2008) believed that international students are highly skilled foreign workers who account for almost all of the contribution of international workers to the economy of the host country. In addition, the view of the labor market of the host country has a great influence on the intention of international students to stay in the host country after graduation (Baruch et al., 2007). Here, Blackmore et al. (2017)'s advice for international graduates planning is that to stay in host country is not only to comply with the immigration policies of the host country, but also to understand the more subtle rules and expectations of the local labour market, such as different cultural preferences and social fields.

Moreover, the excellent language skills generated by studying abroad can bring sustainable advantages to entering the labour market because it is an attractive selection criterion for employers, which in turn enhances the sustainability of their employment (Choi et al., 2020). In addition, entrepreneurial education has a great and positive impact on entrepreneurial self-efficacy and students' attitude towards entrepreneurship as well as needs more support from the government to promote the development of entrepreneurial activities (Tung et al., 2020). Therefore, the role of universities in entrepreneurship education programs is crucial. The creation of entrepreneurship and training programs can promote and support students' entrepreneurial behavior, that is, students' entrepreneurial skills will be improved, thus further putting knowledge into practice (Fernandes et al., 2018).

This article could provide some data reference for policy makers of Hungarian government, universities, and enterprises. Therefore, the Hungarian government could adjust the educational mobility program or take further actions, universities could strengthen the training of international students in Hungarian, career skills and entrepreneurial awareness. At the same time, for Hungarian enterprises that would like to improve the level of diversification, they need to provide more internship opportunities for international students, so as to enhance the work experience of international students. In this way, they will also be more willing to stay and work in Hungary.

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Janka BETÁKOVÁ, assoc. prof., Ing. Arch. PhD., is the asscoiated professor of Management at DTI University, Dubnica nad Váhom, Slovakia. Her research interest is focused on management, regional and space management and marketing. She publishes a number of publications, both in domestic and international journals and she is a co-author of scientific monograhps. She has participated in several domestic and international scientific projects.
ORCID ID: orcid.org/0000-0002-9317-6317

Róbert MAGDA prof., PhD., is a professor, at Szent István University, Faculty of Economics and Social Sciences, Institute of Economics, Law and Methodology and an extra ordinary professor at School of Management Sciences Faculty of Economic and Management Sciences, North-West University, South Africa. During his research activities, he has gained insight into several fields of research, which include but are not limited to the following: the examination of land as a natural and economic resource; different modes of land use; the economic role of natural resources; the economic potentials of rural areas; limited resources and sustainability. In these research areas, he published a series of publications with his colleagues and students, both in domestic and international journals and books.
ORCID ID: orcid.org/0000-0001-9350-6673

Ildikó RUDNÁK, assoc. prof., PhD., is an associate professor at Szent István University, Faculty of Economics and Social Sciences. Her main field of research is multiculturalism, organizational culture, training – coaching, culture shock, labour market, which ones she examines mainly in an international context from the perspective of globalization. Her numerous publications have appeared in domestic and international journals and conference proceedings, she is supervisor of several doctoral students.
ORCID ID: orcid.org/0000-0003-1352-2126

Jingjing WU, PhD-student of Doctoral School in Economics and Regional Studies at Szent István University, Faculty of Economics and Social Sciences. She got the master's degree in management and leadership at Szent István University. Her research field is the multicultural management styles of Chinese enterprises and international labor market.
ORCID ID: orcid.org/0000-0002-4502-2460

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UNDERSTANDING THE NATURE OF THE ECONOMIC GAME ULTIMATUM THROUGH THE PRISM OF PERSONALITY TRAITS[*]

Pavel Ziaran [1], Radovan Bacik [2], Beata Gavurova [3], Richard Fedorko [4]

[1,2,4] University of Prešov, Faculty of Management, Konštantínova 16, 080 01 Prešov, Slovakia
[3] Technical University of Košice, Faculty of Mining, Ecology, Process Control and Geotechnologies, Letná 9, 042 00 Košice, Slovakia

E-mails:[1] pavel.ziaran@unipo.sk; [2]radovan.bacik@unipo.sk; [3]beata.gavurova@tuke.sk; [4]richard.fedorko@unipo.sk

Abstract. Ultimatum game belongs to the classical economic experiments, frequently used to study altruism and pro-social behavior. The objective of the research is to understand relations between the personality and the ultimatum game from the responder´s perspective. Participants (N=224, females 62%) filled the web-based questionnaires on Hexaco-PI and hypothetic minimal acceptable sum as respondents in the ultimatum game. Data was analyzed by means of the structural equation model and the binominal regression model, using the narrow traits as input variables. Interestingly, the most frequented value of minimal acceptable amount was a fair offer (50 % of the total sum). A fair offer was expected by 50 % of females and 42 % of males; what erodes the traditional thesis of economic rationality, according to which any offer higher than 0 should be accepted. Hence, people have natural tendency to expect and require a fair deal. Results from the logit model show that the minimal acceptable sum in the ultimatum game is predicted, firstly, by liveliness and sociability (wider trait extraversion) and secondly, by sentimentality and dependence (wider trait emotionality). In other words, tendency to expect and require fair offer manifests at optimistic and joyful people able to create strong emotional connections. Logit model´s results were reconfirmed by the structural equation models, where wider traits extraversion and emotionality were found statistically significant. Findings have interesting implications as regards the understanding of underlying psychological processes in the frame of altruistic decision-making.

Keywords: Ultimatum game; Hexaco-PI; personality; in-class experiment; altruistic behavior

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1. Introduction

Ultimatum game has been first proposed by Güth, Schmittberger & Schwarze (1982). This game is a form of an economic experiment on money distribution between two players: allocator (or proposer) and responder (recipient) and belongs to the group of bargaining games (used earlier e.g. by Lloyd, 1970). In the first step, allocator decides on the distribution of money between the two persons. If respondent agrees with the proposal, both will receive the money in the proposed extent. However, if responder does not agree, both will receive nothing. The game ultimatum is closely related to the dictator game, which consists only from the first step of the process.

Since 1960´s, economic games on money distribution (dictator, ultimatum, trust game, prisoners´ dilemma) received lot of attention from the research community, bringing insights and understanding on the aspects as altruism, fairness or cooperation (Camerer & Thaler, 1995). Analysis of economic experiments dictator and ultimatum by means of the Hexaco-PI was introduced by German professors Hilbig and Zettler and their collaborators. This is where inspiration for this research comes from. Relations between Hexaco-PI and the ultimatum game were analyzed in Hilbig & Zettler (2009), in the form of an ex-ante decision of the proposer, and by Hilbig et al. (2013) in the form of ex-ante decision of the responder.

Hexaco – Personality Inventory came into existence on the basis of the lexical analysis, out of which a personality model consisting of six factors was created (Ashton et al., 2004, Lee and Ashton, 2008). The corresponding HEXACO model of personality represents an acronym for the six factors Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience (Lee & Ashton, 2006).

The objective of this research is to analyze psychological aspects underlying the decision-making of the responder, based on the personality traits as defined by Hexaco-PI (Lee & Ashton, 2004), special focus is given on the gender differences. We believe that profound analysis of decision-making in the economic experiments might bring a valuable insight into understanding the human nature in the contemporary market-based society.

Aspects of the ultimatum game (not measured psychometrically)

The standard homo economicus model postulates that participants pursue their individual material interest and act rationally to achieve their goals. In such a case, the responder should accept any offer greater than zero from the proposer, and the proposer/allocator should make offers approaching zero (Rubinstein, 1982). However, these two predictions are rarely observed, and the empirical results differ dramatically from the predictions of the game theory, which assumes self-interest.

Camerer & Thaler (1995) denote this deviation from a purely rational (economic) behavior as an anomaly. Subsequently, this game provides an interesting ground to study the phenomena as altruism, reciprocity, cooperation and inter-individual justice.

Theoretically, there are two possible strategies for the allocator, to propose a fair or an unfair offer, and consequently, responder can provide four possible outcomes (accept / refuse a fair / unfair offer).

From the point of view of a proposer there are two motivations to offer a higher sum: first the notion of fairness or second, in the context of limited information and in the context of a bounded rationality, proposers raise their offers because they expect that non-satisfactory offers might be rejected (Suleiman, 1996).

Binmore, Shaked, & Sutton (1985) divide players in two groups, in the frame of the results of bargaining games, the people with the tendency to "play fair" and the people who behave selfishly and rationally like real economic agents. Similarly, Thaler (1988) points out that the fairness might play a significant role in determining the outcomes of negotiations and suggest two groups of players "fair men" and "games men". Fair men as proposer tend to choose 50-50 allocations, even when the risk of rejection is eliminated (e.g. in the dictator game).

Fehr & Gächter (2002) suggest that the reason why the responder rejects the sum smaller than 50 % is the altruistic teaching in the form of punishment where by means of rejection responder educates the proposer to behave in a more altruistic manner in the future.

As an antidote for the researchers bounded by the economic rationality there are scientists looking for authentic roots of human behavior using children as research subjects. Benenson et al. (2007) that children aged four, six and nine naturally manifest altruistic behavior in the frame of dictator game (distributing stickers); though the older children or those with higher socioeconomic status turn to be more altruistic.

Fehr et al. (2008), finds the children at the age of 3 to 4 behave much more selfishly, when compared to the group of children at the age 7 to 8. Furthermore, altruistic behavior manifests strongly among the children from the same social group (parochialism). Gummerum et al. (2010) confirmed similar results (dictator game, distributing stickers). Children aged 3 behave more selfishly than children at the age of 5 and girls were more altruistic than boys (for 5-years old girls the mode of distribution was 50 %).

Allgaier et al. (2020) carried out a classical ultimatum and dictator experiment with nine-years old children (N=164), who were distributing candies (10 chewy candies, in total). In both cases, the fair split occurred in 75% of cases at ultimatum settings and 50 % in the dictator setting. Some children made a hyper-fair offer (more than a half of candies): 5 % of children under the dictator setting and 14 % under the ultimatum. Authors found that honesty-humility (as defined by Hexaco-PI) predicts the distribution of all candies in both games; however, the distinction on the effects between the two games is not clear from the text.

Hexaco personality tests and the research of prosocial behavior in dictator/ultimatum

Hilbig & Zettler (2009) analyzed ultimatum score from the proposer / allocator´s perspective, by means of Hexaco-PI: correlation coefficient between the wider trait honesty-humility and the score in ultimatum was r = - 0.14; however this correlation was not statistically significant at the level $p < 0.05$ (two-sided). Similarly, as in our research the data were collected by means of the online questionnaire (N = 134). Authors further found statistically significant correlations between Honesty-Humility and dictator game (r = - 0.27) and the social value orientations (r = 0.25). Social value orientation (SVO) denotes a proportion of the prosocial choices in the games proposing different combinations of money distribution between the allocator/proposer and the responder (Van Lange et al., 1997).

In the dictator game experiment (N = 96), Hilbig et al. (2015) found following traits to be statistically significant: honesty-humility (r = 0.27 $p < 0.01$) and agreeableness (r = 0.19 $p < 0.05$). When using regression on all the 6 traits, besides honesty-humility, extraversion was the traits which contributed to the dictator game allocation.

In an ultimatum experiment, focused on the responder´s decision, Hilbig et al. (2016) allowed the responder to punish the proposer by the reduction of proposer´s payoffs. Amount of the payoff reductions was predicted by the agreeableness, as defined by Hexaco-PI, (r = - 0.27 p = < 0.05 N = 44), and not by the honesty-humility trait.

The research nearest to ours in its nature was carried out by Hilbig et al. (2013), who found positive relations between the ultimatum game and agreeableness (r = 0.19 $p < 0.01$ N = 212). With the same sample the score in the dictator game correlated with honesty-humility (r = 0.25 $p < 0.01$) and openness to the new experience (r = 0.15 $p < 0.05$).

Approaches to measure the score in the ultimatum game

Based on the literature review we can summarize, that the research on ultimatum game can be carried out in several forms. First, intention vs. actual decision. Secondly, focus on proposer or focus on responder. This combination creates four quadrants. Hilbig et al. (2009) use the approach where proposer decides on the actual allocation of money. In our research, we use the combination: focus on the responder and his/her intention to accept the minimal value, similarly as Hilbig et al. (2013, 2015). To our best knowledge, this approach is quite rare in the literature. Table 1 illustrates the research approaches.

Table 1 Approaches to measure the score in the ultimatum game

	Actual decision	Intention of the decision
Responder´s decision	Ex-post approach. Responder was offered an endowment and now decides (accepts / rejects).	Ex-ante approach. Responders decides on the minimum limit to accept the offer (Hilbig et al. 2013, Thielmann & Hilbig, 2014).
Proposer´s decision	Decides on the actual amount of the endowment he or she allocates to responder (Hilbig et al., 2009).	Proposer estimates on the minimum limit the responder might accept.

Source: own elaboration

Economic games as dictator or ultimatum can be played in two forms: for real money e.g. Hilbig et al. (2015) or as hypothetical, where "participants are asked to imagine playing with another unknown person for money", e.g. Thielmann & Hilbig (2014).

Objective of the research study is to reveal the psychological aspects behind the decision-making of responder (recipient) in the frame of the ultimatum game. And we formulate the research question as follows:

RQ: What is the relation between the personality traits (as measured by the Hexaco-PI) and the decision in the frame of the ultimatum game from the responder´s point of view (ex-ante), using the hypothetical form of question (i.e. value-based).

2. Methodology

Research sample and procedure

The players in the sample were undergraduate students of business and management (N=224, females 62%). Sample consisted of the undergraduate students of the faculty of business and management in Czech Republic, aged between 21 – 22. The group members have similar professional interests and belong to the same socio-demographic segment what is suitable, when analyzing personality traits and related aspects, as it reduces potential sources of variability.

Participants answered the web-based questionnaires on the HEXACO Personality Inventory (PI), and the two consecutive questions on the dictator and ultimatum game. Before the questions on dictator and ultimatum we included 2 questions on money distribution, according to the theory on social values (Van Lange et al., 1997), so that the participants adapt their thinking and "tune in" to the concept of money distribution, however we those questions were not included into the analysis.

Instruments and measures

We used a 60-questions form of the Hexaco-PI (Ashton & Lee, 2009). Hexaco-PI has six wider personality traits: Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Each wider trait consists of four more specific narrow traits. A detailed description of the traits can be found at hexaco.org (Hexaco homesite, 2020). In the analysis we opted for the narrow traits with the aim to encompass personality nuances explaining the underlying psychological processes.

In the ultimatum question we asked how the participants would distribute 1000 money units, between himself/herself and another (anonymous) person; knowing that if the other person shall not agree with the distribution, both receive 0.

We use the hypothetical form of question regarding the money distribution, where the participants are asked "to imagine playing with another unknown person for money" (Thielmann & Hilbig, 2014). Furthermore, we detached the material monetary value and its meaning by using the term "money units". Aim was to eliminate

distraction caused by the real money associations (f.e. How much money I have now. What can I buy for it.), what to our opinion, helps to focus on the world of inner values of individuals.

Data analysis

As the first step, we carried out basic descriptive statistics and Mann-Whitney U test to analyze gender differences in the raw score. Due to the nature of data distribution we divided data into two groups (x >= 500), with the intention to use the binomial logit regression. Subsequently we created two types of models: structural equation model and the binomial regression model.

We employed structural-equation modelling, using the SmartPLS software (Ringle, Wende & Becker, 2015). We used latent variables correspondingly to the six HEXACO dimensions. Structural equation modelling, thanks to the computational methods, helps to solve problems as poor model fit, inflated factor correlations, and biased parameter estimates (Asparouhov & Muthén, 2009).

We add the binomial logit regression model to reveal the relation between the ultimatum game and the narrow personality traits. For the sake of good empirical understanding, we add graphical analysis (using simple linear regression).

3. Results

Analysis of the raw scores of the ultimatum game

Table 2 shows the basis parameter of the ultimatum score, for males and females. Interestingly, the modus for both genders is 500; what is also evident from the histogram (fig. 1). Relative frequency of mode is 42 % for males and 50 % for females.

Table 2 Basis statistics, values in ultimatum game

Sex	N valid	Mean	Std. dev.	Median	Mode	Freq. of modus	Freq. of modus %
Male	85	387	199	499	500	35	42
Female	139	421	142	500	500	70	50

Source: own elaboration
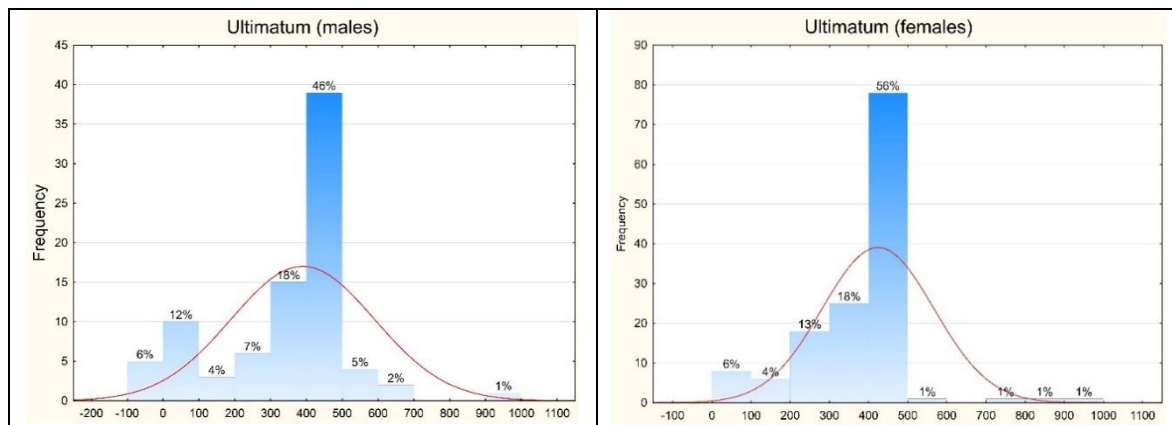
Figure 1 Histogram, values of scores in the ultimatum game, by genders
Source: own elaboration

Mann-Whitney U test, showed no statistically significant differences between genders as regards the ultimatum raw score (Z adj. = -0.79; p-value = 0.43), even if the score´s mean value for males is smaller than for females (mean value for males 387 / females 421).

Structural equation models

This chapter brings the results of the structural equation model (SEM). Latent variables were constructed in line with the logic of the Hexaco model (Thielmann & Hilbig, 2014). Input variables are narrow personality traits, grouped according to the wider traits, which represent the latent variables, output variable is the ultimatum score. Figure 2 shows the model
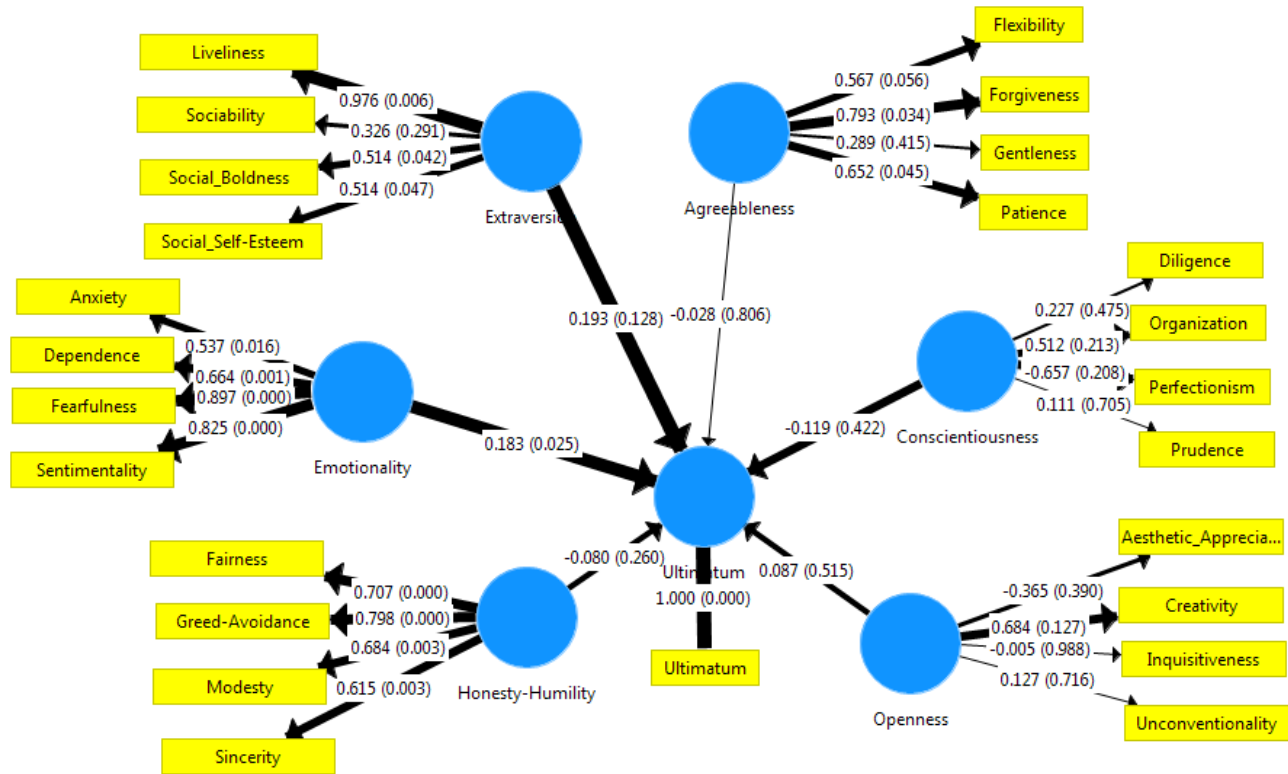
Figure 1 Structural equation model, Ultimatum vs. Hexaco personality traits. Numbers show path effects, p-values are in the brackets, width of lines illustrate absolute values of variables´ weights. (Made by the software PLS-smart)
Source: own elaboration

Table 3 presents result of the SEM model calculation (bootstrapping method). Only the single trait emotionality is statistically significant ($\beta = 0.183$; p-value = 0.025). Then the trait extraversion is relatively near the zone of acceptance ($\beta = 0.192$ p-value = 0.13). Other traits, honesty-humility, conscientiousness, openness and agreeableness are not statistically significant.

Table 3 Structural equation model, Ultimatum vs Hexaco personality traits, for both genders. Sorted by p-values

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P-values
Emotionality -> Ultimatum	0.18	0.19	0.08	2.24	0.03
Extraversion -> Ultimatum	0.19	0.17	0.13	1.52	0.13
Honesty-Humility -> Ultimatum	-0.08	-0.11	0.07	1.13	0.26
Conscientiousness -> Ultimatum	-0.12	0.00	0.15	0.80	0.42
Openness -> Ultimatum	0.09	0.02	0.13	0.65	0.52
Agreeableness -> Ultimatum	-0.03	-0.04	0.11	0.25	0.81

Source: own elaboration

Analysis by means of ultimatum game through the prism of narrow traits, by logit model

In order to understand better the results stemming from the structural equation model, we add the analysis by means of the logit model, using the narrow traits of Hexaco-PI. For the sake of the logit model construction, we split the participants into two groups, based on the ultimatum score ($x < 500$ and $x >= 500$), as shown in the table 4. Interestingly, we got the division of 51 to 49 % for males, and 47 to 53 % for females, what is suitable for the logistic regression.

Table 4 Frequency distribution, values in ultimatum divided into two categories, to be used in the binominal regression.

	Sex	Freq. total	Freq. %
x < 500	Male	43	51
x >= 500	Male	42	49
Total	Male	85	100
x < 500	Female	65	47
x >= 500	Female	74	53
Total	Female	139	100

Source: own elaboration

As regards the quality, the model has following parameters: Cox-Snell R2 = 0.15, Nagelkerke R2 = 0.20; percentage of the correct predictions is 71.6 % ($x >= 500$) and 64.8 % ($x < 500$). Note: Aim of this research is not to develop a model which would exactly predict the responder´s choice in the ultimatum game, but rather to provide an insight into the underlying psychological processes and corresponding personality traits. From this perspective, the quality of the logit model can be considered as satisfactory.

Table 5 presents the binominal regression model (all effects). In order to capture the subtle nuances of the psychological processes underlying the decision-making process, we add the analysis based on the narrow traits. Personality traits reaching the level of statistical significance (p-value < 0.05) are traits belonging under emotionality: dependence (r = - 0.40, p = 0.04) and sentimentality (r = 0.47 p = 0.05); and the narrow traits belonging under extraversion: sociability (r = - 0.46 p = 0.02) and liveliness (r = 0.56 p < 0.01).

Table 5 Logit model, ultimatum game vs. narrow traits of Hexaco-PI (all effects)

		Estimates	Std. error	Wald. (Stat.)	Odd (ratio)	p-value
	Abs.	0.13	2.10	0.00		0.95
Honesty-humility	Sincerity	0.30	0.21	2.04	1.35	0.15
	Fairness	-0.18	0.17	1.12	0.84	0.29
	Greed-Avoidance	0.11	0.21	0.28	1.12	0.60
	Modesty	-0.13	0.18	0.58	0.88	0.45
Emotionality	Fearfulness	0.31	0.24	1.66	1.36	0.20
	Anxiety	-0.04	0.17	0.06	0.96	0.81
	Dependence **	-0.40	0.20	4.06	0.67	0.04
	Sentimentality **	0.47	0.24	3.91	1.60	0.05
Extraversion	Social Self-Esteem	0.09	0.22	0.16	1.09	0.69
	Social Boldness	0.20	0.19	1.01	1.22	0.31
	Sociability **	-0.46	0.19	5.50	0.63	0.02
	Liveliness **	0.56	0.20	8.09	1.75	0.00
Agreeableness	Forgiveness	-0.28	0.20	2.00	0.76	0.16
	Gentleness	-0.35	0.24	2.11	0.70	0.15
	Flexibility	0.09	0.23	0.14	1.09	0.71
	Patience	0.13	0.18	0.49	1.14	0.48

Conscientiousness	Organization	-0.34	0.19	3.33	0.71	0.07
	Diligence	-0.23	0.23	1.04	0.79	0.31
	Perfectionism	0.22	0.22	0.92	1.24	0.34
	Prudence	-0.06	0.21	0.09	0.94	0.77
Openness	Aesthetic Appreciation	0.02	0.17	0.02	1.02	0.89
	Inquisitiveness	-0.01	0.16	0.00	0.99	0.95
	Creativity	0.19	0.18	1.14	1.21	0.29
	Unconventionality	-0.20	0.26	0.60	0.82	0.44

Source: own elaboration

Interestingly, at the level of wider traits, results from the binominal logit regression correspond to the results stemming from the structural equation modelling (table 3). Both models point out to the wider traits of extraversion and emotionality.

Figure 3 shows the graphical relation between the statistically significant personality traits and ultimatum game: liveliness, sociability (extraversion) and sentimentality, dependence (emotionality).
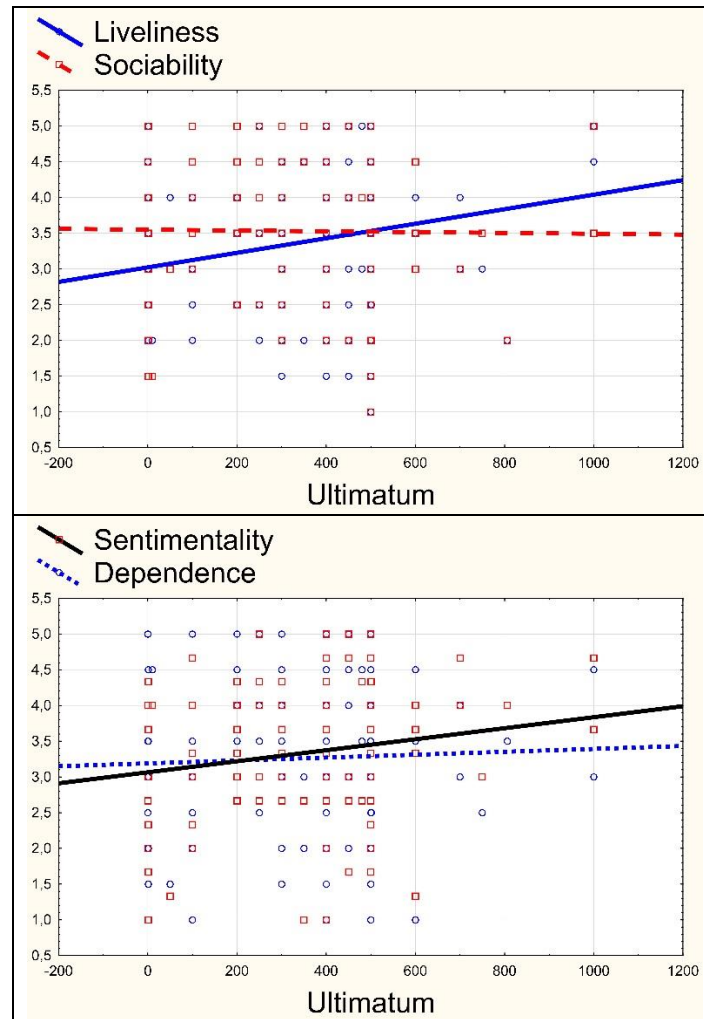
Figure 2 Relation between ultimatum game and liveliness and sociability (top) and sentimentality and dependence (bottom). Calculation by means of simple linear regression.
Source: own elaboration

4. Discussion

Analysis of the raw score of the ultimatum game
Homo economicus vs natural tendency to fairness

Mode for both genders equals 50 % of the total (table 1, figure 1), what in other words means that most of the participant expect a fair deal. This finding brings interesting implications.

Firstly, results contradict the thesis of the rational behavior as suggested by the game theory (Rubinstein, 1982), where the participant should accept any offer higher than zero. On the other hand, the fact that important part of participants would accept offers smaller than 50 % might be interpreted as a tendency towards the rationality, as defined by the game theory.

Second implication regards fairness. As there is a substantial group of people who have tendency to expect fair offers (frequency of the mode is 50 % for females and 42 % for males), in line with Binmore et al. (1985) and Thaler (1988), we can hypothesize that the fairness (or the tendency to expect fairness) is a natural behavioral tendency).

As regards the gender differences, 50 % for females and 42 % for males expect fair value, on average females excepted 421 points and males 387. However, the results of the Mann-Whitney U test show no significant differences (table 2).

Responder's expectations (decision ex-ante) vs. reaction (decision ex-post)

From the research focused on the proposers (Camerer & Thaler, 1995) we know that the most frequent proposition is between 30 and 40 and the most frequent rate of rejection is the value below 20 percent. Kahneman, Knetsch & Thaler (1986) finds that mean of the minimal offer accepted by the responders is between 20 and 26 percent. While in our research the most frequent value of rejection is 50%. We can only hypothesize, why is it so.

Perhaps, potentially, the most import reason for this difference, is the fact that we ask the responders on the value, that they would accept. In other words, we are basically asking about their expectations, where one can assume, that most responders would expect an ideal case, which is a fair deal of 50%. However, from our everyday real life experience we know, that one thing is an expectation in the ideal situation, on the one hand; on the other hand, as a matter of fact, people under the force of the circumstances might accept the deals that are less convenient than ideal. What brings us back to the thesis rationality in terms of homo economicus.

Relations between the ultimatum game and the personality traits

Results based on the structural equation model (table 4) and the binomial model (table 7) bring the same results, at the level of wider traits, notably extraversion and emotionality.

Liveliness and sentimentality

As the logit model shows, there are two variables predicting significant and positive correlation with the ultimatum game score: liveliness ($r = 0.56$ $p < 0.01$) and sentimentality ($r = 0.47$ $p = 0.05$), see table 4 and fig. 3. Liveliness is defined as a tendency to manifest optimism, joy and energy; and sentimentality denotes to tendency to feel strong emotional bonds with others.

Hence, based on the results, as regards the role of the ex-ante responder in the ultimatum game, we can intuitively agree with the idea, that highly optimistic and joyful people who create strong emotional connections with other, will expect an anonymous counter-player to propose a higher offer (or a fair offer eventually). The narrow trait sociability and sentimentality belong under the roof of wider traits emotionality and extraversion, which predict the ultimatum scores according the structural equation model (fig. 2, table 2).

We believe that higher levels of ultimatum game score (from the responders´ perspective) might be related with the notion of trustworthiness. According to Ashton, Lee & De Vries (2014, p. 150) "*the tendency to be trusting of others is associated with higher agreeableness and to some extent higher honesty-humility and higher extraversion (which relies to the tendency to feel confident and optimistic in general).* Subsequently, these personal qualities are also reflected in the traits as sentimentality and liveliness.

Sociability and Dependence

Binomial logit model (table 5, fig. 3) revealed another two variables predicting the ultimatum game score, both in negative way: dependence (r = -0.40 p = 0.04) and sociability (r = - 0.46 p = 0.02). Personality trait dependence assesses the need for emotional support from others, persons with low scores feel self-assured and solve their problem independently. Sociability is defined as a tendency to enjoy conversation, social interaction, and parties (Hexaco homesite, 2020).

As regards dependence, it is in line with empirical expectations that people who prefer to deal with their problems independently, without seeking help or emotional support will expect higher (or fair) offer in the ultimatum game. Subsequently, less emotionally self-assured people might be satisfied with lower (or less fair) offers.

As regards sociability, we do not see a straightforward theoretical or empirical explanation, why people with introverted tendencies (lower on the sociability scale) expect higher (or fairer) offers. We can only hypothesize. There are two types of hypothesis. First, there is a specific personality type with high tendency to except high score in ultimatum and this personality type ontologically integrate the trait of sociability.

The other type of hypothesis (which applies to the whole research) might work with the idea that similar people decide for different reasons, reasons other than the explicit personality traits; for example different personal values, life experiences or stages of the cognitive and moral development, etc. Consequently, there might not be clear and unambiguous patterns, in terms of the personality traits, at the level of the whole datasets, and inferential statistics thus might become inefficient.

Furthermore, as fig. 3 shows, slopes of the correlation lines (based on pair correlations) are not that steep, when compared to the slopes of the traits liveliness and sentimentality. Furthermore, in the frame of correlation analysis, both variables are statistically insignificant at level p < 0.1 (dependence r = -0.03 sociability r = -0.06).

Honesty-humility and Agreeableness

In our research, using the SEM and logit model, we did not find significant relations between the ultimatum game and agreeableness as did Hilbig et al. (2013) and Hilbig et al. (2016). On the other hand, the essence of liveliness and sentimentality, as defined by Hexaco-PI can be intuitively relied with some definitional aspect of agreeableness representing the capacity to forgive the wrongs, be lenient in judging others and willing to compromise and cooperate with others (Hexaco homesite, 2020).

We also found no relation between the ultimatum game and honesty-humility as did Hilbig & Zettler (2009), using the proposer/allocators´ perspective. We did not confirm statistically significant relation between the ultimatum game and the fairness (a component of the wider trait honesty-humility), knowing that the personality trait is a principal determinant of decision-making in the dictator game, which is principally similar.

However, table 5, presenting the logit model, indicates certain role of sincerity (a component of the honesty-humility trait), might play a certain role in the ultimatum decision-making process (r = 0.30 p = 0.15). Some other methods, especially correlational analysis or graphical methods show partial relations between ultimatum and honesty-humility and agreeableness, as the nature of the ultimatum game cannot be detached from the mental processes relied to these personality traits.

Conclusion

The objective of this research study was to reveal psychological aspects underlying the decision-making processes of the responder in the frame of the ultimatum game. We used personality questionnaire Hexaco-PI (Ashton & Lee, 2009), which is both psychometrically valid, as well as empirically very well constructed.

Our research might be considered innovative from several perspectives. Firstly, there are only few research works employing similar methodology; notably combination of the personality questionnaire Hexaco-PI and the "ex-ante" decision-making from the responder's perspective (Hilbig et al. 2013, 2016).

Interestingly, we got results which are different from the two previous researches, however still empirically acceptable. Hilbig et al. (2013, 2015) found agreeableness to be the main and only predictor of the ultimatum game score. In our research it was liveliness and emotionality, which in its essence correspond to the context of trustworthiness (and strongly relates to the notion of agreeableness). We got principally similar results from two

different models, employing different calculation methodologies: the structural equation model and the logit model, that both point at the positive influence of extraversion and emotionality on the height of the ultimatum game score.

Second innovative aspect stands from the fact, that we anchored our analysis at the level of narrow traits, unlike the previous researchers (Hilbig et al. 2013, 2015, 2016) who restrict their research to the level of wider traits. Apparently, approach based on the narrow traits provides more nuanced insights into the behavioral aspects. As we could see, some narrow traits affect the output in the mutually opposite direction, what the analysis at the level of wider traits cannot reveal. Thus, the analysis at the level of narrow trait might be more accurate.

Thirdly, we used hypothetical money (Thielmann & Hilbig, 2014) and we detached the material monetary value and symbolic meaning by using the notion of "monetary units". Thus, participants do not get distorted by the real-life monetary implications as for example a shortage of money, or vise-versa. Instead, the notion of "monetary unites" evokes the authentic inner values of responders. And as our results confirm, the participants react to the question with a reasonable and meaningful variability, revealing the underlying differences related to the personality psychology.

We can conclude that our research offers a vivid and realistic insights into the psychological processes underlying the ultimatum game. Our findings bring both, theoretical understanding and empirical implications in the field of altruistic and pro-social decision-making of individuals.

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Pavel ZIARAN works as a researcher at the Faculty of Management, University of Prešov, Slovak Republic. His research interests concern psychology in organizations, psychology of motivations and application of neurosciences in the field of marketing and management.
ORCID ID: https://orcid.org/0000-0001-8282-9012

Radovan BACIK has been working as a lecturer at the Department of Marketing and International Trade of the University of Prešov since 2009. In his research activities he is focusing on the issues of Public relations, Public relations in tourism, marketing of selected areas, strategic marketing, presentation of management and marketing, communication in management, branding and innovation and online marketing.
ORCID ID: https://orcid.org/0000-0002-5780-3838

Beata GAVUROVA (corresponding author) is an expert in finance, financial analysis and financial risk management. She focuses in her research work on issues of measurement and performance management in various sectors, process management and process optimization, strategic and performance benchmarking. Her dominant research area is the development and testing in the management and performance measurement, the evaluation of methodologies and the preparation of an application platform for innovative management and performance measurement with the support of ICT. She led several national projects, has participated in many international projects targeting the innovative applications of ICT in the private and public sector.
ORCID ID: https://orcid.org/0000-0002-0606-879X

Richard FEDORKO has been working as a lecturer at the Department of Marketing and International Trade of the University of Prešov since 2014. In his research activities he is focusing on the issues of online marketing and e-commerce, especially on the fields of online advertising, online reputation, social media, customer support, consumer behaviour and mobile marketing.
ORCID ID: https://orcid.org/0000-0003-3520-1921

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SELECTION OF THE SUPPLIER OF PRODUCTION MEANS AS A RISK ELEMENT IN FARM LOGISTICS

Krzysztof Pakuła [1*], Krystyna Pieniak-Lendzion [2], Marcin Becher [3], Beata Kuziemska [4]

[1,3,4] *Siedlce University of Natural Sciences and Humanities, Faculty of Agrobioengineering and Animal Sciences,*
14 Prusa Str., 08-110 Siedlce, Poland
[2] *Siedlce University of Natural Sciences and Humanities, Faculty of Social Sciences,*
39 Żytnia Str., 08-110 Siedlce, Poland

E-mail:[1] krzysztof.pakula@uph.edu.pl (Corresponding author)*

Abstract. The aim of the study was to analyze the structure of criteria for selection of suppliers (price of the product, product quality, availability of products, flexibility of deliveries, timeliness of deliveries, payment terms, distance from the farm, transport of the supplier, experience and position of the supplier, evaluation of the existing cooperation) of selected products for plant and animal production (mineral fertilizers, plant protection products, seed material and industrial fodder for farm animals) and their importance in the logistics of agricultural holdings in the central-eastern part of Poland. The source material for the study were the results of a survey carried out among farmers having and managing their own farms of various sizes with mixed production profile - cereal cultivation and animal husbandry (dairy and meat cattle, swine). The choice of supplier in the surveyed farms was determined mainly by the quality and price of the offered product, its availability and timeliness of deliveries, and their dynamics changed as the farm area increased. Based on the conducted research, it can be concluded that the proper selection criteria for the suppliers of production means are an important element of limiting production risk in management of a farm.

Keywords: agriculture; farm logistics system; production means; supply logistics; supplier selection criteria

1. Introduction

The market of suppliers of agricultural mean of production is an important element of agribusiness, which aims at creating conditions for harmonious flow of goods and information with the use of efficient logistics (Gebresenbet, Bosona, 2012; Wajszczuk et al., 2012). Effective logistics systems allow the rationalization of logistics processes in the company, becoming the main factor determining the company's success. The mission of supply logistics is

to provide maximum security for all material needs of the company at minimum costs of delivery. The primary objective is to obtain a competitive advantage on the market and a certain level of profitability of the conducted business activity (Ghorabaee et al., 2017; Anca, 2019; Wątróbski, 2019). The needs and requirements of customers are considered to be one of the basic driving forces in the supply chain. An efficient production supply system increases the usefulness of time and space in meeting the needs of buyers. The need is the reason why the customer takes action aimed at purchasing a product or service (Staniewska, 2012; Kara, Firat, 2018; Zhang et al., 2020). Risk management is a system of activities aimed at rational maximization of broadly understood benefits or rational minimization of losses. One of the important processes reducing this risk is therefore the proper selection of suppliers of production means, ensuring an appropriate level of production quality assurance (Baran, Żak, 2013; Urbaniak, 2014; Galińska et al., 2015; Kara, Firat, 2018; Ghorabaee et al., 2017).

2. The role of the supplier of production means in the farm supply chain - literature review

For a production company, such as farm, selecting a supplier is a strategic decision. It constitutes the basis for the achievement of production targets by securing the continuity of the production process at a given production volume and profitability. The quantity, quality and price of products offered on the consumer market depends on this decision (Pruska et al., 2011; Wajszczuk et al., 2012; Zieliński, 2013). Taking into account the specific operating conditions of farms (seasonality of production, variable production cycles), it is important to adopt criteria for the selection of suppliers appropriate to the production profile, ensuring an appropriate delivery time of the necessary production means, resulting from the current demand. The most frequent criteria in this respect are: price, quality of delivered products, supplier's location, timeliness of deliveries, order completion time, discounts, payment terms, packaging method, evaluation of previous cooperation, location, communication with the supplier, complaint handling method, delivery terms, customer service quality, innovation, supplier's flexibility, resources and product range, position and reputation in the industry, comparison with the competition (Chen, 2011; Baran, Żak, 2013; Zieliński, 2013; Molamohamadi et al., 2013; Galińska et al., 2015; Ghorabaee et al., 2017). However, many authors emphasize that the criterion of price offer is in many cases more important than the quality of the product and decides about its purchase due to the reduction of production costs and the need to be competitive on the market (Morylewski, Kuboń, 2010; Thiruchelvam, Tookey, 2011; Nowakowski, Werbińska-Wojciechowska, 2012; Wajszczuk et al. 2012; Molamohamadi et al., 2013; Banaeian et al., 2015; Owsiak et al., 2015; Szymańska et al., 2018). Szymańska et al. (2018) stated that the position of suppliers on the supply market or the well-known product brand and the attractiveness of its packaging are not criteria of little importance. Nowakowski and Werbińska-Wojciechowska (2012) report that the reason for leaving and approaching competition is poor customer service (68%), unsatisfactory product quality (14%) and high price (9%) of agricultural means products.

Transport in agriculture, both inside and outside the farm, is a key element in determining the agricultural production process, its efficient functioning and profitability. The proper flow of raw material and commodity streams in farms depends mainly on the proper farm equipment with technical means of production in the form of machines and transport devices, which are part of the logistic infrastructure in farms [Gebresenbet, Bosona, 2012**;** Liu, 2017; Sheng et al., 2018].

According to Rut and Kulińska (2011), monitoring the flow of production resources should be increased to quickly respond to crises in the supply chain related to the lack of continuity of supplying farms, especially during periods of increased demand resulting from animal breeding technology or agricultural plant technology. Szymańska et al. (2018) stated that the optimal time for providing means for field production should not exceed 7 days.

Malak-Rawlikowska and Milczarek-Andrzejewska (2016) state that price, and in particular the possibility to negotiate it, is the main criterion for selecting a supplier of means of production on the feed supply market for

animal production. According to their research, 59% of farmers negotiate feed prices, with more such events occurring in the case of their purchase directly from producers (71.7%) than from intermediaries (47.3%), and obtaining a discount results from the size of the purchase and being a loyal customer to the supplier. In the case of animal production based on feed from external sources, the temporary absence of feed may lead to irreversible consequences and to longer production cycles (Wasilewski, 2010).

Supply chain management is subject to some risk, as random events and phenomena may occur - lack of proper quantity and quality of production means due to problems with timeliness and flexibility of supplies, disrupting communication with contact, financial reasons (Hardaker et al., 2004; Theuvsen L., 2013; Gebresenbet, Bosona, 2012; Serafin, 2013; Janisz, Mikulec, 2017; Anca, 2019; Zhang et al., 2020). Because of that, farmers must have risk management skills to better anticipate problems and limit their negative consequences (Kahan, 2008). Appropriate identification and estimation of the risk level enables a proper decision-making reaction in crisis situations (Kulińska, 2012; Gaschi-Uciecha, 2014; Nyamah et al., 2017; Komarek et al. 2020).

3.   Materials and methods

The selection of the supplier of the means of production is an important element in farm management in the realities of a free and competitive food production market. Efficient production management eliminates the emergence of crisis situations as a result of the lack of appropriate means of production. The specificity of agricultural production requires the implementation of 7 R's rule (right product, right place, right price, right customer, right condition, right time, right quantity), in the management of farm which may guarantee the achievement of the production goals of agricultural holdings.

The aim of the study was to analyze the structure of criteria for selection of suppliers of selected products for plant and animal production and their importance in the logistics of agricultural holdings in the central-eastern part of Poland.

The lack of this type of research relating to the research area has made an attempt to describe this problem in the aspect of sustainable agricultural production on the soils of different quality and different farms area.

The source material was the results of a survey conducted in the group of 40 individual farm owners from the Łuków and Siedlce counties, with mixed production profile - cereal cultivation and animal husbandry (dairy and meat cattle, swine). Farms were divided into 4 groups depending on the area of used land: I - below 10 ha, II - 10.1-30 ha, III - 30.1-50 ha and IV - above 50 ha. The research was anonymous and based on a questionnaire containing 20 closed, single-choice questions. The questionnaire included metric questions (concerning socio-demographic characteristics of respondents) and questions concerning the study problem – criteria for selecting suppliers of production means (fertilizers, plant protection products, animal feed, seed) in the logistic process of production supply in a farm. The decision making process related to the selection of sources of farm supply with direct means of production was based on the assessment of 10 factors: unit price of the product, product quality, availability of products, flexibility of deliveries, timeliness of deliveries, payment terms (possible loans), distance from the farm, transport of the supplier, experience and position of the supplier, evaluation of the existing cooperation. The weight of the examined criteria was determined on a five-point scale: 1 – definitely not, 2 – rather not, 3 – neither yes nor no, 4 – rather yes, 5 – definitely yes. In addition, respondents were asked to prioritize all analyzed criteria on a 1 to 10 scale. The obtained results were processed in the Statistica 12 software.

The size of the studied farms was diversified and ranged from 5.0 to 109 ha of agricultural land. Most farms were included in the 10.1 - 30 ha area group (37.5%), and the least – with an area over 50 ha (15.0%). Farms with an area below 10 ha accounted for 27.5%, and from the area group 30.1-50 ha - 20% of the surveyed farms. All

farmers were male. Nearly half of them (48.6%) were between 36 and 55 years old with vocational (41%) and secondary (39%) education.

4. Results and discussion

In the surveyed farms, the differences in the structure of factors determining the supplier selection for mineral fertilizers, plant protection products, seed material and industrial fodder for farm animals were found, depending on the size of the farm (tab. 1).

As the farm area increased, the share of product quality, punctuality of deliveries, supplier's experience and position, flexibility of deliveries, payment terms, supplier's transport and evaluation of cooperation to date increased, whereas product prices, availability and distance from the farm decreased. The greatest dynamics of change was observed for distance from the farm (decrease by 1072%), flexibility of deliveries (increase by 483%), transport (increase by 71.7%), payment terms (increase by 66.7%), evaluation of the existing cooperation (increase by 55.6%). The choice of supplier was determined mainly by the quality and price of the offered product, its availability and punctuality of deliveries (mean 15.1% of responses). It should be emphasized that in farms with an area of < 30 ha, the price was put first (16.7-17.3% of responses), and in larger farms (> 30 ha) – the first place was taken by the quality criterion (16.5-16.9% of responses). Distance from the supplier (14% of responses) and availability of products are an important decision factor for farmers with less than 10 ha of farmland. Based on the analysis of the results obtained from all farms, it was found that agricultural producers, when choosing their suppliers for production means, put the price (4.8) and product quality (4.8), punctuality of deliveries (4.8) and their availability (4.7) on an equal footing. The price criterion is in many cases decisive for the purchase of production means, and not their quality, due to the reduction of production costs and the need to be competitive. It should be noted that in the surveyed farms with an area of up to 30 ha, the price criterion prevailed over quality (Fig. 1 and 2).

Table 1. Structure of the criteria for selecting a supplier of selected means for plant and animal production in the investigated farms

Criteria for selecting a supplier	Farm area				Mean
	< 10 ha	10-30 ha	30-50 ha	> 50 ha	
	%				
experience of the supplier	6.4	7.8	8.0	8.4	7.6
availability of products	16.9	14.2	12.7	10.9	13.7
timeliness of deliveries	14.2	15.6	16.0	16.2	15.5
price of the product	17.3	16.7	13.1	12.7	15.0
product quality	14.5	16.0	16.5	16.9	16.0
flexibility of deliveries	1.8	3.3	7.5	8.7	5.3
payment terms	6.0	6.4	7.6	10.0	7.5
transport of the supplier	5.3	8.2	8.9	9.1	7.9
distance from the farm	14.0	7.3	4.2	1.5	6.7
evaluation of the existing cooperation	3.6	4.5	5.5	5.6	4.8

Source: own study

Wajszczuk et al. (2012) report that this is often due to limited financial resources allocated to production, which is caused by its small scale. The larger the farm, the more important the quality of the production means and the timeliness of deliveries (Fig. 3 and 4), because of the need to respect the technological deadlines for their use, which affect the quantity and quality of the final product going to the consumer market. In agricultural production, the time of order completion is important - punctuality of deliveries, because farmers have only a strictly defined period of time for their application (e.g. agrotechnical terms) (Szymańska et al., 2018).
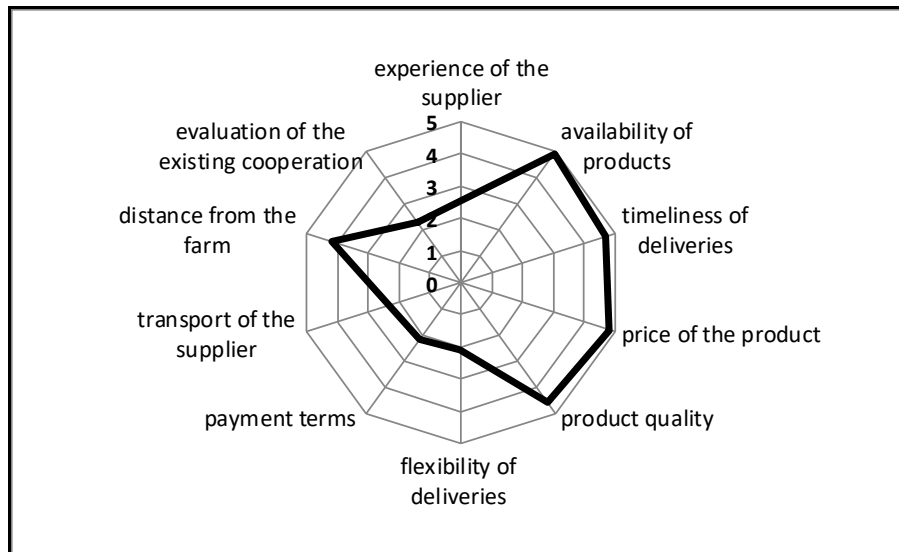
Fig. 1. Factors deciding about selection of suppliers on the investigated farms with an area below 10 ha (scale 1-5 points)
Source: own study
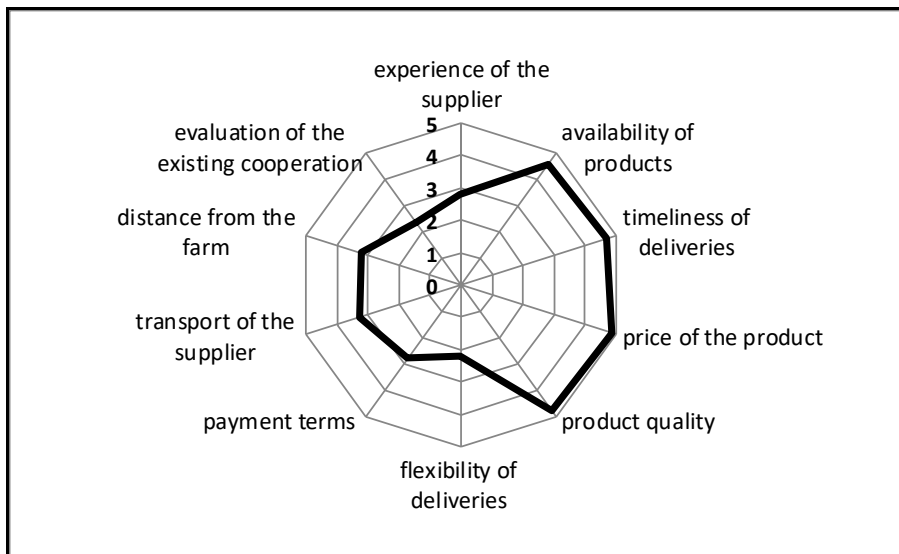
Fig. 2. Factors deciding about selection of suppliers on the investigated farms with an area in the range of 10-30 ha (scale 1-5 points)
Source: own study

The least significant factor was the evaluation of the prior cooperation (2.5), which may mean that farmers have the possibility to obtain supplies from several suppliers who are at the moment in a position to present the best

commercial offer. It should be emphasized that over 70% of respondents look for suppliers based on recommendations of other agricultural producers, including 35% - who use the Internet to search for information, 15% - who trust advertising, 15% - who leave it to chance. 80% of the surveyed farms, especially those with an area of more than 10 ha, establish cooperation with more than two suppliers of production means, taking into account their position and experience on the market (2.8 - 2.9) (Fig. 2, 3, 4). In addition, it was found that 20% of farms, especially those with an area of over 30 ha, cooperate with suppliers specializing in the marketing of a particular product.
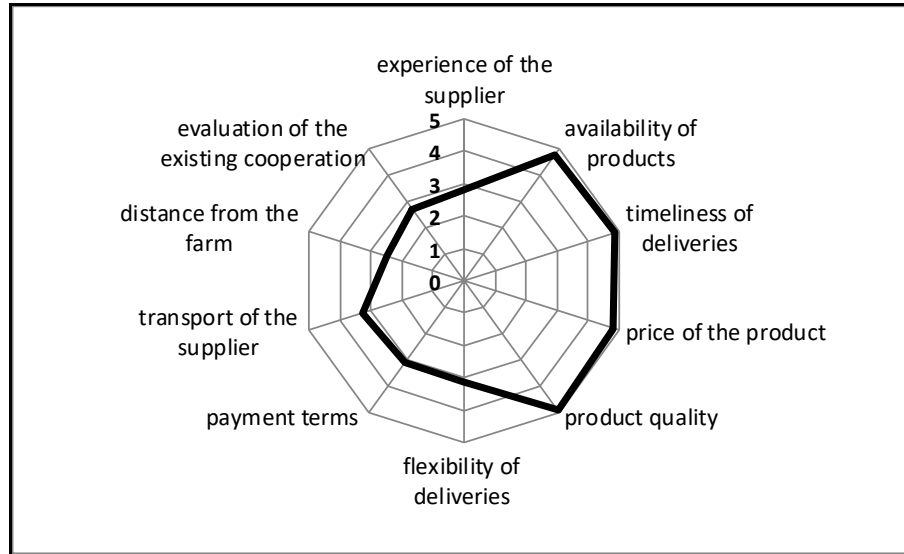
Fig. 3. Factors deciding about selection of suppliers on the investigated farms with an area in the range of 30-50 ha (scale 1-5 points)
Source: own study
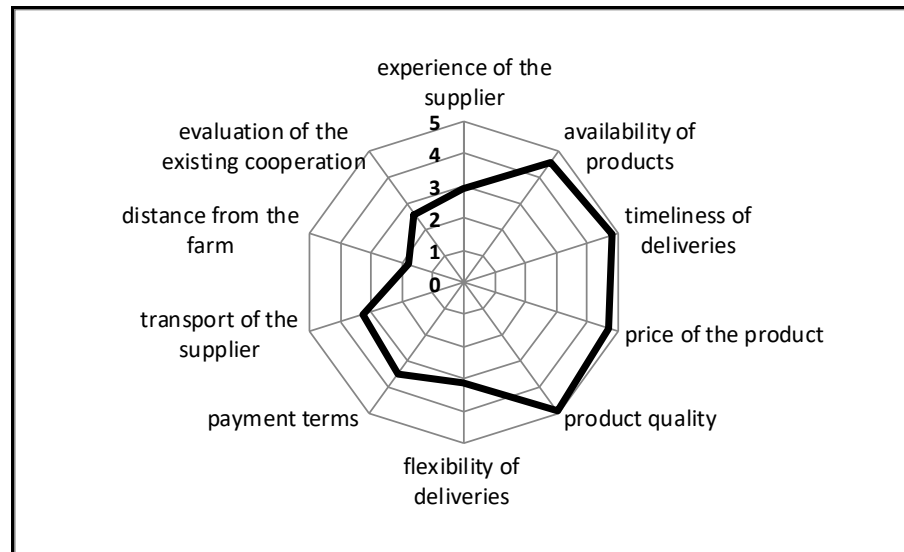
Fig. 4. Factors deciding about selection of suppliers on the investigated farms with an area above 50 ha (scale 1-5 points)
Source: own study

Diversification of the sources of supply for production with appropriate measures is an element limiting the risk to the continuity and viability of agricultural holdings. Flexibility of supplies (2.6) proved to be a minor factor in the scale of all the farms studied, especially in farms with an area of up to 30 ha (Fig. 1 and 2), where means of production are most often stored temporarily. This is also due to the widespread availability of basic fertilizers, plant protection products and seeds, as well as well-planned purchases in terms of the expected volume of production.

In small farms (< 10 ha) the distance from the supplier (4.2) turned out to be an important criterion due to the use of own means of transport to transport the purchased means of production (75% of farms), the number of which did not entitle to use the supplier's transport offer (2.3) and to negotiate payment terms (2.2) (Fig. 1). As the farm area and production volume increase, the importance of these factors increases – supplier's transport (3.3) and payment conditions (3.5), which is related to a larger amount of purchased means of production, which is best delivered in a large batch from the production logistics point of view, using means of transport of appropriate capacity offered by the supplier (85.7% of farms with an area of over 30 ha), thus reducing the weight of the distance between the supplier and the recipient (1.8), because the transport process does not require physical involvement of the farmer (Fig. 2, 3, 4) and affects the reduction of his costs (Gebresenbet, Bosona, 2012; Banaeian et al., 2015).

Conclusions

Farms purchase certain mean of production within the time limits and quantities resulting from their business profile. Efficient logistics is an important element of their functioning in the realities of the market economy. Customers expect efficient logistics services from suppliers in terms of order cycle length, delivery volume and frequency, product availability and order fulfillment performance. The choice of supplier in the surveyed farms was determined mainly by the quality and price of the offered product, its availability and timeliness of deliveries, and their dynamics changed as the farm area increased. The evaluation of the existing cooperation, flexibility of deliveries and the experience and position of the supplier on the market of agricultural co-production means turned out to be a minor factor. An important factor for the surveyed agricultural producers, not exceeded by their farms, was the distance from the supplier (farms with area < 10 ha) and the possibility to negotiate payment terms (farms with area > 30 ha), which results mainly from the scale of production and the degree of commitment of the possessed resources. Disruptions in the supply of production means can negatively affect the volume and quality of farm production. Based on the conducted research, it can be concluded that the proper selection criteria for the suppliers of production means are an important element of limiting production risk in logistic management of a farm.

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Krzysztof PAKUŁA (dr hab. inż), Assoc. Professor at Siedlce University of Natural Sciences and Humanities, Faculty of Agrobioengineering and Animal Sciences, Research interests**:** soil science; production of food; quality of the environment; sustainability; supply chain management.
ORCID ID: orcid.org/0000-0002-6568-0639

Krystyna PIENIAK-LENDZION (prof. dr hab.), Full Professor at Siedlce University of Natural Sciences and Humanities, Faculty of Social Science, Research interests**:** regional development; sustainability; supply chain management, waste management.
ORCID ID: orcid.org/0000-0002-7309-4074

Marcin BECHER (dr hab. inż), Assoc. Professor at Siedlce University of Natural Sciences and Humanities, Faculty of Agrobioengineering and Animal Sciences, Research interests**:** soil science; management of organic matter; production of food; sustainability; supply chain management.
ORCID ID: orcid.org/0000-0003-4996-1200

Beata KUZIEMSKA (dr hab.), Assoc. Professor at Siedlce University of Natural Sciences and Humanities, Faculty of Agrobioengineering and Animal Sciences. Research interests**:** waste management; environment pollution; sustainability; supply chain management; production of food, **ORCID ID**: orcid.org/0000-0002-1619-0799

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CORPORATE GOVERNANCE AND THE PERFORMANCE OF NON-FINANCIAL FIRMS: THE CASE OF OMAN

Hana Bawazir [1], Anis Khayati [2], Fatema AbdulMajeed [3]

[1,2] University of Bahrain, College of Business Administration, Zallaq, Bahrain
[3]Ministry of Interior, Manama, Bahrain

E-mails:[1] hbawazir@uob.edu.bh; [2]aelkhayati@uob.edu.bh; [3]fa.ghaibullah@interior.gov.bh

Abstract. Last two decades, corporate accounting scandals have represented a serious challenge to economic sustainability. To protect the shareholders right against abusive managerial conduct, the concepts of corporate governance structures and provisions have widely attracted the attention of practitioners and researchers. The main purpose of this paper is to examine the linkage between corporate governance and the performance of non-financial firms listed on Muscat Securities Market over the period 2007-2017. Additionally, whether financial leverage acts as a mediating factor is investigated. A panel fixed effect regression is conducted to test if there is a relationship between corporate governance, capital structure and firm performance. Overall results show that women on board, audit committee size, leverage and firm size are positively related to firm performance. The study presents a strong understanding to senior management to be focused more on corporate governance codes and regulations, as well as to both internal and external auditors to strictly monitor the application of corporate governance regulations.

1. Introduction

Corporate governance is the set of relationships and responsibilities between people involved in companies and external stakeholders establishing rules, policies and procedures appropriated for the management, administration and business control (Badele & Fundeanu, 2014). In the early 2000s, due to corporate accounting scandals, many public and academic exhibited their interest in corporate governance provision to protect the shareholders right against the abusive managerial conduct (Madanoglu et al. 2018). The major collapse of Enron, WorldCom and HIH insurance and the collapse of the Maxwell publishing Group, BCCI and Poly Peck in the United Kingdom has raised the questions on board's ability while monitoring the management (Rashid, 2018). Thus, the global economic crisis of 2007 forced rigid public, political and regulatory scrutiny on the adoption of obligatory

corporate governance practices of worldwide companies. Corporate governance also facilitates the company to maximize the value of the firm which can be observed through the performance of the firm (Gupta & Sharma, 2014).

Meanwhile, the firm performance is seen as an indicator of achieving the company's objectives and that should be continuously improved and maintained to attract investors and to retain good affiliation with stakeholders (Badriyah et al. 2015). Firm performance might also affect the choice of capital structure (Margaritis & Psillaki, 2010), and corporate governance can be used as a tool to reduce the conflicts between agents, which may have impact on a firm's capital structure (Detthamrong et al. 2017).

The theory of corporate governance also states that the impact of leverage on agency cost can also influence the firm performance (Berger & Di Patti, 2006). The term capital structure was first used by Modigliani and Miller (1958) and it can be used "*to transfer control from managers to security holders: either to creditors in bankruptcy, or to raiders in takeovers*" (Maug, 1997, p.115).

There are few empirical researches that have studied the corporate governance and firm performance in Omani listed firms. To the best of our knowledge, taking financial leverage as a mediating factor between corporate governance and firm performance has not been previously investigated on Omani listed firms. Therefore, empirical evidence in this area is still lacking.
The following research questions are going to be framed as scientific hypotheses to be tested:
- Is there any positive impact of corporate governance on firm performance?
- Is there any positive impact of financial leverage on firm performance?
- Does Financial leverage mediate the influence of corporate governance on the performance of Omani listed non-financial firms?

This research is significant for the following two reasons. Firstly, very few studies have investigated whether corporate governance enriches firm's performance in the context of Omani listed firms. Abdallah & Ismail (2017) and Pillai & Al-Malkawi, (2018) studied the relationship between corporate governance and firm performance in GCC countries and used ROA, ROE to measure the performance of the firms. Though, these studies did not measure the overall firms' performance in terms of price-earning-ratio. Secondly, the act of financial leverage as a mediator between corporate governance and firm performance has not been addressed in the context of Omani firms. Using a panel data set for the period 2000-2010, Zeitun (2014) examined the corporate governance, capital structure and corporate performance in GCC countries. However, this study overlooked the impact of corporate governance variables such as independent directors, female directors, audit committee size, etc. Al-Matari et al. (2014) studied the effect of board of directors' characteristics and audit committee characteristics on firm performance in Oman for the limited period 2011-2012. However, this study also overlooked some variables such as female directorship. Accordingly, in the context of Omani firms, none of the empirical literature tested the role of financial leverage as a mediating variable between corporate governance and firm performance.

The main purpose of this study is to find whether corporate governance and capital structure enhance the performance of the non-financial firms in Oman. The paper is organized as follows: The introduction provides an overview of introduction to the research problem, research objectives, questions and significance of the research study. Section 2 describes the methodology, data and variables used in this study. Section 3 discusses the results and findings based on different models. Finally, section 4 concludes.

2. Empirical Analysis

2.1. Variables and Data Selection

Table 1 shows the variables used in this study. The set of data consist of information about non-financial firms listed in Muscat Securities Market. Data for ROA, ROE, and financial leverage are gathered from the firms' balance sheets and income statements. Corporate governance variables are gathered from the reports of the listed firms in Muscat Securities Market official website, and the data for share price are taken from the Thomson Reuters DataStream.

Table 1. Variables

Type	Variables	Description of Variables
Dependent Variables	Return on Assets (ROA)	ROA= Net Income/Total Assets
	Return on Equity (ROE)	ROE= Net Income/Total equity
	Price- Earning Ratio (P/E)	P/E= Share Price/Earnings per Share
Independent Variables	Board Size (BS)	The total Number of directors on the firm's board
	Board Meetings (BM)	number of annual board meetings
	Board Independence (BIND)	Board Independence is a dummy variable which take a value of one for firms employing independent directors and zero otherwise
	Female Directorship (BWOM)	BWOMEN= Female directors/total number of directors
	Audit Committee Size (AS)	the number of audit committee on the board
	Audit reputation (BIG4)	A dummy variable, which takes the value of one for the firms where firm's auditor is one of the big four auditing firms and zero otherwise. KPMG, Deloitte, PricewaterhouseCoopers and EY are big four auditing firms
	Leverage (LEV)	LEV= Total liabilities/total assets
Control Variables	Tangibility Ratio (TR)	TR= Fixed assets/total assets
	Current Ratio (CR)	CR= Current assets/current liabilities
	Firm Size (FS)	Firm size is measured as the natural logarithm of Total Assets

Source: authors

The sample of this research study covers 53 non-financial firms over the period 2007 - 2017. There were 80 non-financial firms listed as of 30th December 2017. However, 27 companies have been excluded due to non-availability of data during the study period. Financial firms are excluded as they differ in their legal requirements, structure, methods and accounting practices.

The data was collected manually. Therefore, to minimize the possible data recording errors and outliers, all variables were winsorized. The Winsorization procedure sets a limit from the rest of the sample on how far away an extreme observation is to be allowed (Cowan & Sergeant, 2001).

The sample data is analyzed using the EViews 9 software. Both random and fixed effect regressions are conducted to observe if there is a relationship between corporate governance, capital structure and firm performance. Hausman test is performed to decide whether random effect or fixed effect regressions are suitable for panel data (Wooldridge, 2012). Before running the regressions, multicollinearity is analyzed using the variance inflation factor (VIF) and residual normality tests. If the residual normality test is less than 0.05, the natural logarithm is applied. Accordingly, natural logarithm is taken for the variable P/E ratio.

2.2. Research Hypotheses and Models

Figure 1 shows the conceptual framework of this study. The conceptual framework provides a basis to recognize the impact of corporate governance and capital structure variables on firm performance and allows the development of hypotheses (Jabareen, 2009). This conceptual framework involves various dependent, independent and control variables.
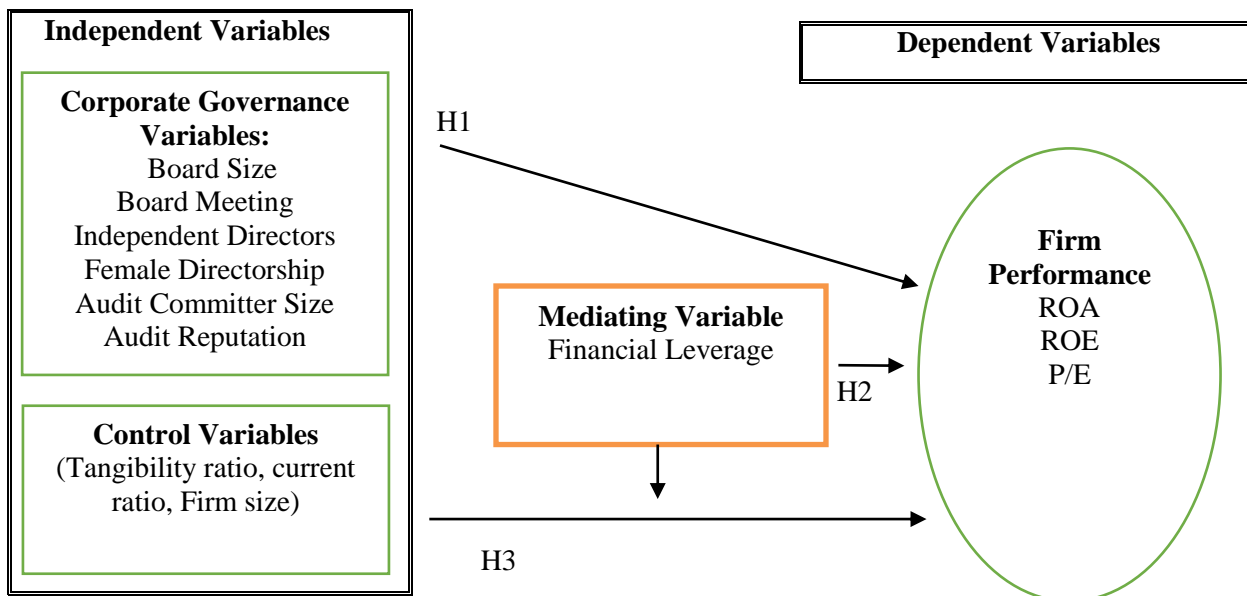
Figure 1. The conceptual framework of this study

The following hypotheses are developed based on previous literature:
H1: The impacts of corporate governance on firm performance
Hypothesis 1.1: Board size is positively associated with firm performance.
Hypothesis 1.2: Number of Board meetings is positively associated with the firm performance
Hypothesis 1.3: Board Independence is positively associated with the firm performance.
Hypothesis 1.4: Female directorship is positively associated with firm performance.
Hypothesis 1.5: Audit committee size is positively associated with firm performance.
Hypothesis 1.6: Audited reputation is positively associated with firm performance

H2: The impacts of financial leverage on firm performance
Hypothesis 2: Financial leverage is positively associated with firm performance.

H3: The mediating impacts of financial leverage on the association between corporate governance and firm performance.
Hypothesis 3.1: Financial Leverage mediates the effect of Board Size on firm performance.
Hypothesis 3.2: Financial Leverage mediates the effect of Board meeting on firm performance.
Hypothesis 3.3: Financial Leverage mediates the effect Board Independence on firm performance.
Hypothesis 3.4: Financial Leverage mediates the effect Female Directorship on firm performance.
Hypothesis 3.5: Financial Leverage mediates the effect Audit committee size on firm performance.
Hypothesis 3.6: Financial Leverage mediates the effect Audit Reputation on firm performance.

In this study, three research models are presented. The first model tests the impact of corporate governance on firm performance. The second model investigates the effect of financial leverage on firm performance and the

third model tests the impact of corporate governance and financial leverage on firm performance. Therefore, the firm performance is a dependent variable in all three models. In addition to independent variables, control variables that are important in determining the performance of the firm are also considered. The details of all three models are presented as follows.

Model 1: The impact of corporate governance on firm performance

$$Y_{it} = \beta_0 + \beta X_{it} + \gamma Z_{it} + \varepsilon_{it} \ (1)$$

Where Y_{it} is the dependent variables (ROA, ROE and P/E ratio) for firm i at t time. X is a corporate governance variable for firm i at time t, Z is control variables and ε is the error term.

$$ROA_{it} = \beta_0 + \beta_1(BSIZE)_{it} + \beta_2(BM)_{it} + \beta_3(BIND)_{it} + \beta_4(BWOMEN)_{it} + \beta_5(ASIZE)_{it}$$
$$+ \beta_6(BIG4)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$
$$ROE_{it} = \beta_0 + \beta_1(BSIZE)_{it} + \beta_2(BM)_{it} + \beta_3(BIND)_{it} + \beta_4(BWOMEN)_{it} + \beta_5(ASIZE)_{it}$$
$$+ \beta_6(BIG4)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$
$$P/E_{it} = \beta_0 + \beta_1(BSIZE)_{it} + \beta_2(BM)_{it} + \beta_3(BIND)_{it} + \beta_4(BWOMEN)_{it} + \beta_5(ASIZE)_{it}$$
$$+ \beta_6(BIG4)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$

Model 2: The impact of the financial leverage on the firm performance

$$Y_{it} = \beta_0 + \beta X_{it} + \gamma Z_{it} + \varepsilon_{it} \qquad (2)$$

Where Y_{it} is the dependent variables (ROA, ROE and P/E ratio) for firm i at t time. X is a leverage for firm i at time t, Z is control variables and ε is the error term.

$$ROA_{it} = \beta_0 + \beta_1(LEV)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$
$$ROE_{it} = \beta_0 + \beta_1(LEV)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$
$$P/E_{it} = \beta_0 + \beta_1(LEV)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$

Where ROA – return on assets; ROE- return on equity; P/E – Price-Earning-Ratio; Lev – financial leverage; TR- tangibility ratio; CR- current ratio; FSize- firm size; ε ij probable error.

Model 3: The impact of corporate governance and financial leverage on firm performance

$$Y_{it} = \beta_0 + \beta CG_{it} + \delta(LEV)_{it} + \gamma Z_{it} + \varepsilon_{it} \qquad (3)$$

Where Y_{it} is the dependent variables (ROE and P/E) for firm i at t time. CG is corporate governance variables for firm i at time and LEV is a leverage for firm i at time t. Z is control variables and ε is the error term.

$$ROE_{it} = \beta_0 + \beta_1(BSIZE)_{it} + \beta_2(BM)_{it} + \beta_3(BIND)_{it} + \beta_4(BWOMEN)_{it} + \beta_5(ASIZE)_{it}$$
$$+ \beta_6(BIG4)_{it} + \delta_1(LEV)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$
$$P/E_{it} = \beta_0 + \beta_1(BSIZE)_{it} + \beta_2(BM)_{it} + \beta_3(BIND)_{it} + \beta_4(BWOMEN)_{it} + \beta_5(ASIZE)_{it}$$
$$+ \beta_6(BIG4)_{it} + \delta_1(LEV)_{it} + \gamma_1(TR)_{it} + \gamma_2(CR)_{it} + \gamma_3(FSIZE)_{it} + \varepsilon_{it}$$

3. Results and Discussion

Table 2 provides the descriptive results of all variables.

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.	Maximum	Minimum
ROA	0.07	0.07	0.25	-0.11
ROE	0.12	0.13	0.42	-0.16
P/E	1.54	0.0009	1.55	1.5
BS	7.31	1.47	11	4
BM	5.91	1.95	15	4
BIND	1.00	0.06	1	0
BWOM	0.03	0.07	0.33	0
AS	3.46	0.68	6	2
BIG4	0.69	0.46	1	0
LEV	0.39	0.23	1.05	0.005
TR	0.47	0.27	0.99	0
CR	2.13	1.39	5.07	0.05
FS	16.88	1.34	20.50	14.53

Source: Authors' calculation

Table 2 indicates that the mean value of ROA is 0.07 or 7%. The mean ROE is 12%, while the mean value of P/E is 1.54. The mean value of Board Size is 7 with the largest BS having 11 members. Further, the mean value of board meeting is 6 with the largest board meetings held is 15. The results reveal that mean value of board independent is 1, while the female directorship is 3%. The results further revealed that mean value of audit committee size is 3 and 69% of the firms engaged auditors from the big4. The mean value results for leverage is 0.39. Finally, for the control variables, the results for mean value for tangibility ratio and current ratio are respectively 0.47 and 2.13. On average, the firm size is 17.

Table 3. Pairwise Correlation Matrix

	ROA	ROE	PE	BS	BM	BIND	BWOM	AS	BIG4	LEV	TR	CR	FS
Pearson Correlations Matrix													
ROA	1												
ROE	.839**	1											
PE	-1.000**	-.839**	1										
BS	.009	.044	-.010	1									
BM	.029	.008	-.029	.020	1								
BIND	.034	.031	-.034	.012	.027	1							
BWOM	.062	.107*	-.062	.135**	-.074	-.100*	1						
AS	.028	.019	-.028	.472**	.144**	-.046	-.083*	1					
BIG4	.078	.159**	-.077	.191**	.149**	-.039	.185**	.069	1				
LEV	-.315**	.020	.315**	-.001	-.037	-.020	.167**	-.017	.118**	1			
TR	-.218**	-.180**	.218**	.077	-.087*	.056	.044	-.117**	.074	.008	1		
CR	.344**	.097*	-.344**	-.148**	-.022	.048	-.065	-.020	-.129**	-.597**	-.315**	1	
FS	.154**	.231**	-.154**	.301**	.261**	.026	.110**	.146**	.405**	.144**	-.057	-.170**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 3 reports correlations between variables used in the study. The results show a high correlation between ROA and ROE (r = 0.839). This is expected as both variables are indicators of profitability. P/E is also significantly correlated with ROA and ROE. Thus, the variables can be used interchangeably as a proxy for the firm performance. It is evident from the correlation analysis that there is not a very significant correlation between independent and dependent variables. In effect, board size, board independence and board meeting are insignificantly correlated to all dependent variables.

However, board women and ROE are significantly correlated which suggest that more women on board would result in high shareholders returns. There is also a significant correlation between board women, financial leverage and firm size. This would indicate that firms with women on board are highly leveraged.
It is evident that big4 is significantly correlated with ROE. There is also a significant correlation between big4 and financial leverage. Employing auditors from reputable firms would increase the trustworthiness of the firms to the public and financing agents. In addition, financial leverage is also significantly correlated with ROA and P/E.

Finally, control variables (CR, TR and FS) do not reveal high correlation with corporate governance variables. The maximum correlation (0.4) is shown between big4 and firm size.
Before the regression analysis is undertaken, the data was tested. The tests include multicollinearity and residual normal distributions.

Multicollinearity is a statistical problem that arises if all or some of the independent variables are highly correlates with each other (Koop, 2006). Multicollinearity is tested using the variance inflation factor (VIF) method for all variables.

Table 4. Various Inflation Factor

Variable	VIF
Board Size	1.53
Board Meeting	1.13
Board independence	1.03
Board Women	1.13
Audit Committee Size	1.40
BIG4	1.26
Leverage	1.76
Tangibility Ratio	1.25
Current Ratio	1.94
Firm Size	1.40
Mean VIF	1.38

Table 4 presents the results of multicollinearity using VIF tests. The results conclude that there is not a serious issue of multicollinearity. In order to detect whether residuals are normally distributed, the Jarque-Bera test is conducted (Table 5).

Table 5. Jarque-Bera test results

	Obs.	P-Value	Result
H_0: Residual is normally distributed			
H_1: Residual is not normally distributed			
Standardized Residual (ROA)	583	0.129	Cannot reject that residuals are normally distributed
Standardized Residual (ROE)	583	0.154	
Standardized Residual (PE)	583	0.147	

Then, in order to choose between a random effects model and a fixed effects model, a Hausman test was used (Table 6).

Table 6. Hausman Test Results

H_0: Random effect Panel Data are preferred	
H_1: Fixed effect Panel Data are preferred	
p-value	0.0000

Note: *Significant at 5%.

The results in Table 6 show that the fixed effect regression model is suitable for the data.

Table 7. The impact of corporate governance on firm performance

Variable	ROA Coefficient	Std. Error	ROE Coefficient	Std. Error	PE Coefficient	Std. Error
C	0.63049	0.12668	1.098078	0.236803	1.53544	0.0015770
	(0.0000)***		(0.0000)***		(0.0000)***	
BS	-0.00456	0.00391	-0.003933	0.007309	0.00005730	0.0000487
	(0.2446)		(0.5907)		(0.2400)	
BM	-0.00233	0.00144	-0.005317	0.002695	0.00002890	0.0000179
	(0.1070)		(0.0491)**		(0.1074)	
BIND	0.03644	0.03717	0.052571	0.069482	-0.000455	0.0004630
	(0.3274)		(0.4496)		(0.3255)	
BWOM	0.02810	0.06112	0.238172	0.114245	-0.000355	0.0007610
	(0.6459)		(0.0376)**		(0.6407)	
AS	-0.01205	0.00583	-0.015865	0.010889	0.000151	0.0000725
	(0.0392)**		(0.1457)		(0.0377)**	
BIG4	0.01412	0.00681	0.00851	0.012736	-0.000176	0.0000848
	(0.0387)**		(0.5043)		(0.0381)**	
TR	0.02818	0.02209	0.051629	0.041289	-0.000353	0.0002750
	(0.2026)		(0.2117)		(0.1995)	
CR	0.01294	0.00267	0.00842	0.004983	-0.000161	0.0000332
	(0.0000)***		(0.0917)*		(0.0000)***	
FS	-0.03300	0.0069	-0.05735	0.012815	0.000412	0.0000853
	(0.0000)***		(0.0000)***		(0.0000)***	
F-statistic	15.42123		11.64325		15.44208	
Prob(F-statistic)	(0.0000)***		(0.0000)***		(0.0000)***	
R-squared	0.643564		0.57685		0.643874	
Adjusted R-squared	0.601832		0.52731		0.602178	

Note: *** Indicate significant at 1%, ** at 5% and * at 10 %

Table 7 presents the results of fixed effect panel regression where the dependent variables are ROA (return on assets), ROE (return on equity) and P/E (price earnings ratio). Results indicate the significant and positive impact of audit committee size (AS) on price earnings ratio, which is consistent with hypothesis 1.5. On another hand, the results show that the coefficient of AS is -0.012.5 and it statistically significant at the 5% level with ROA. The AS negative relationship with ROA suggest that an increase in the audit size will result in decrease in return on assets. This result is consistent with the study of Detthamrong et al. (2017), who also reported negative relationship between ROA and AS. Table 7 also shows negative but insignificant impact of AS on ROE. This result is consistent with Zhou et al., (2018) who reported insignificant association between AS and firm performance. The negative impact of AS on ROA and its insignificant impact on ROE suggest that Omani firms form AS only to act in accordance with the regulatory requirements rather than for other purposes.

Regarding audit reputation (Big4), the panel fixed regression results show significant and positive impact of Big4 on ROA. This result is consistent with the studies of Conheady et al. (2015), Aktan, et al., (2018) and Sial et al. (2018), who argue that audited financial reports from Big4 can help to reduce the possibility of frauds in the firms, which in turn develop investors' confidence.

The board meetings variable (BM) shows significant and negative impact on ROE. Aktan et.al. (2018) also reported negative relationship between board meeting and performance of firms listed on Bahrain Bourse for the

period 2011- 2016. The authors stated that instead of being constructive, board meetings can be destructive, since management is placed under greater autonomy and less inspection.

The variable of female directors on board shows positive and significant association with ROE. The results are consistent with previous studies that also reported positive association between women on board and firm performance. This variable can be an essential driver of board effectiveness and may influence firm performance (Liu et al., 2014; Garcia-Torea, et al., 2016; and Ahmadi et al. 2018).

The results indicate that other corporate governance variables such as board size and board independence are not associated with firm performance. A number of previous studies also showed insignificant association of board size and board independent on firm performance and suggested that corporate governance variables do not necessarily enhance performance (Zabri et al., 2016; Panditharathna & Kawshala, 2017; Eluyela et al., 2018; Yılmaz, 2018).

Finally, the control variable tangibility ratio (TR) is also not a significant variable in the determination of firm performance (ROA, ROE and PE), while the control variables current ratio (CR) and firm size (FS) are significant factors in determining the performance of the firm.

Results in Table 8 show that leverage is significant in explaining variations in firm profitability. The coefficients of leverage have a positive value of respectively 0.098815 and 0.000876. The estimated value of ROE and PE is predicated to increase when the leverage increases. The positive relationship between leverage and performance may be due to the fact that creditors monitor firms in a better way and thus lessen the investment problems. The results are consistent with a number of studies (Fosu, 2013; Handoo & Sharma, 2014; Pillai & Al-Malkawi, 2018; Ramli et al., 2019).

Table 8. The impacts of financial leverage on firm performance

Variable		ROA Coefficient	Std. Error	ROE Coefficient	Std. Error	PE Coefficient	Std. Error
C		0.611116	0.114622	0.99835	0.21503	1.535687	0.001427
		(0.0000)***		(0.0000)***		(0.0000)***	
LEV		-0.070693	0.020576	0.098815	0.0386	0.000876	0.000256
		(0.0006)***		(0.0107)**		(0.0007)***	
TR		0.024602	0.021706	0.072438	0.04072	-0.000309	0.00027
		(0.2576)		(0.0758)*		(0.2532)	
CR		0.007849	0.002996	0.016156	0.00562	-9.80E-05	0.0000373
		(0.0091)**		(0.0042)**		(0.0089)**	
FS		-0.03195	0.006601	-0.058254	0.01238	0.000399	0.00008220
		(0.0000)***		(0.0000)***		(0.0000)***	
F-statistic		16.8502		12.5555		16.8615	
Prob(F-statistic)		(0.0000)***		(0.0000)***		(0.0000)***	
R-squared		0.6421		0.5720		0.6422	
Adjusted R-squared		0.6040		0.5265		0.6041	

Note: *** Indicate significant at 1%, ** at 5% and * at 10 %

On other hand, the negative coefficient value of leverage -0.07069 indicates negative relationship with ROA. Thus, the estimated value of ROA is predicted to decrease when the leverage increases. Previous studies also reported negative relationship between leverage and firm performance (Salim & Yadav, 2012; Vătavu, 2015; Singh, 2016). The negative association between ROA and leverage is also recorded by Al Ani & Al Amri, (2015) in a study conducted on Omani industrial firms listed on Muscat securities Market over the period 2008-2012.

To test whether financial leverage mediates the impact of financial leverage on firm performance, the results of panel regression analysis are presented in Table 9. Since ROA and ROE are highly correlated (r = .839), they can be used interchangeably (Detthamrong et al., 2017). Thus, ROE is used as a proxy for firm performance. The models of ROE and PE fit the data well as all regression coefficients F-test are jointly equal to zero is rejected.

Table 9. The mediating impacts of financial leverage on the association between corporate governance and firm performance.

Variable	ROE Coefficient	Std. Error	PE Coefficient	Std. Error
C	1.060161	0.236051	1.535111	0.001565
	(0.0000)***		(0.0000)***	
BS	-0.003634	0.007272	5.99E-05	0.00004820
	(0.6175)		(0.2150)	
BM	-0.006002	0.002695	0.00002300	0.00001790
	(0.0263)**		(0.1986)	
BIND	0.049958	0.06913	-0.000478	0.000458
	(0.4702)		(0.2975)	
BWOM	0.199419	0.114676	-0.000691	0.00076
	(0.0826)*		(0.3638)	
AS	-0.015374	0.010835	0.000155	0.00007180
	(0.1565)		(0.0310)**	
BIG4	0.011055	0.012709	-0.000154	0.00008430
	(0.3848)		(0.0678)*	
LEV	0.098969	0.039012	0.000858	0.000259
	(0.0115)**		(0.0010)***	
TR	0.063121	0.041324	-0.000254	0.000274
	(0.1273)		(0.3552)	
CR	0.01555	0.005698	-9.94E-05	0.0000378
	(0.0066)**		(0.0088)**	
FS	-0.058493	0.012756	0.000402	0.0000846
F-statistic	11.67878		15.6621	
Prob(F-statistic)	(0.0000)***		(0.0000)***	
R-squared	0.582022		0.65125	
Adjusted R-squared	0.532186		0.60967	

Note: *** Indicate significant at 1%, ** at 5% and * at 10 %

Table 9 shows that there is a significant impact of BM, BWOM, AS and BIG4 on firm performance. On the other hand, BS and BIND are insignificant in determining variations in firm performance. The same results are reported in table 7, which indicates that financial leverage does not mediate the impact of corporate governance on the performance of firms.

Therefore, the results reject hypothesis 3 and indicate that in the context of Omani firms, the impact of corporate governance on firm performance is not mediated by financial leverage.

4. Conclusion

Many research studies were conducted on corporate governance and its impact on firm performance. Previous studies conducted on different areas, countries or regions revealed different results. Some studies indicated the significant positive association between corporate governance and firm performance, while others showed insignificant or negative association.

The main objective of this research is to explain the relationship between corporate governance, capital structure and firm performance on the listed non-financial firms in Oman. The findings show that female directorship, audit committee size, leverage and firm size variables are positively related to firm performance (ROE and PE). On the other hand, audit committee size and leverage are negatively related to ROA. Whereas audit reputation is significantly and positively related to ROA, tangibility ratio does not have a significant impact on ROA, ROE and PE of firms in Oman. Finally, the findings indicate that financial leverage does not mediate the effect of corporate governance on Omani firms' performance. Some of these results may seem divergent to corporate governance concepts and the efforts of the capital market authority.

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Hana BAWAZIR, Head of Economics and Finance Department at the University of Bahrain and a Chairwoman of the Cultural Committee of Bahrain Economist Society. Prior to her appointment at UOB, Hana worked as an economist in the Middle East and Central Asia Division at the IMF in Washington DC. Earlier in her career, she also worked as a visiting scholar and lecturer at Southampton University. Her research interest focuses on the empirical modelling of bank behaviour. In particular, she primarily investigates the role of the government in banking systems in terms of regulation, supervision, and bank bailouts, and how such government interventions affect bank conduct. Currently she is working on the impact of financial innovation and the role of financial inclusion on the national economy by reducing government expenditures and enhancing economic growth. Dr. Bawazir holds a PhD in Banking and Finance and an MSc in Int'l Banking and Financial Studies from Southampton University, UK. Bachelor's degree in Banking and Finance from University of Bahrain.
ORCID ID: orcid.org/ 0000-0002-7158-3771

Anis KHAYATI received his Ph.D. in Economics from Nagoya City University, Japan. He has been a faculty member at different universities in the Middle East, where he taught many courses in economics and finance. He is currently an Assistant Professor in Economics at the College of Business Administration, University of Bahrain. His main research interests are in the areas of FDI, multinational firms, economic growth, technology transfer, investment decisions, educational economics and monetary economics. He published many articles in regional and international journals.
ORCID ID: orcid.org/ 0000-0002-5520-7354

Fatema ABDULMAJEED holds a degree of BSc in Banking & Finance, 2012 from University of Bahrain, Kingdom of Bahrain. In 2020, she obtained her MBA Degree in Banking & Finance from the same university in the Kingdom. She worked as an Accountant in private sector for a while. She has currently been working as a Purchasing Specialist in the Ministry of Interior of Bahrain.
ORCID ID: orcid.org/ 0000-0002-3408-0753

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SUSTAINABLE LEADERSHIP AND SUSTAINABLE PERFORMANCE OF HOSPITALITY FIRMS IN SOUTH AFRICA

Olawale Fatoki

Department of Business Management, University of Limpopo, Private Bag X1314, Sovenga, 0727, South Africa

Email: olawale.fatoki@ul.ac.za

Abstract. Sustainable leaders use the resources of their organisations to solve environmental and social challenges while generating value for the shareholders. This study investigated the relationship between sustainable leadership and sustainable performance of hospitality firms. Financial, social, and environmental indicators were used to measure sustainable performance. The study used the quantitative research method and the cross-sectional survey method was used to collect data from 192 respondents. Descriptive statistics, Pearson correlation, and regression analysis were used for data analysis. The results indicated significant positive relationships between sustainable leadership and financial, social, and environmental performance of hospitality firms. Recommendations to improve sustainable leadership in hospitality firms include a training and a reward system that focuses on sustainable leadership and performance. Limitations and areas for further study are discussed.

Keywords: Sustainable leadership; sustainable performance; hospitality; tourism; South Africa

1. Introduction

Virakul and Russ-Eft (2019) point out that in the last three decades, many countries worldwide have been positively impacted by the effects of globalisation, capitalism, and consumerism. However, these factors have also created challenges such as climate change, depletion of natural resources, pollution, weak energy supplies, financial disruptions, and geopolitical conflicts. According to the Global Risk Perceptions 2021 report, the highest likelihood risks in the next ten years include extreme weather, human-led environmental damage, unemployment and livelihood crisis, youth disillusionment, and erosion of social cohesion (World Economic Forum, 2021). Jacobs and Mazzucato (2016) argue for the rethinking of capitalism because the current economic system has led to three fundamental and interconnected problems. These are stagnant economic growth in many countries, increasing inequality and declining standards of living and environmental challenges. The increasing levels of

social and environmental issues have triggered international and local policies aimed at promoting inclusive and sustainable growth (Mensah, 2019). In 2015, the United Nations set out 17 goals aimed at achieving a better and more sustainable future. Based on the principle of "leaving no one behind", the goals emphasise a holistic approach to achieving sustainable development for all people and countries (United Nations, 2015). Africa's Agenda 2063 aims to create and sustain a high standard of living and quality of life for all Africans and create environmentally sustainable economies and communities (African Union, 2015). South Africa's National Development Plan 2030 aims to eliminate poverty and reduce inequality and create an environmentally sustainable economy (South African Government, 2013).

Businesses have a major role in promoting sustainable development and modern enterprises are moving from an approach that focuses on promoting short-term value for shareholders to a long-term sustainable value orientation that accepts that the economy, business, society and environment are interconnected. Many businesses have incorporated sustainability policies, principles, and practices into their operation and reporting (Stavropoulou, 2015; Burawat, 2018). Tideman et al. (2013) argue that sustainable business is the only business of business. One of the ways to achieve sustainable development is for business organisations to accept the challenges of sustainability as an opportunity and transform their business models accordingly. Sustainability is a new business trend that has fundamentally changed the demands placed on business leaders and has created a new type of leadership termed sustainable leadership (Virakul, 2015; Igbal et al., 2020).

A sustainable leadership (SL) strategy depends on an organisation that is flexible and adaptive to change with the goal of creating value for shareholders and society and is a holistic approach to business management (McCann and Holt, 2010; Zulkiffli and Latiffi 2016). SL considers the connection among business, society, and environment, and value is created on the basis of long-term strategic decision-making (Iqbal et al., 2020). Sustainable leaders use the resources of the organisation to solve environmental and social challenges while generating value for the shareholders. Profit is derived from shared value, which is the result of an intentional collaboration with stakeholders (Tideman et al., 2013; Suriyankietkaew and Avery, 2016, Armani et al., 2020). In addition, there is a shift in the way that the performance of business organisations is measured from the traditional financial measure to a sustainable measure that includes social and environmental indicators. The effective integration of financial, social, and environmental measures gives a more complete measure of business performance (Elkington, 1998; Hourneaux et al., 2018; Iqbal et al., 2020).

This study aims to investigate the relationship between sustainable leadership (SL) and sustainable performance (SP) of hospitality firms. The study will be significant in the following ways. First, empirical studies on the relationship between SL and firm performance are generally lacking (Suriyankietkaew and Avery, 2016; Burawat, 2019; Iqbal et al., 2020). Lee (2017) remarks that although researchers have done a good job in explaining the significance of SL, empirical support is not as robust as theoretical arguments. SL studies are still at the stage of infancy and there is a need to extend the literature in this field (Burawat, 2019). Second, most studies linking sustainable leadership with performance have been conducted on large firms and have tended to focus on financial performance (Suriyankietkaew and Avery, 2016). Third, sustainability is currently a very important topic in the tourism and hospitality industry, and guests are increasingly using sustainability practices to choose where they stay. Sustainable leadership is needed to introduce and manage sustainable practices in the hospitality industry for sustained competitive advantage and enhanced performance. The findings of this study will be useful to hospitality firms in understanding how sustainability leadership can affect not only financial, but also their social and environmental performance. The study is structured as follows. Section two will review the literature and develop hypotheses. Sections three, four, five, and six will focus on the research methodology, results, discussion, and conclusion, respectively.

2. Literature Review

2.1 Sustainable leadership (SL)

Sustainable development has materialised as one of the challenging issues worldwide and different stakeholders such as customers and governments are putting pressure on business organisations to perform sustainably. Sustainability requires leaders who are able to combine financial with social and environmental performance (Iqbal et al., 2020). Just like leadership, there is no single universally acceptable definition of SL. Table 1 presents some of the Definition of SL.

Table 1. Definition of SL

Author and year	Definition of SL
Ferdig (2007, p32)	"Sustainable leaders take conscious actions, individually or collectively leading to outcomes that nurture, support, and sustain economic, environmental and social systems"
McCann and Holt (2011, p. 209)	"Sustainable leadership is concerned with creating current and future profits for an organization while improving the lives of all concerned"
Russell Reynolds Associates (2015, p3)	"Sustainable leaders look beyond immediate, short-term gains to see the role their organization plays in a larger context. They set strategies and ensure the delivery of results that meet the triple bottom line of social, environmental, and financial performance"
Sustainability Leadership Institute (2011)	""individuals who are compelled to make a difference by deepening their. awareness of themselves in relation to the world around them
Avery and Bergsteiner (2011, p. 6)	"the objective of sustainable leadership is to keep people, profits, and the planet in balance over the life of the firm
Visser and Courtice (2011, p. 3)	""A sustainability leader is someone who inspires and supports action towards a better world."
Bendell and Little (2015, p. 16)	"Sustainability leadership is any ethical behaviour that has the intention and effect of helping groups of people achieve environmental or social outcomes that we assess as significant and that they would not have otherwise achieve"
Pastore (2020, p. 27)	"The Sustainable Leader is a person capable of identifying, inspiring and implementing strategies, policies, Managerial behaviour consistent with the principles and purposes of sustainability"

Source: various authors

Tideman et al. (2013) point out, three new mindsets and three new skill sets are needed to be a sustainable leader. This is termed the 6C of SL model. These include (1) context: which involves the recognition of interdependence, complexity and interconnectedness, (2) consciousness: this involves worldviews and a new mindset (3) continuity: this is a long-term horizon (4) connectedness: this involves serving the needs of all stakeholders (5) creativity: this includes using innovation to create sustainable share valued and (6) collectiveness: this includes collective impact and putting sustainability in the structure of the business. A sustainable leader is expected to have six competencies. These are influencing, collaborating, commercial awareness, delivering results, the anticipation of long term trends and the evaluation of long-term trends (Tideman et al., 2013). According to Slankis (2006), the ten pillars of SL include change orientation, broad system thinking, environmental and social consciousness, business savvy that links sustainability to stakeholder values, adaptability and change, patience, transnational skills, persuasiveness through communication and relationship building, energy and passion and mentoring and development.

SL is essential to a modern day business and there is a movement away from corporate greed to a sustainable business model (Francoeur et al., 2017). Business organisations need sustainable leaders because the world's complex transnational issues such as climate change, social disruption, and pressure on natural and food resources cannot be solved by political institutions alone. Sustainable leaders are needed to balance short-term and long-term priorities and to create value for a diverse group of stakeholders (Russell Reynolds Associates, 2015). SL

can enable an organisation to achieve and sustain competitive advantage through innovation and operation of the business in an ethical manner (Slankis, 2006). The theoretical foundation of sustainable leadership can be linked to the Stakeholder theory, the Resource-based view of the firm and the Shared Value concept. The Stakeholder theory (Freeman, 1984), supports an interconnected relationship between a business and its investors, employees, customers, communities, and others that have a stake in the organisation. Therefore, value should be created by an organisation not only for shareholders but for all stakeholders. A sustainable leader is an individual who is able to create profit for his/her stakeholders, while improving the community and protecting the environment (Schwalb, 2011). The RBV (Barney, 1991) explains the link between resources, capabilities, and sustainable competitive advantage. The RBV focuses on how a firm uses resources and capabilities to reach a position of sustained competitive advantage and a higher level of performance. According to the RBV, a firm is a collection of distinctive resources and capabilities that must be optimally employed by management. The RBV argues that firms are heterogeneous in terms of capabilities, competencies, and resources, and their long-term success depends on how they efficiently and effectively utilise these capabilities in the dynamic marketplace. In addition, for a resource to contribute to sustainable competitive advantage, it must be rare, valuable, inimitable, and nonsubstitutable (Barney, 1991). Leadership is needed to effectively utilise organisational resources to achieve competitive advantage. The Shared Value concept puts emphasis on the identification of the connections between economic and societal progress. Shared values is a result of the use of the policies and practices of a firm to gain competitive advantage while improving the community in which the firm operates (Porter and Kramer, 2011). Leadership has a significant role in shared value creation and a business leader is expected to use resources to benefit the firm and the community (Chen et al., 2018).

2.2 Sustainable performance

Bouloiz (2020) points out that business organisations are currently evolving in the context of the use of natural resources and the way that they maintain relationships with employees and the community. Therefore, businesses are not just focusing on financial performance but also on social and environmental performance. While financial performance focuses on indicators such as profitability, market share, and sales, social performance focuses on stakeholders such as employees, customers, and civil society. Environmental performance focuses on environmental efficiency and the set of measurable indicators of the Environmental Management System. Slaper and Hall (2011) point out that a sustainable business creates profit for its shareholders while also improving the lives of those that it has an interaction with and protecting the environment. The Triple Bottom Line (TBL) states that for a business to be sustainable, it must be financially strong, minimise or eliminate its negative environmental impacts, and act in accordance with social expectations. (Elkington, 1998). The sustainable performance approach unites the concept of sustainability with performance and is a framework for measuring and reporting organisational results on the basis of economic, social, and environmental parameters (Hourneaux et al., 2018).

2.3 Sustainable leadership and sustainable performance

Kiron et al. (2013) and Virakul and Russ-Eft (2019) remark that some of the benefits of sustainability in business organisations include competitive advantage, enhancing corporate governance and corporate social responsibility, and better financial performance. According to Choi and Yu (2014), business sustainability practices positively affect performance through the strengthening of employees' commitment and organisational citizenship behaviour. Sustainability practices in business organisations align employees with ethical behaviour and lead to the creation of a principled ethical climate (Siletti et al., 2015). High sustainability business organisations tend to have better established processes for stakeholder engagement, longer-term orientation, tend to use both financial and nonfinancial measures, and in the long-term significantly outperform low sustainability firms in terms of accounting and stock market performance (Eccles et al., 2014).

Suriyankietkaew and Avery (2016) examine the effect of SL on the financial performance of small and medium enterprises in Thailand. The SL questionnaire by Avery and Bergsteiner (2010) was used to measure SL, while financial performance was subjectively measured by the perception of growth in sales, net profits, and cost control in the past three years. The findings based on a data set of 439 first-line and middle level managers revealed that 16 out of 23 SL practices are significantly related to firm performance.

Lee (2017) investigated the effect of five elements of SL (cohesive diversity, organisational justice, employee development, process orientation, and work/life balance) on organisational effectiveness.at micro and macro levels. The study used a large nationwide data that was collected from employees of different agencies of the United States of America federal government. The findings indicate that different elements of SL affect different aspects of organisational effectiveness to a different degree. Burawat (2019) examines the relationship between SL and SP of small and medium enterprises in the manufacturing sector in Thailand. Data was collected from 598 respondents in 374 firms. The Avery and Bergsteiner (2011) SL practices were unidimensionally used to measure SL. Financial, social, and environmental measures were used to measure sustainable performance. The results indicate a significant positive relationship between SL and SP.

Iqbal et al. (2020) examine the indirect effect of SL on SP through organisational learning. The study used a dataset collected from employees working in managerial positions of 369 SMEs in Malaysia, Indonesia, and Brunei Darussalam. The study used the 15-item scale from the study of McCann and Holt (2010) to measure SL and focuses on the perception of employees. The findings confirm the mediating effect of organisational learning in the relationship between SL and SP. Iqbal et al. (2020) in a similar study used datasets from 405 small and medium enterprises in Kuala Lumpur (Malaysia), Jakarta (Indonesia), and Bandar Seri Begawan (Brunei Darussalam). The findings indicate that SL has a positive and indirect effect on SP through psychological safety.

Al-Zawahreh et al. (2018) point out that SL creates value for all stakeholders and leads to continuous improvement and innovation and is a successful strategy for long-term success and sustained competitive advantage. In addition, organisations that adopt SL practices reap benefits in the areas of efficiency in the consumption of energy and resources, better organisational image, reduced employee turnover, better community engagement, higher productivity, and lower costs. Consequently, it is hypothesised that:

Hypothesis one: There is a significant positive relationship between SL and financial performance.

Hypothesis two: There is a significant positive relationship between SL and social performance.

Hypothesis three: There is a significant positive relationship between SL and environmental performance.

3. **Research Methodology**

The study utilised the quantitative research design. Data was collected from the respondents through the cross-sectional survey method. The survey was conducted between July 2018 and February 2019. The sample population was all hotels, lodges, and guest houses in South Africa. Before the actual survey, a pilot study was conducted with the owners/managers of thirty hotels, guesthouses, and lodges. Two academics in the area of Strategic Management also examined the questionnaire. Based on the results of the pilot study, minor adjustments were made in developing the final version of the questionnaire. The questionnaire was divided into three sections, demographic variables, SL, and SP (financial, social, and environmental). The survey was conducted in the Gauteng Province of South Africa and focused on accommodation establishments in Pretoria and Johannesburg. The Gauteng Province is the economic hub of South Africa and many hotels, guest houses, and lodges are located in the province. The participants in the survey were conveniently sampled. from some

accommodation databases such as Centurion Bed and Breakfast Association, Tshwane Accommodation listing, Johannesburg Accommodation listing, Guesthouse Association of Tshwane and the Tourism Grading Association of South Africa. The study focused on formal service accommodation (hotels and lodges) and guest accommodation (Bed and Breakfast, Country house, and Guest house) (Tourism Grading Association of South Africa, 2018). The identified respondents in the study were managers or owners because they are more likely to have the necessary information about the SL and SP of their organisations. Managers/owners of accommodation establishments were formally contacted through telephone calls and e-mails to solicit their participation. A combination of email and self-administered questionnaire methods was used to collect data from the respondents. Confidentiality and anonymity were assured and the names of the hotels and or owner/manager were not requested nor included in the questionnaire. The participants in the survey were reminded weekly to complete the questionnaire through follow-up phone calls and emails. If no response is received after two months, it was treated as a nonresponse. The questionnaire was adapted from previous studies with acceptable psychometric properties. The cover page of the questionnaire contained information about the aim of the study and that participation is voluntary. The study used descriptive statistics, Pearson correlation, and linear regression for data analysis.

Measures:
SL was measured using the 23 item SL questionnaire developed by Avery and Bergsteiner (2010). Studies on SL by Suriyankietkaew and Avery (2016) and Burawat (2019 also used the questionnaire. The five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used as the response category. The Cronbach's alpha for sustainable leadership is 0.78.

Sustainable performance: Three indicators (financial, social, and environmental) were used to measure sustainable performance (Hourneaux et al., 2018; Iqbal et al., 2020). The study utilised perceptive measures for the last three years to measure sustainable performance (Suriyankietkaew and Avery, 2016);

Financial performance (FP): Three items (increase in sales, increase in market share, and increase in profit during the last three years) and anchored on five-point Likert scale with "1 strongly disagree and 5 strongly agree" were used to measure to measure FP The items were adapted from previous studies (Suriyankietkaew and Avery, 2016; Hourneaux et al., 2018). The Cronbach's alpha for FP is 0.84.

Social performance (SP): Five items adapted from previous studies (Rashid et al., 2015; Hernandez-Perlines and Cisneros, 2017) and anchored on using five-point Likert scale with "1 strongly disagree and 5 strongly agree" were used to measure SP. The items focus on both internal and external factors and include the following items, reduced staff turnover, increased customer satisfaction with products and services, increased employee satisfaction, increased contribution to the local community for social issues, and increased employee health and safety. The Cronbach's alpha for SP is 0.79.

Environmental performance (EP): Five items adapted from previous studies (Qorri et al., 2018; Magsi et al., 2018) and anchored on the five-point Likert scale with "1 strongly disagree and 5 strongly agree" were used to measure EP. These were improvement in the efficiency of raw materials, reduction in resource consumption (energy and water), increase in recycling of materials, reduction in the cost of environmental compliance, and increased overall reputation in respects of products and services. The Cronbach's alpha for EP is 0.81.

4. Results

4.1 Response rate and biographical information

500 questionnaires were distributed to managers or owners of hospitality firms during the process of data collection. 192 questionnaires were returned and found usable. The biographical details of the respondents are as follows: education qualifications of the respondent: Matric no respondent, Matric, 45 respondents, and post-matric qualification 147 respondents. Gender of the respondent. Male 120, female 72. Age of respondents. Less than 20, no respondent,20-30 years, 7 respondents, 31-40 years, 59 respondents, 41-50 years, 73 respondents, and above 50. 53 respondents. Age of the firm, less than one year, no respondents, 1-5 years, 36 respondents, 6-10 years, 104 respondents, above ten years 52 respondents. Number of employees. No employee, no respondent, 1-5, no respondent, 6-20 employees, 33 respondents, 21-50 employees, 89 respondents, 51-200 employees, 70. The findings indicate that the majority of participating firms can be classified as small and medium enterprises (Government Gazette, 2003).

4.2 Descriptive statistics and Pearson correlation

Table 2. Descriptive statistics and Pearson correlation

Construct	Mean	SD	1	2	3	4
SL	3.15	0.88	1			
FP	3.42	0.94	0.708*	1		
SP	3.19	0.99	0.702*	0.692**	1	
EP	3.36	1.00	0.706	0.671*	0.666**	1

Source: author's data analysis

The results of the descriptive statistics and Pearson correlation are depicted in Table 2. SL has a mean score 3.15 with a standard deviation of 0.88. FP has a mean score of 3.42 with a standard deviation of 0.94. SP has a mean score of 3.19 and a standard deviation of 0.99. EP has a mean score of 3.36 and a standard deviation of 1.00. The correlation results show that SL is significantly associated with FP (r =0.708; $p<.001$), SP (r= 0.692, $p<.005$) and EP (r= 0.666, $p<.005$)

4.3 Regression results

Table 3. Regression results of SL and FP

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
Constant	107.306	2.061		2.204	.000
EP	1.046	0.482	0.692	12.008	.000
N=192, R= 0.639, R square 0 .659, Adjusted R square 0.683, Sig.< 0.05					

Source: author's data analysis

Table 4. Regression results of SL and SP

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
Constant	103.022	3.106		1.411	.001
SP	1.058	0.509	0.626	11.224	.001
N=192, R= 0.609, R square 0.620, Adjusted R square =0.648, Sig.< 0.05					

Source: author's data analysis

Table 5. Regression results of SL and EP

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
Constant	105.112	2..994		2.094	.001
EP	1.026	0.613	0.602	12.122	.001
N=192, R= 0.624, R square 0 .661, Adjusted R square 0.683, Sig.< 0.05					

Source: author's data analysis

The normal probability–probability plot was examined to measure the normality of the data. The normality of the data can be assumed because the data formed a straight line along the diagonal. In addition, a scatterplot of standardised residuals verses and standardised predicted values were created to assess homoscedasticity. The plot shows random scatter. To assess multicollinearity, variance inflation factors (VIFs). The VIF values were lower than six and this suggests that multicollinearity can be assumed. The regression results as depicted in tables 3, 4, and 5 indicate that there is a significant positive relationship between SL and FP (β 0.692, $p<0.01$), and SL and SP (β 0.626, $p<.01$) and SL and EP ((β 0.602, $p<.01$). Thus, hypotheses 1, 2, and 3 that there are significant positive relationships between SL and FP, SP, and EP are accepted. It can be concluded that SL positively impacts on the sustainable performance of hospitality firms.

5. Discussion

Businesses have a major role in promoting sustainable development and modern enterprises are moving from an approach that focuses on promoting short-term value for shareholders to a long-term sustainable value orientation that accepts that the economy, business, society and environment are interconnected. SL considers the interconnection among business, society, and environment, and value is created on the basis of long-term strategic decision-making. The study investigated the effect of SL on SP of hospitality firms. Financial, social, and environmental indicators were used to measure sustainable performance. The results indicated that SL has a significant positive relationship with FP. Hypothesis one of the study is supported. The results are consistent with the findings of Suriyankietkaew and Avery (2016) that SL is a strong predictor and driver of firm FP. The findings of the study also support a significant positive relationship between SL and SP. Hypothesis two of the study is supported. Armani et al. (2020) point out that the attributes of SL include interpersonal skills, change, orientation, alignment with organisational culture, and attention to all stakeholder. A sustainable leader should be able to continuously develop employees, maintain good labour relations, train staff, undertake succession planning, and be socially responsible by maintaining a good relationship with the community. The findings also provide empirical support for a positive relationship between SL and EP. Hypothesis three of the study is supported. According to Avery and Bergsteiner (2010), a sustainable leader must efficiently use resources such energy and water, reduce pollution, and be environmentally responsible. Al-Zawahreh et al. (2018) point out that a sustainable leader creates value for all stakeholders and undertakes a strategy for long-term sustainable performance. The results are consistent with the findings of Burawat (2019) that there is a significant positive relationship between sustainable leadership and sustainable performance. Iqbal et al. (2020) find the mediating effect of organisational learning in the relationship between SL and SP. Another study by Iqbal et al. (2020) found that that SL has a positive and indirect effect on SP through psychological safety.

6. Conclusion

This study investigated the relationship between SP and SP performance of hospitality firms. Financial, social, and environmental indicators were used to measure sustainable performance. The results indicated significant positive relationship between SL and SP. Theoretically, the study linked SL to firm financial and nonfinancial indicators. The study linked SL to sustainable performance (financial, social, and environment measures) and not just financial performance. This gives a holistic picture of how SL can impact on firm performance. Thus, the findings of the study show that a sustainable leader will not only improve firm financial performance but also social and environmental performance. A sustainable leader will be able to create value not only for shareholders but also for other stakeholders. Empirically, the study adds to the sparse studies on SL and firm performance, especially in the context of hospitality firms in a developing country. The study makes some recommendations to improve SL by hospitality firms. This includes the training of owners, managers, employees, and suppliers on SL. In addition, hospitality firms should use both financial and nonfinancial indicators to measure performance. Sustainability practices and reporting should be included in the operation and performance of hospitality firms. Leaders should develop sustainability policies and guidelines for their firms. The reward system in hospitality firms should focus on sustainable leadership and performance. The study has some limitations. First, it focused on a subjective rather than objective measures of sustainable performance. The participants in the survey are mainly small and medium-sized enterprises, and obtaining their objective results are often difficult. Second, the participants in the survey were conveniently sampled and this can lead to sampling bias. Third, only 192 owners/managers participated in the survey and care should be exercised in generalising the findings of the study. Fourth, the cross-sectional approach was adopted for the survey and this limits the ability to determine cause and effect. Other studies can use a longitudinal approach. The study focused on the owner/managers of hospitality firms. The perception of employees of hospitality firms about sustainable leadership can be determined using the 15 item sustainable leadership questionnaire by McCann and Holt (2011). The moderating effect of demographic variables (gender, age, and level of education of the owner/manager can also be investigated.

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Olawale FATOKI has a PhD in Business Management from the University of the Free State South Africa. He is currently a Professor of Business Management at the University of Limpopo, South Africa. His research interests include sustainable business, entrepreneurship and Strategic Management.
ORCHID ID: https://orcid.org/0000-0003-1539-8333

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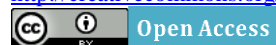
BORROWING FOR HEALTH, SUSTAINABILITY, CREDIT CARD USE AND OWNERSHIP: A STUDY OF 74 COUNTRIES

Suwastika Naidu [1], Fang Zhao [2], Atishwar Pandaram [3], Anand Chand [4], Arvind Patel [5]

[1,3,4,5]University of the South Pacific, Laucala Campus, Tagimoucia Place, Suva, Fiji Islands
[2]Staffordshire University, College Road Stoke-on-Trent Staffordshire, ST4 2DE, United Kingdom

E-mails:[1] naidu_s@usp.ac.fj; [2]fang.zhao@staffs.ac.uk; [3]pandaram_a@usp.ac.fj; [4]chand_a@usp.ac.fj; [5]patel_a@usp.ac.fj

Abstract. With the rising cost of healthcare, most households are resorting to out-of-pocket financing or borrowing to finance the high cost of health care. Intuitively, healthcare's rising cost is a global concern and is subject to a thorough economic debate. The Sustainable Development Goals (SDGs) 3 focuses on health care financing for all ages to promote everyone's healthy lifestyle. There are two objectives of this study, and these are as follows: (1) Examine the relationship between borrowing for health or medical purposes and credit card use and ownership, and (2) Explore the significant gender differences concerning borrowing for health or medical purposes. Data for this study was collected from the Global Findex Database and analyzed using the Eviews8 and Microsoft Excel software. The findings from this study confirmed that borrowing for health or medical purposes, primary education, or less (% age 15+) has a statistically significant impact on credit card ownership and usage in high-income countries. There was no relationship of this nature evident in the case of low-income countries. There are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Both Austria and Lithuania are high-income countries, but in the case of low-income countries, significant gender differences were found for Madagascar and Nepal. This study is timely and has contributed immensely to the existing literature.

Keywords: healthcare; rising cost; low-income countries; high-income countries

1. Introduction

The accessibility of quality health care services has not only become a national issue, but it has become a global concern. Numerous international discussion forums and meetings continuously emphasize the role of a responsible government in providing access to high-quality and affordable health services to its citizens (Kates et al., 2021; Behzadifar et al., 2020; Chu et al., 2019). Several studies have argued that the provision of health care services is a public good that the state cannot provide alone, and it needs private sector involvement to provide high-quality health services (Yamey et al., 2019; Chu et al., 2019). The primary aim of universal health care coverage is that everyone can access healthcare services without facing financial difficulties while paying for these services. One of the major objectives of private sector involvement in providing health care services is to achieve economies of scale and transfer these savings to consumers (Wagstaff & Neelsen, 2020; Agustina et al., 2019). In September 2015, around 193 countries worldwide agreed to the overly ambitious Sustainable Development Goal 3 (SDG 3) of providing universal healthcare coverage that is feasible and affordable to everyone. The central issue of contention is whether these countries would achieve these goals, if healthcare financing is a costly affair to all households (Rokicki et al., 2021; Fryatt & Bhuwanee, 2017). In these situations, financial innovations, such as credit cards, can act as tools for providing short-term funds for meeting household needs for healthcare expenditure (Spiegel et al., 2020; Xiao & Tao, 2020).

A close examination of the recent statistics on global healthcare spending over the last 20 years shows that the cost of global healthcare has increased over 70%, and this undoubtedly explains the rising cases of health problems reported in hospitals, and the government is spending millions of dollars to tackle these health problems. The recent statistics on government spending on health care coverage is alarming as Vietnam, Indonesia, the Philippines, and Malaysia are spending around 1.1% to 3.8% of GDP on health care (Gildea, 2019). Singapore and Thailand's spending on global healthcare coverage are much greater as it falls in the range of 4.1% to 4.9% of GDP (Gildea, 2019). As far as the global average for the OECD countries is concerned, health care coverage falls in the range of 6% to 7.7% of GDP (Gildea, 2019). In most countries worldwide, individuals and households are borrowing money to finance the rising cost of health care, as their income is not sufficient to meet the financial burden of the rising cost of health care coverage. This study specifically focuses on two crucial research questions: (1) Examine the relationship between borrowing for health or medical purposes and credit card use and ownership, and (2) Explore the significant gender differences in borrowing for health or medical purposes.

Despite the growing cost of healthcare, there are hardly any studies that have examined the relationship between borrowing for health or medical purposes and credit card use and ownership. This is a timely and significant study as it explores the individual's and household's borrowing behavior for health or medical purposes and the use of financial facilities to borrow from bank and non-bank financial institutions. Additionally, this study takes a step forward by exploring significant differences in borrowing for health or medical purposes in high and low-income countries. There are two reasons why this study is timely and significant. Firstly, this study reviews the existing literature and produces research-based evidence to extend the existing literature on the use of credit cards to meet a household's short-term need for health financing. Secondly, the research questions proposed in this study help address a national problem on the rising cost of healthcare by exploring gender differences in people's borrowing behavior in different geographical settings.

This paper is structured as follows. Section two provides the theoretical orientation, and section three reviews the existing literature. Section four outlines the research methodology, and section five presents the research findings. Section six discusses the research findings, and section seven presents the scientific knowledge and practical value. Section eight provides the conclusion, limitations, and directions for future research.

2. Theoretical Orientations

A thorough examination of the existing literature shows that several theories have been used to explain the reasons why individuals own and use credit cards (Arango et al., 2021; Santos et al., 2019; Greenacre and Akbar, 2019; Nugroho et al., 2018; Singh et al., 2018). One of the hotly debated and researched areas related to credit card ownership and use is the need for credit cardholder to have good financial knowledge and engage in responsible financial behavior when purchasing goods and services by using credit cards (Xiao et al., 2011; Zinman, 2009; Robb, 2011). This study's core issue is to examine if borrowing for health and medicine purposes influences credit card ownership and use by individuals. One of the theories that have been used in the academic literature to explain peoples buying and purchasing behavior is the Theory of Planned Behavior (Arango et al., 2021; Santos et al., 2019; Greenacre and Akbar, 2019; Nugroho et al., 2018; Singh et al., 2018). This theory is an expansion of the Theory of Reasoned Action that explains an individual's behavior at any point in time.

Drawing from the Theory of Planned Behavior and applying this theory directly to the research question proposed in this study, it can be argued that individuals borrow for several reasons and from several sources. People may borrow to meet their consumption, needs for necessity, or luxury goods and services. The first research question proposed in this study argues that borrowing for health or medical purposes is categorized as borrowing for necessity, as good health is the source of natural wellbeing and survival. The eclectic mix of studies that have applied the Theory of Planned Behavior to different research questions has helped us understand and comprehend individuals purchasing behavior in a different geographical context.

Operationally, the Theory of Planned Behavior can be used to explain why there may be significant gender differences in explaining the borrowing behaviour of gender groups in different geographical settings. De Mooij (2019) and Nunkoo & Ramkissoon (2010) argued that male and female consumption and buying behavior differ across geographical settings. Thus, this study uses the gendered Theory of Planned Behavior to explain the differences in borrowing patterns of different gender groups in unique geographical settings.

Theory of Planned Behavior: Icek Ajzen

The Theory of Planned Behavior is merely an extension of the Theory of Reasoned Action as it includes the attributes related to perceived behavioral control, which was not captured by the latter (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). The primary difference between these two theories is that the former provides a holistic picture of the consumer's behavioral intentions and their decision to engage in purchasing behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). Undoubtedly, social scientists are grateful to Icek Ajzen, who first proposed the Theory of Planned Behavior and paved the way for future researchers to apply this new theory to different fields of study, such as health care, finance, accounting, and economics, to understand consumer behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). Several theories are developed by applying the Theory of Planned Behavior to different fields of study, and some of these theories are learning, attribution, and consistency theories.

The Theory of Reasoned Action argues that an individual's attitudes and subjective norms contribute to behavioral intentions that lead to actual behavior. It is argued in this study that the socioeconomic context faced by males and females justifies the differences in the borrowing behavior noted in a different geographical context (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). For example, disadvantaged women in low-income countries may intend to borrow due to their inability to meet the high cost of health care financing, but they may not be able to borrow as borrowers need to meet the financial requirements stipulated by the bank. As Zhang et al., (2020) and Narain (2009) argues, women are less likely to have access to formal financing channels than men. Drawing from Zhang and Narain's study, this study contends that there are significant differences in borrowing for health and medical purposes in certain geographical regions.

With the introduction of perceived behavioral control as an important component used to assess an individual's behavior at any point in time, the propositions proposed by the Theory of Reasoned Action were challenged as Ajzen (1991) emphasized that the basic link between behavioral intention and actual behavior may not be present when individuals decide to exercise personal control. As an example, consumers may perceive that a credit card is one of the best facilities that they can use to borrow short-term finance for health and medical purposes, but with the recent increase in fraudulent activities involving credit cards, consumers may perceive it as a risky facility and may not use it for short-term finance. Drawing from Ajzen's work, this study argues that consumers from the disadvantaged socioeconomic background may use a credit card to mitigate unpredictable health care financing costs.

A Conceptual Model Linking Theory of Planned Behavior to Health, Gender Dimensions and Credit Card Ownership and Use: An Overview

As always, human behavior is complex, sophisticated, and difficult to understand, and out of natural curiosity, social scientists have undertaken numerous studies to understand human behavior (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Due to the unpredictable nature of human behavior, predicting current and future events has always been difficult, but social scientists have not left their relentless quest to examine, scrutinize, and predict human behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). As an example, it is complex to explain the phenomenon of why people may use a credit card to borrow for health or medical purposes in some geographical regions, but credit cards may not be a trustworthy financial instrument in other geographical regions. Additionally, it is also complex to explain the gender disparity in using a credit card as a short-term financial instrument in different countries. This paper contends that the Theory of Planned Behavior can explain credit card use and ownership as it incorporates the factors associated with perceived behavioral control in explaining the intention to own and use credit cards.

Drawing from the Theory of Planned Behavior and applying this theory to this study, it can be argued that intentions may not always lead to actual behavior due to attributes related to perceived behavioral control influencing the intention to commit to the actual behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). For instance, a credit card is a lucrative facility provided by financial institutions, and customers have a positive attitude towards the ownership and use of the credit card. One of the major advantages of owning a credit card is that it will act as a major financial backup and suffice immediate, short-term financial needs during needy times (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). However, this does not necessarily imply that customers who intend to own and use a credit card would initiate this behavior. Eventually, customers will be considering the risks associated with the ownership and use of credit cards. Financial institutions will consider the customer's financial background before deciding to approve the facility for credit card owners (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Customers will have to encounter these hurdles before initiating and completing the final purchasing behavior and using credit cards to meet short-term immediate necessity financial needs (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Figure one illustrates the two research questions proposed in this study by using the Theory of Planned Behavior.
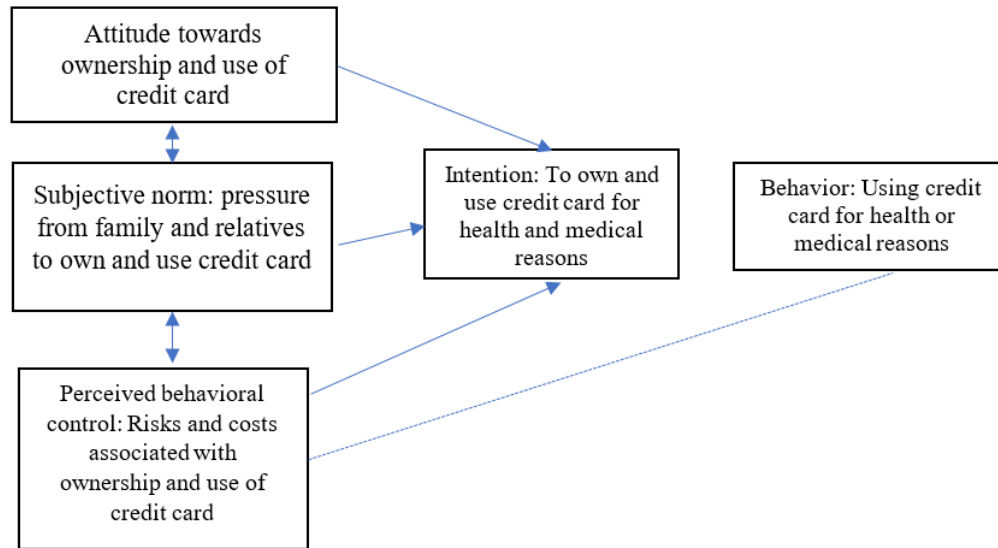
Figure 1. Integrating the Theory of Planned Behavior with Credit Card Use and Ownership
Source: Created by the authors (2019)

3. Literature Review

The household's monthly expenditure bill can be easily divided into expenditures on luxury and necessity (Getzen, 2000; Dorband et al., 2019). One of the most hotly debated topics in the extant literature is the household expenditure on necessities, as the households' ability to meet their monthly expenditure is of immense interest to academics, international stakeholders, and policymakers (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). A close examination of the existing literature shows that households spend hundreds of dollars in health care expenditure, and most of the funding for this health care expenditure is channelled through the household's income. As Wagner et al. (2011) found that in low and middle-income countries, households spend 13%-32% of their total expenditure on health care. Essentially, it is noted in this study that in low-income countries, one out four households incurred high levels of health care expenses. Flores et al. (2008) argued that inpatient care is more than 10% of household expenditure for 30% of the inpatient care patients in the case of India. Only 4% of households sacrifice 10% of their current consumption to meet inpatient care's financial demands. Studies have also confirmed that there is uncertainty involved in predicting health expenditure because it is extremely difficult for households to determine future demands for healthcare financing. As Rodríguez (2021) pointed out, individuals' future health status is uncertain; therefore, current savings are driven by the people's perception of their health status in the future. People may keep a credit card when their income is insufficient to meet their health expenditures. Several studies have argued that there is a need for more sophisticated studies to examine people's borrowing behavior for health or medical reasons and the relationship between the borrowing behavior of people and ownership of financial instruments (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019; Xiao et al., 2011; Yang et al., 2007). This study expands the existing literature by exploring two crucial research questions. The first research question explores how borrowing for health or medical reasons influences credit card use and ownership. The second research question explores the significant differences between borrowing for health or medical purposes by males and females (% age, 15 years and above).

Individuals and households may borrow due to several reasons, whereby most borrowing activities of households can be categorized as borrowing for necessity or borrowing for luxury. The intention and the household's actual borrowing behavior are determined by the availability of funds, interest rates paid on borrowed funds, and various

forms of risk associated with borrowing (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). This paper focuses on borrowing for health or medical purposes due to two reasons. Firstly, as Stuckler et al. (2011) argue, global health aid is currently being diverted towards areas of global importance, and this has resulted in the displacement of health care spending. Some of the factors that have led to the displacement of health spending are a high level of corruption and a lack of government commitment to enhance health services. This phenomenon has led to the bulging of the burden of healthcare costs faced by households and individuals. As Goulding et al. (2011) clearly emphasized in their study, due to the increase in healthcare costs, there has been an increase in the borrowing of medicines among young adults. Existing studies have identified that the number of problems has started increasing as the cost of health care coverage is becoming unmanageable for households and individuals (Yamey et al., 2019; Chu et al., 2019). This study explores how borrowing to manage the cost of health care coverage influences the ownership and use of credit cards. Secondly, this study contends that individuals' socioeconomic and demographic background may influence their borrowing behaviour for health and medical purposes. As O'Donnell and his colleagues found in their study, the population residing in rural areas is more likely to bear catastrophic healthcare expenditure, as they lack access to clean drinking water and a proper sewage system.

Several studies have argued that the sustainable approach is to improve sanitation, hygiene, and access to clean drinking water rather than saving for catastrophic health care payments in the future. Household consumption expenditure will increase as the household's catastrophic health care payment increases ((Yamey et al., 2019; Chu et al., 2019; O'Donnell et al., 2005). Similarly, Petersen et al. (2008) found that women of reproductive age are more likely to borrow medicine than women in other age groups. Cost is one of the main factors that drive the borrowing behaviour of reproductive-age women. Another study conducted by La Parra and Mateo (2008) confirmed that the British population residing in Costa Blanca had recorded better health than the Spaniards and British home population. One of the reasons attributed to this is that most British nationals residing in Costa Blanca are from either middle- or high-income groups rather than from low-income groups. Having substantial financial resources will help the British nationals living in Costa Blanca to access quality health services.

Several studies have confirmed that chronic health problems will increase the financial burden on households. Lyons and Yilmazer (2005) emphasized in their study that poor health of individuals will increase the financial hardship faced by the individuals, but it does not necessarily imply that it will lead to a decline in health status. Another study conducted by Chen et al. (2017) argued that students are faced with high levels of debt burden during their post-secondary education. This debt burden worsens when children cannot maintain a healthy lifestyle. Emanuel and Fuchs (2008) found that employers must fund worker's premiums and state funds for Children's Health Insurance program. One of the major consequences of the rising cost of healthcare, as argued by Ward et al. (2011), it is that people may borrow medicine to reduce costs, but this behaviour should be discouraged because it leads to adverse health outcomes. The rising cost of healthcare has become a growing concern, not only in developing countries but also in developed countries. Hosseini (2016) emphasized that there have been relentless efforts by government policymakers to develop sustainable and cost-effective healthcare models to reduce healthcare costs. Iran's health house health care model has been successful in providing customized healthcare in rural areas. The sustainable side of the model emphasizes reducing the healthcare cost burden faced by households. The incidence of catastrophic health care expenditure is reasonably higher, and people are struggling to meet these expenditures.

Emerging studies have emphasized several reasons why individuals may keep credit cards (Stavins, 2020). One of the reasons identified by Meier and Sprenger (2010) is that an individual's attitude towards borrowing, saving, and spending influences their decision to own and use credit cards. Meier and his colleague mentioned that present-biased individuals are more likely to engage in credit card borrowing and have high amounts of credit card debt than future biased individuals. Another reason identified by Xiao et al. (2005) is that older consumers with a secure retirement and a good family relationship are more likely to engage in positive credit card

borrowing behaviours. Babiarz et al. (2013) found an increased likelihood of an increase in debt faced by uninsured households or having an insurance scheme that provides restrictive health coverage. Noerhidajati et al. (2021), Zinman (2009) found a strong relationship between credit card borrowing and households' financial conditions. Shrivastava et al. (2019) argued that when a family faces financial hardship, this can lead to stress and adversely impact mental wellbeing. With the growing importance and use of credit cards, several studies have emphasized the need to undertake responsible financial behaviour. Xiao et al. (2011) emphasized that the Credit Card Act of 2009 promotes and fosters responsibility for young adults to gather financial knowledge before undertaking responsible financial behaviour. The findings from this study showed that socioeconomic status affects the risky credit behaviour undertaken by the students. Yang et al. (2007) found that the more likely consumers are optimistic about future borrowing behaviour, the more likely they are to own a credit card. Some of the factors that drive future borrowing behaviour are the type of employment, the volatility of income, consumption expenditure, etc. The misuse of credit cards is becoming a growing problem in the US, with college students engaging in irresponsible financial behaviour while using their credit cards. Robb (2011) explored the relationship between financial knowledge and the credit card use behaviour of college students in the US. The findings from this study confirmed that financial knowledge significantly influences the credit card decisions of college students. Himmelstein et al. (2009) study based on bankruptcy filers found that 62.1% of the US's bankruptcy filed in the year 2001 was for medical reasons. According to Yamey et al. (2019), Chu et al., (2019), and Jacoby et al. (2001), thousands of families are devastated each year due to the high cost of health care financing. Some authors have argued that health insurance can be a solution to the problem, but there are existing studies that have confirmed that filing for bankruptcy is another possible solution to this problem.

4. Research Methodology

The data for this study was collected from the Global Findex database, which is the world's biggest database on borrowing, saving, and managing risk. This database was launched by the Bill and Melinda Gates Foundation in the year 2011, and it updates its online database of financial indicators every three years. Gallup Corporation plays an essential role in the collection of data from 150,000 adults, and this data is collected for 140 economies. The Global Findex database houses data on 200 indicators, with outputs available in Stata and Excel that allow ease of download and access of data. Most of the data collected for the variables used in this study were via a Likert scale and a dichotomous scale. As per the database, data on borrowing for medical and health purposes, credit card use, and ownership was collected for the following indicators:

1. Borrowing for health or medical purposes (% age 15+)
2. Borrowing for health or medical purposes, male (% age 15+)
3. Borrowing for health or medical purposes in labor force (% age 15+)
4. Borrowing for health or medical purposes, out of labor force (% age 15+)
5. Borrowing for health or medical purposes, female (% age 15+)
6. Borrowing for health or medical purposes, young adults (% age 15-24)
7. Borrowed for health or medical purposes, older adults (% age 25+)
8. Borrowing for health or medical purposes, primary education or less (% age 15+)
9. Borrowed for health or medical purposes, secondary education or more (% age 15+)
10. Borrowing for health or medical purposes, income poorest 40% (% age 15+)
11. Borrowing for health or medical purposes, income, the richest 60% (% age 15+)
12. Borrowing for health or medical purposes, rural (% age 15+)
13. Credit card ownership (% age 15+)
14. Credit cards used in the past year (% age 15+)

Drawing from the Global Findex database, data were collected and analyzed by using the Excel software for the following developed and developing countries.

Table 1. Developed and Developing Countries

#	Developed Countries	Developing Countries
1	United Arab Emirates	Afghanistan
2	Australia	Burundi
3	Austria	Benin
4	Belgium	Burkina Faso
5	Bahrain	Central African Republic
6	Canada	Congo
7	Switzerland	Comoros
8	Chile	Ethiopia
9	Cyprus	Guinea
10	Czech Republic	Haiti
11	Germany	Liberia
12	Denmark	Madagascar
13	Spain	Mali
14	Estonia	Mozambique
15	Finland	Malawi
16	France	Niger
17	United Kingdom	Nepal
18	Greece	Rwanda
19	Hong Kong SAR China	Senegal
20	Hungary	Sierra Leone
21	Ireland	Somalia
22	Israel	South Sudan
23	Italy	Chad
24	Japan	Togo
25	Korea	Tanzania
26	Kuwait	Uganda
27	Lithuania	Zimbabwe
28	Luxembourg	
29	Latvia	
30	Malta	
31	Netherlands	
32	Norway	
33	New Zealand	
34	Oman	
35	Poland	
36	Puerto Rico	
37	Portugal	
38	Qatar	
39	Saudi Arabia	
40	Singapore	
41	Slovak Republic	
42	Slovenia	
43	Sweden	
44	Trinidad and Tobago	
45	Taiwan, China	
46	Uruguay	
47	United States	

Source: Created by the Authors

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5. Research findings

To determine the mean differences in borrowing for health and medical purposes in the context of high and low-income countries, we used the mean percentage for comparison between high income and low-income countries. The comparison of the mean percentage shows that individuals in high-income countries are less likely to borrow compared to individuals in low-income countries for health or medical purposes. In comparison to the different cohorts, the poorest 40% of the population in the high-income countries are more likely to borrow than other cohorts of the population group. On the other hand, in the case of low-income countries, individuals in the labor force above the age of 15 years are more likely to borrow compared to other cohorts (see Table two). Individuals in high-income countries are more likely to own and use the credit card compared to individuals in low-income countries.

Table 2. Summary Statistics for High-Income Countries and Low-Income Countries

High-Income Countries													
Variable Numbers													
Descriptive Statistics	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Mean	0.047	0.047	0.050	0.041	0.046	0.042	0.048	0.051	0.047	0.063	0.037	0.051	0.421	0.371
Standard Error	0.003	0.003	0.004	0.003	0.003	0.004	0.003	0.005	0.003	0.004	0.003	0.004	0.016	0.019
Median	0.040	0.040	0.040	0.035	0.040	0.030	0.040	0.040	0.040	0.055	0.030	0.040	0.420	0.360
Mode	0.020	0.020	0.040	0.050	0.010	0.000	0.020	0.030	0.030	0.040	0.020	0.040	0.170	0.200
Standard Deviation	0.031	0.032	0.037	0.027	0.031	0.039	0.032	0.045	0.032	0.041	0.028	0.036	0.186	0.182
Sample Variance	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.001	0.035	0.033
Kurtosis	0.954	1.168	1.460	-0.083	1.506	0.783	0.621	1.739	0.964	-0.212	3.127	0.819	-1.025	-0.818
Skewness	1.029	1.153	1.268	0.685	0.951	1.091	0.998	1.331	1.085	0.717	1.564	0.965	0.098	0.246
Range	0.140	0.160	0.170	0.120	0.170	0.170	0.140	0.210	0.150	0.160	0.140	0.160	0.730	0.720
Minimum	0.010	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.010	0.010	0.000	0.000	0.100	0.070
Maximum	0.150	0.160	0.170	0.120	0.170	0.170	0.150	0.210	0.160	0.170	0.140	0.160	0.830	0.790
Sum	4.110	4.170	4.280	3.560	4.070	3.720	4.220	4.480	4.150	5.510	3.230	4.410	55.590	32.680
Count	88	88	86	86	88	88	88	88	88	88	87	132	88	
Low Income Countries													
Variable Numbers													
Descriptive Statistics	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Mean	0.191	0.191	0.210	0.148	0.190	0.165	0.206	0.198	0.175	0.196	0.185	0.196	0.019	N/A
Standard Error	0.011	0.011	0.012	0.008	0.011	0.011	0.012	0.011	0.011	0.011	0.011	0.012	0.002	N/A
Median	0.180	0.180	0.200	0.150	0.180	0.150	0.200	0.180	0.170	0.180	0.180	0.180	0.010	N/A
Mode	0.100	0.090	0.170	0.170	0.260	0.110	0.110	0.100	0.160	0.130	0.160	0.180	0.010	N/A
Standard Deviation	0.072	0.074	0.081	0.055	0.075	0.074	0.079	0.077	0.077	0.076	0.075	0.078	0.018	N/A
Sample Variance	0.005	0.005	0.007	0.003	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.000	N/A
Kurtosis	-0.361	-0.724	-0.108	-0.841	0.001	0.440	-0.669	-0.573	0.076	0.215	-0.218	-0.632	3.387	N/A
Skewness	0.463	0.371	0.492	0.124	0.596	0.802	0.346	0.445	0.481	0.715	0.456	0.485	1.818	N/A
Range	0.300	0.280	0.360	0.210	0.330	0.330	0.320	0.310	0.350	0.330	0.330	0.300	0.090	N/A
Minimum	0.090	0.090	0.080	0.050	0.080	0.040	0.090	0.090	0.030	0.090	0.050	0.090	0.000	N/A
Maximum	0.390	0.370	0.440	0.260	0.410	0.370	0.410	0.400	0.380	0.420	0.380	0.390	0.090	N/A
Sum	46	46	46	46	46	46	46	46	46	45	45	46	69	N/A

Variable Code:
1 represents borrowing for health or medical purposes (% age 15+)
2 represents borrowing for health or medical purposes, male (% age 15+)
3 represents borrowing for health or medical purposes in labor force (% age 15+)
4 represents borrowing for health or medical purposes, out of labor force (% age 15+)
5 represents borrowing for health or medical purposes, female (% age 15+)
6 represents borrowing for health or medical purposes, young adults (% age 15-24)
7 represents borrowing for health or medical purposes, older adults (% age 25+)
8 represents borrowing for health or medical purposes, primary education or less (% age 15+)
9 represents borrowing for health or medical purposes, secondary education or more (% age 15+)
10 represents borrowing for health or medical purposes, income poorest 40% (% age 15+)
11 represents borrowing for health or medical purposes, income, richest 60% (% age 15+)
12 represents borrowing for health or medical purposes, rural (% age 15+)
13 represents Credit card ownership (% age 15+)
14 represents Credit card used in the past year (% age 15+)
N/A represents not applicable

Source: Created by the Authors

To determine the correlation between borrowing for health or medical purposes and credit card use and ownership, correlation coefficients were determined for each of the variables. The findings show that there is a negative correlation between borrowing for health or medical purposes and credit card use or ownership (see Table 3).

Table 3. Correlation of Borrowing for Health Purposes, Credit Card Ownership and Usage

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1.000													
2	0.986**	1.000												
3	0.994**	0.984**	1.000											
4	0.935**	0.914**	0.905**	1.000										
5	0.987**	0.950**	0.979**	0.936**	1.000									
6	0.913**	0.907**	0.908**	0.847**	0.900**	1.000								
7	0.990**	0.974**	0.987**	0.928**	0.979**	0.858**	1.000							
8	0.942**	0.931**	0.936**	0.868**	0.925**	0.838**	0.941**	1.000						
9	0.955**	0.957**	0.953**	0.893**	0.930**	0.897**	0.935**	0.874**	1.000					
10	0.967**	0.940**	0.961**	0.906**	0.965**	0.892**	0.956**	0.915**	0.902**	1.000				
1	0.984**	0.983**	0.981**	0.922**	0.964**	0.891**	0.978**	0.922**	0.953**	0.911**	1.000			
12	0.986**	0.975**	0.982**	0.919**	0.974**	0.899**	0.979**	0.939**	0.936**	0.962**	0.969**	1.000		
13	-0.699**	-0.694**	-0.701**	-0.674**	-0.692**	-0.588**	-0.708**	-0.628**	-0.661**	-0.657**	-0.699**	-0.680**	1.000	
14	-0.250*	-0.252*	-0.286**	-0.177	-0.253*	-0.014	-0.298**	-0.024	-0.253*	-0.193	-0.288**	-0.210	0.986**	1.000

Variable Code:
1 represents borrowing for health or medical purposes (% age 15+)
2 represents borrowing for health or medical purposes, male (% age 15+)
3 represents borrowing for health or medical purposes in labor force (% age 15+)
4 represents borrowing for health or medical purposes, out of labor force (% age 15+)
5 represents borrowing for health or medical purposes, female (% age 15+)
6 represents borrowing for health or medical purposes, young adults (% age 15-24)
7 represents borrowing for health or medical purposes, older adults (% age 25+)
8 represents borrowing for health or medical purposes, primary education or less (% age 15+)
9 represents borrowing for health or medical purposes, secondary education or more (% age 15+)
10 represents borrowing for health or medical purposes, income poorest 40% (% age 15+)
11 represents borrowing for health or medical purposes, income, richest 60% (% age 15+)
12 represents borrowing for health or medical purposes, rural (% age 15+)
13 represents Credit card ownership (% age 15+)
14 represents Credit card used in the past year (% age 15+)
N/A represents not applicable
Note:
**Correlation is significant at the 0.01 level (2 tailed)
* Correlation is significant at the 0.05 level (2 tailed)

Source: Created by the Authors

Table four shows that there are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Similarly, the significant difference between borrowing for health or medical reasons between males and females was found in the case of Madagascar and Nepal.

Table 4. Paired Sample t-test for Means Exploring the Significant Difference Between Borrowing for Health or Medical Purposes by Males and Females (% age, 15+)

Country	Category	T-Statistics	P(T<=t) one-tail	P(T<=t) two-tail
United Arab Emirates	High Income	3.667	0.084	0.170
Australia	High Income	-0.600	0.328	0.656
Austria	High Income	7.000	0.045*	0.090
Bahrain	High Income	2.500	0.121	0.242
Canada	High Income	1.000	0.250	0.500
Switzerland	High Income	0.000	0.500	1.000
Cyprus	High Income	1.000	0.500	1.000
Czech Republic	High Income	1.000	0.250	0.500
Denmark	High Income	-3.000	0.102	0.205
Spain	High Income	-0.333	0.398	0.795
Estonia	High Income	-1.000	0.250	0.500
Finland	High Income	1.000	0.250	0.500
France	High Income	-0.333	0.398	0.795
United Kingdom	High Income	3.000	0.102	0.205
Greece	High Income	-0.200	0.437	0.874
Hong Kong SAR, China	High Income	3.000	0.102	0.205
Hungary	High Income	-1.000	0.250	0.500
Ireland	High Income	-3.000	0.102	0.205
Israel	High Income	-1.000	0.250	0.500
Italy	High Income	-0.500	0.352	0.704
Japan	High Income	1.000	0.250	0.500
Korea, Rep.	High Income	-0.500	0.352	0.705
Lithuania	High Income	-7.000	0.045*	0.090
Luxembourg	High Income	-3.000	0.102	0.205
Latvia	High Income	-0.500	0.352	0.705
Malta	High Income	-1.000	0.250	0.500
Netherlands	High Income	1.000	0.250	0.500
New Zealand	High Income	-1.000	0.250	0.500
Poland	High Income	0.600	0.328	0.656
Portugal	High Income	0.333	0.398	0.795
Saudi Arabia	High Income	1.000	0.250	0.500
Singapore	High Income	1.000	0.250	0.500
Slovenia	High Income	-0.333	0.398	0.795
Slovak Republic	High Income	1.000	0.250	0.500
Sweden	High Income	0.333	0.398	0.795
Uruguay	High Income	-5.000	0.063	0.126
United States	High Income	1.000	0.250	0.500
Afghanistan	Low Income	2.500	0.121	0.242
Burkina Faso	Low Income	0.556	0.339	0.677
Congo	Low Income	-0.200	0.437	0.874
Chad	Low Income	0.500	0.352	0.705
Guinea	Low Income	-5.000	0.062	0.126
Haiti	Low Income	-1.500	0.187	0.374
Mali	Low Income	-6.9E-16	0.500	1.000
Madagascar	Low Income	7.000	0.045*	0.090
Malawi	Low Income	-1.667	0.172	0.344
Niger	Low Income	1.667	0.172	0.344
Nepal	Low Income	-7.000	0.045*	0.090
Rwanda	Low Income	-0.600	0.328	0.656
Senegal	Low Income	-1.4E-15	0.500	1.000
Sierra Leone	Low Income	0.667	0.313	0.626
Tanzania	Low Income	1.000	0.250	0.500
Togo	Low Income	-0.333	0.398	0.795
Uganda	Low Income	-0.333	0.398	0.795
Zimbabwe	Low Income	-3.000	0.102	0.205

Note: *p < 0.05 ** p < 0.01 ***p <0.001

Source: Created by the Authors

Table 5 presents the estimated regression parameters for predicting credit card ownership in high-income countries and low-income countries. In the case of high-income countries, borrowing for health or medical purposes, primary education or less (% age 15+) had a significant impact on credit card ownership, whereas, in the case of low-income countries, no significant results were noted.

Table 5. Estimated Regression Parameters for Predicting Credit Card Ownership in the High-Income Countries and Low-Income Countries

Variables	Model 1	Model 2
	b(SE)	b(SE)
Borrowing for health or medical purposes, male (% age 15+)	-3.50 (3.75)	-0.99(0.73)
Borrowing for health or medical purposes in labor force (% age 15+)	-3.73 (3.77)	0.51(0.42)
Borrowing for health or medical purposes, out of labor force (% age 15+)	-0.70 (2.09)	0.22(0.14)
Borrowing for health or medical purposes, female (% age 15+)	-3.63 (3.74)	-0.67(0.73)
Borrowing for health or medical purposes, older adults (% age 25+	-7.02 (6.04)	-0.58(0.74)
Borrowing for health or medical purposes, young adults (% age 15-24)	0.31 (1.32)	-0.003(0.401)
Borrowing for health or medical purposes, primary education or less (% age 15+)	1.28 (0.66)*	0.22(0.26)
Borrowing for health or medical purposes, secondary education or more (% age 15+)	8.20 (4.41)	0.03(0.10)
Borrowing for health or medical purposes, income poorest 40% (% age 15+)	0.211(3.84)	1.23(0.78)
Borrowing for health or medical purposes, income, richest 60% (% age 15+)	-0.257 (5.50)	0.57(0.51)
Borrowing for health or medical purposes, rural (% age 15+)	0.63 (1.46)	0.07(0.28)
Borrowing for health or medical purposes (% age 15+)	6.33 (6.74)	-0.60(1.10)
C	0.52 (0.04)	0.03(0.009)
Note: *p < 0.05 ** p < 0.01 ***p <0.001		

Source: Created by the Authors

Table 6 presents the estimated regression parameters for predicting credit card usage in high-income countries. In the case of high-income countries, borrowing for health or medical purposes, primary education or less (% age 15+) had a significant impact on credit card use. Data on low-income countries were not available, so the regression results could not be undertaken for low-income countries.

Table 6. Estimated Regression Parameters for Predicting Credit Card Usage in the High-Income Countries

Variables	Model 1
	b(SE)
Borrowing for health or medical purposes, male (% age 15+)	-3.54(3.64)
Borrowing for health or medical purposes in labor force (% age 15+)	-3.39(3.66)
Borrowing for health or medical purposes, out of labor force (% age 15+)	-0.42(2.03)
Borrowing for health or medical purposes, female (% age 15+)	-8.27(5.63)
Borrowing for health or medical purposes, older adults (% age 25+	-0.58(0.74)
Borrowing for health or medical purposes, young adults (% age 15-24)	-0.05(1.29)
Borrowing for health or medical purposes, primary education or less (% age 15+)	1.37(0.64)*
Borrowing for health or medical purposes, secondary education or more (% age 15+)	8.13(4.29)
Borrowing for health or medical purposes, income poorest 40% (% age 15+)	0.61(3.72)
Borrowing for health or medical purposes, income, richest 60% (% age 15+)	-0.28(5.34)
Borrowing for health or medical purposes, rural (% age 15+)	1.11(1.41)
Borrowing for health or medical purposes (% age 15+)	6.62(6.54)
C	0.43(0.04)
Note: *p < 0.05 ** p < 0.01 ***p <0.001	

Source: Created by the Authors

6. Discussions

The existing studies on borrowing for health or medical reasons have explored several issues, and most of the issues that have been explored are the rising cost of healthcare (Wagner et al., 2011), the burden of healthcare expenditure and the reasons why individuals keep the credit cards (Xiao et al., 2011; Yang et al., 2007). The literature review section has emphasized the need for existing studies to explore how borrowing for health or medical reasons influences credit card use and ownership. Additionally, the review of the literature has also underlined that there is a need for existing studies to explore significant differences between borrowing for health or medical purposes by males and females.

The findings from this study showed that the highest mean value for borrowing for health or medical purposes was recorded for the poorest 40% of the population group in the case of high-income countries. Comparing this evidence to the context of low-income countries, individuals in the labour force above the age of 15 years recorded the highest percentage of borrowing for health or medical purposes. Intuitively, this research finding is parallel to the phenomenon present in high-income and low-income countries. Most of the high-income countries have well-developed financial markets, coupled with a greater percentage of the population having access to financial markets, and it can be argued that individuals and households are more likely to rely on credit cards to meet their short-term financing needs for health and medical purposes. In contrast to the phenomenon present in high-income countries, the per capita income of low-income countries is lower than the per capita income of high-income countries. This implies that the individuals and households in low-income countries are more likely to face financial hardship associated with managing health care costs due to the high cost of health care coverage and lack of financial budget available to the household. Rather than the greater likelihood of the poor cohort borrowing in the case of high-income countries, a working population who are easily able to meet the financial requirements of financial institutions are more likely to borrow for health or medical purposes.

Additionally, our research findings also indicate that there is a strong positive correlation between credit card ownership (% age 15+) and credit cards used in the past year (% age 15+). This indicates that as the credit card ownership increases (% age 15+), the likelihood of credit cards used in the past year will also increase (% age 15+). This research finding is consistent with the broader studies conducted by Meier and Sprenger (2010), Xiao et al. (2005), Babiarz et al. (2013), and Zinman (2009).

Our results also show that there are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Both Austria and Lithuania are high-income countries, but in the case of low-income countries, significant gender differences were found in Madagascar and Nepal. While comprising the borrowing behaviour of males and females in Austria and Lithuania, it was found that a greater percentage of males borrowed for health or medical reasons in Austria, whereas in the case of Lithuania, a greater percentage of females borrowed for health or medical reasons. The differences in the borrowing behaviour of males and females in the two highest income countries can be easily linked to the health care model present in the two countries (Schumacher and Zechmeister, 2013; London School of Economics and Political Science, 2017). Austria has a two-tier health care system, whereby everyone is covered under the publicly funded health care system, but individuals and households also buy private insurance health care schemes to access flexible healthcare services. Households may also borrow to pay for health care completely privately. Males are more likely to borrow for health or medical reasons, as 75% of males compared to 68% of females are employed in Austria (OECD, 2019). Lithuania has a modern state-funded health care system, whereby public spending on the healthcare system grew rapidly in the early 2000s. The Global Economic Crisis had a major negative impact on the health care system, leading to an unprecedented increase in the out-of-pocket increase of health care payments. Unlike numerous other countries around the world, women's health in Lithuania is much better than men's, and this explains the high percentage of borrowing for health or medical purposes by women (Purvaneckienò, 2019; World Health Organization, 2018). The health care system of Nepal is much better than

the healthcare system of Madagascar, as the health reforms in Nepal have improved the accessibility and delivery of the healthcare system. With greater accessibility of healthcare services, women in Nepal can borrow more than men, but in Madagascar, men are able to borrow more than women because women are less financially inclusive compared to men (Ministry of Health and Population, 2010).

The findings from this study also showed that borrowing for health or medical purposes, primary education or less (% age 15+) had a statistically significant impact on credit card ownership and usage in high-income countries. There was no statistically significant relationship found between borrowing for health or medical purposes and credit card usage and ownership in low-income countries. There are two reasons for the presence of this relationship in high and low-income countries. Firstly, individuals with primary education or less may not be able to meet the rising cost of healthcare, as most individuals in this category have low income. This implies that they may use credit cards for short-term health financing needs. Secondly, in low-income countries, individuals may not be able to easily meet the requirements and undertake risks for holding credit cards. As a result, it is less likely that borrowing for health or medical purposes has a significant impact on credit card use and ownership.

The research findings from this study are theoretically consistent, as the regression results indicate that in high-income countries, individuals have better access to the financial facilities provided by the bank and non-bank financial institutions. In these high-income countries, individuals whose income is insufficient to meet the rising cost of healthcare may have the intention to own and use credit cards for health or medical purposes. This intention would lead to the actual behaviour of using credit cards for health or medical reasons. Consistent with the Theory of Planned Behavior on credit card use and ownership, individuals in low-income countries may not meet the requirements of owning and using the credit cards stipulated by the bank and non-bank financial institutions. There are risks and costs associated with owning and using credit cards, and these risks can be mitigated if individuals and households have sufficient cash flows to meet the fee requirements of holding and using credit cards.

7. Scientific Novelty and Practical Value

This study's findings have practical and scientific value for health care service providers, government policymakers, and users of health services. According to SDG 3, healthcare, and the wellbeing of everyone can be improved by putting an end to epidemics and infectious diseases (Rokicki *et al*., 2021; Fryatt & Bhuwanee, 2017). This requires universal health coverage that is a critical component of sustainable development and reduces social inequities. The findings from this study confirm that financial innovations, such as credit cards, provides individuals and households in high-income countries with short-term financing needs for health and medical purposes. Unfortunately, individuals in low-income countries cannot benefit from credit card financing as most of them do not own credit cards. Importantly, the SDG on universal health coverage can only be achieved if policymakers and health care providers integrate financial innovations with the delivery of health services.

8. Conclusion, Limitations and Directions for Future Research

To conclude, this study achieved its aim by exploring the relationship between borrowing for health or medical purposes and credit card use and ownership. The findings from this study confirmed that there is a strong positive correlation between credit card ownership (% age 15+) and credit cards used in the past year (% age 15+). Additionally, this study also found that borrowing for health or medical purposes, primary education or less (% age 15+) had a statistically significant impact on credit card ownership and usage in high-income

countries. There was no statistically significant relationship found between borrowing for health or medical purposes and credit card usage and ownership in low-income countries. The findings from this study are consistent with the propositions of the Theory of Planned Behavior and the limitations of this study as a guideline for designing future research studies.

There are a couple of limitations of this study, and these limitations can be easily addressed by future studies on borrowing for health or medical purposes and ownership and use of credit cards. This study is based on a sample of 74 countries, which implies that the generalizations from this study are limited only to higher income and low-income countries. The investigation of the two research questions proposed in this study by using data from lower middle income and upper-middle-income countries would expand this study. This is both a cross-sectional and time-series study that can be easily extended by collecting data for a 30 years period. Unfortunately, data of such nature are only provided for a limited period in the Global Findex database. Future researchers can contribute to the literature by collecting data from alternative databases that provide proxies for measuring borrowing for health or medical purposes for a 30-year period.

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Suwastika NAIDU is a Senior Lecturer working for the School of Business and Management, University of the South Pacific. She is the co-editor of the Island Studies Journal (ERA 2010: B Ranked Journal). She is a graduate of the University of the South Pacific, the University of London, and Northern Arizona University. Her current research interests are in small business innovation and international trade.
ORCID ID: 0000-0003-3657-4033

Fang ZHAO is the Professor of Innovation and Strategy and Associate Dean – Research and Enterprise at Staffordshire Business School, Staffordshire University, UK. She has published over 110 research works internationally and in some of the leading top-tier journals in the study fields. Zhao's current research focuses on innovation strategy, smart cities, impact of Covid-19 on SMEs and digital transformation.
ORCID ID: 0000-0003-3718-6999

Atishwar PANDARAM is a Lecturer working for the School of Business and Management, University of the South Pacific. He has completed his PhD at the University of Wollongong. His current research interests are in service quality and total quality management.
ORCID ID: 0000-0002-9242-6169

Anand CHAND is the Professor and Deputy Head of School (Teaching & Learning) at the School of Business & Management, University of the South Pacific. He has a BA (Tasmania, Australia), Post-Graduate Diploma (USP), Diploma in Business Studies (Canterbury, NZ), MA in Industrial Relations (USP), MA in Research Methods (Manchester, UK), PhD (University of Cardiff, Wales, UK). Dr Chand has been teaching, conducting research, doing consultations and publishing for the last 32 years. He teaches both undergraduate and post-graduate courses (including MBA) and supervisors M.Com and PhD students. He has published 2 books, 2 monographs, 6 book chapters, and 39 articles. Anand has also presented around 40 papers at international conferences. His current research interests are in green human resource management, and small business management.
ORCID ID: 0000-0001-6343-6699

Arvind PATEL is a Professor of the School of Accounting and Finance at the University of the South Pacific. A graduate of the University of South Pacific, University of New South Wales, and the University of Queensland in Australia. His research interests are in corporate governance, auditing, financial accounting, business finance and information systems. Publications included in top tier journals in information systems, accounting, and economics. Current research interest in CEO succession and stock crash risk.
ORCID ID: 0000-0002-3223-7585

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STRATEGIC PRIORITIES FOR THE FORMATION OF SOCIAL RESPONSIBILITY OF BUSINESS

Natalya Ushenko [1], Viktoriia Blyzniuk [2*], Oleksii Dniprov [3], Tetiana Ridel [4], Natalia Kurbala [5]

[1] *National Aviation University, 1, Liubomyra Huzara ave., Kyiv, 03058, Ukraine*
[2] *Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine, 26 Panasa Myrnoho St., Kyiv 01011, Ukraine*
[3] *Office of the President of Ukraine, st. Bankova, Kyiv, 11, 01220, Ukraine*
[4] *Sumy National Agrarian University. vulytsia Gerasima Kondratyev, 160, Sumy, 40000, Ukraine*
[5] *Oles Honchar Dnipropetrovsk National University, 72 Gagarin Avenue, Dnipro, 49000, Ukraine*

E-mail: [2]v_blyzniuk@ukr.net (Corresponding author)*

Abstract. The social function of business is most effectively implemented through the mechanism and tools of the concept of corporate social responsibility (high quality standards, responsible manufacturing, employee care, social and progress reporting, law-abiding cooperation with the state, transparent business, refusal to produce harmful to health products, etc.). The purpose of the paper is a comprehensive analysis of theoretical-methodological principles of corporate social responsibility, the dominants of its formation and implementation in modern world models, as well as substantiation of strategic priorities of Ukrainian socially oriented model of corporate social responsibility in the national economy. The fundamental methodological basis of the study is a set of methods of scientific cognition, the principles of dialectical, structural-functional and empirical approaches. It is argued that the Ukrainian model of corporate social responsibility is in its infancy. The specifics of the Ukrainian model of corporate social responsibility include the lack of basic principles of responsible behavior of enterprises throughout the country, weak motivation for such practices, lack of state support for the formation of the institutional environment of corporate social responsibility, significant corruption barriers. It will be effective to implement the model of corporate social responsibility within a socially oriented model, in which public institutions and the state play a key role, under conditions of minimizing the level of corruption and strict adherence to socially oriented strategic priorities of the country development on the basis of systematic monitoring, analysis and practical measures for qualitative improvement of macroeconomic indicators of the economy. Priority areas for effective formation of the national model of social responsibility of Ukrainian business have been identified.

Keywords: business; social responsibility; business transparency; national model; social report

1. Introduction

The concept of sustainable development, which is based on the principles of harmonization of the three defining spheres of public life by ensuring the development of an efficient economy, the formation of civil society, the preservation of natural potential, has become the global trend of overcoming the negative consequences of global economic, social and environmental problems at the turn of XX-XXI centuries. In today global competitive environment, this concept is a strategic vector of sustainable development of countries seeking to fully reproduce the national resource potential, to minimize the negative impact of irrational use of natural and human resources in all spheres of public life.

Undoubtedly, entrepreneurship (business) plays a leading role in the formation of a market economic system and ensuring progressive socio-economic development (Dwivedi & Weerawardena (2018); Mura, & Hajduová, (2021)). Given the complexity of goals and multifaceted priorities of sustainable development strategy, corporate social responsibility is one of the main ideological and practical tools for its implementation, the effective implementation of which has significant potential in solving a number of socially significant problems of today for ensuring the economic, social and environmental security of the state through reducing unemployment, dramatically increasing the efficiency of the productive potential of the country, maintaining social balance in society during economic and political crises.

The vast majority of studies on the phenomenon of corporate social responsibility is devoted to solving current problems of formation and development of corporate social responsibility, as modern companies and large corporations have the most promising tools to influence society not only at the micro level but also globally (Chou (2018)).

Deepening of theoretical-methodological approaches to identifying the dominants of the formation of national models of corporate social responsibility, identifying ways to effectively implement them in the economy require systematic study and justification (Aquino et. al (2018)). Therefore, the study of the specifics of the formation of global models of corporate social responsibility will make it possible to identify the most significant and priority areas for the development of corporate social responsibility in the national economy.

There is an objective need to study current issues of social responsibility with further development of ways to achieve a synergistic effect from its introduction into business practice to the development of an efficient Ukrainian economy and socially oriented market system of national economy. Such goals correspond to the strategic priorities of the development of the state and society as a whole. The theoretical and practical importance of the above issues explains the selection of the study subject.

2. Literature review

In the process of comprehension of the concept of corporate social responsibility, scientists are increasingly inclined to the theory of social contract, according to which the social contract, which is created by society itself, imposes responsibilities on the business sector, but at the same time, society shows its commitment to those enterprises that comply with the requirements of the social contract (Gupta Bansal et. al (2020)). That is, society expects the following components as dividends to improve the life of society: improvement of the quality of products and services in accordance with international standards (Zahra & Wright (2016)), strict compliance with applicable laws (Saebi et. al (2019)), lack of corrupt schemes of activity (Spence (2016)), prevention of harm to the population (Haugh & Talwar (2016)), and the environment (Bansal et. al (2019)), etc.

The theory of the social contract boils down to the fact that businessmen must follow a balanced strategy and consider social goals not as derivatives, but as the main ones at the same level as economic ones (Rawhouser et. al

(2019)). In our opinion, this concept is optimally balanced in the modern social, political and economic realities of all developed countries.

Today, the concept of effective business activity in addition to innovation and risk includes the concept of responsibility to society, the creation of new values in society and the formation of social patterns of behavior of individuals (Perić & Delić (2016). The social component of business in the XXI century. includes a fairly wide range of responsibilities to employees, investors, the community, the state, the environment, in particular (Ferreira et. al (2017)): observance of norms and standards of quality of the manufactured products, creation of jobs and comfortable working conditions, care of own workers, environmental safety, formation of business culture, maintenance of balance of nature use and conformity to principles of sustainable development.

In the new millennium, the social function of business of the XXI century has acquired a global nature. Today, the growing global interest of business of various scales in the issue of their own social responsibility and social reporting to society, the state and the world community is becoming an obvious fact (Chell et. al (2016)). To achieve long-term development goals, large business is increasingly selecting a strategy of social responsibility to solve the problem of maintaining a high level of competitiveness in the market and to help solve global problems of today (Macke et. al (2018)).

However, Ukraine lags far behind in the adoption of world standards of doing business under the influence of political and socio-economic reasons, and social responsibility is perceived in Ukrainian society not as a philosophy of doing business, but as imposing of social demands and pressure from the state. On the one hand, Ukrainian science does not pay enough attention to the study of theoretical aspects of establishing the relationship between corporate social responsibility and the level of development of social capital of society.

On the other hand, Ukraine is characterized by the lack of a balanced state policy, an effective legal framework and an effective institutional mechanism for the implementation of corporate social responsibility, the absence of pressure from civil society and non-financial organizations. In conditions of political and economic instability, military conflict and terrorist threats, only a combination of both theoretical and practical actions to form a socially responsible Ukrainian business will allow to overcome the social and economic crisis in the country.

3. Research Methodology and Data

The fundamental methodological basis of the study is a set of methods of scientific cognition, the principles of dialectical, structural-functional and empirical approaches. The scientific results of the study were obtained as a result of the application of general scientific and special methods: methods of analysis, synthesis and generalization; system method (to determine the dominants of the formation and implementation of corporate social responsibility in world models, instruments of regulatory influence of the state and institutional support for the development of corporate social responsibility; visual-graphic method and structure of corporate social responsibility; method of SWOT analysis (to assess the possibilities of implementation of the principles of socially responsible business in Ukraine.

The information base of the study was monographs, scientific publications of scientists in periodicals, reports and analytical publications (United Nations, International Anti-Corruption Organization, Organization for Economic Cooperation and Development, European Commission, International Organization for Standardization), laws of Ukraine, author's calculations based on the official information of the State Statistics Service of Ukraine, which ensured the representativeness of the initial data, provability and reliability of conclusions, practical recommendations and proposals.

The purpose of the paper is a comprehensive analysis of theoretical-methodological principles of corporate social responsibility, the dominants of its formation and implementation in modern world models, as well as substantiation of strategic priorities of Ukrainian socially oriented model of corporate social responsibility in the national economy.

4. Results

World practice proves that the development of the economy, improving the quality of life, strengthening social ties contribute to the spread of the practice of corporate social responsibility at all levels of economic activity. Conversely, political and economic instability, lack of financial resources, weakness of legal protection cause minimal participation of small and medium-sized businesses in staff development, accumulation of human capital, greening of production.

In the economies of developing countries, social responsibility is mainly implemented by large corporations, which activities meet international standards. This situation is typical for the economy of Ukraine, as only large companies are able to autonomously, regardless of the political situation and pressure from the authorities to demonstrate a tendency to the ideas of social responsibility, to implement certain social and environmental strategic programs. And medium and small businesses mostly stay away from high ideals and direct all their energy to profit maximization.

Corporate social responsibility is sometimes called corporate conscience, or social work of the enterprise. It is a form of corporate self-regulation, which is integrated into a business model of behavior. Therefore, the analysis of social responsibility is conducted through the prism of corporate social responsibility, as actually large corporations have the most powerful potential for innovation in business and have the most tangible social effect in society.

The number of participants joining the UN international social responsibility initiative, namely the Global Compact is growing steadily every year (Figure 1). The main purpose of this agreement is to demonstrate progress in addressing the issues of human rights, labor relations, the environment and the fight against corruption.

Fig. 1. Dynamics of growth of companies participating in the Global Compact
Source: author's calculations based on Global Compact Network Ukraine (2020)

According to Figure 1, for the period under review, the highest growth rates relative to the number of companies were in 2010/2009. During 2010–2015, there was a decrease in the number of companies, and from 2017 — a gradual increase. In 2006, Ukraine joined the UN Global Compact. As of 2015, the number of Ukrainian companies, social organizations, business associations and non-governmental organizations that joined the Global Compact is 292, although in 2006 there were only 46 (Figure 2).
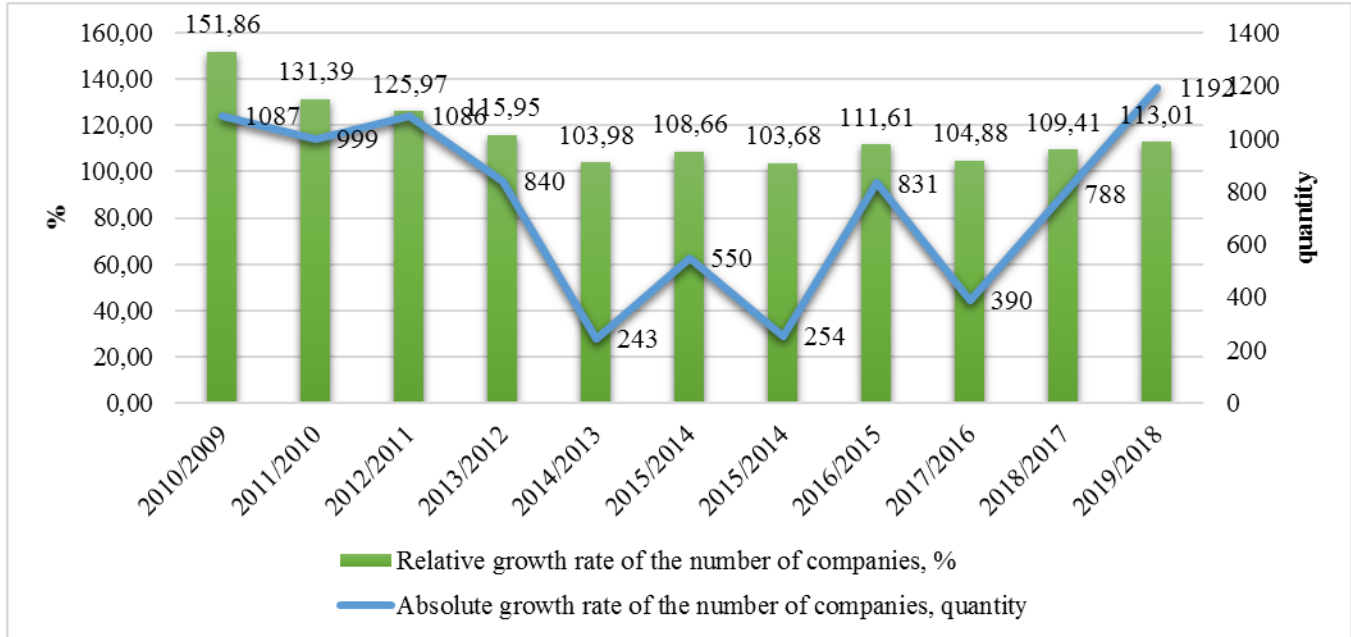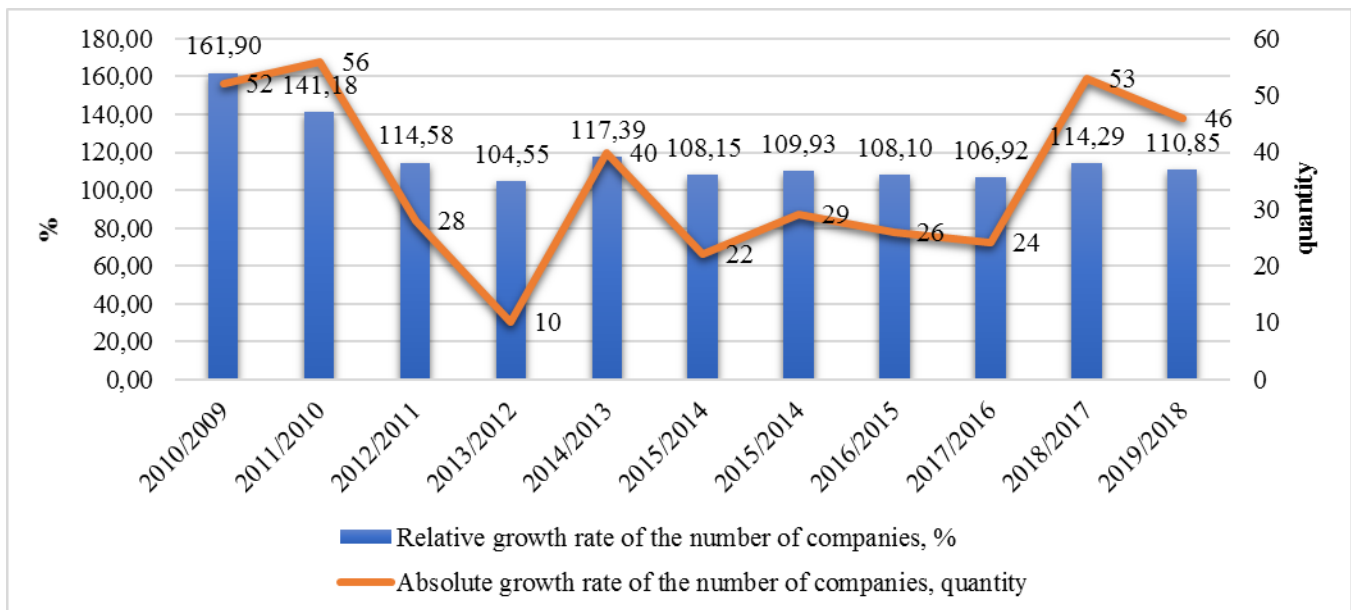

Fig. 2. Dynamics of growth of Ukrainian companies participating in the Global Compact
Source: author's calculations based on Global Compact Network Ukraine (2020)

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A necessary condition for the effective formation of the institutional environment of the phenomenon for the implementation of corporate social responsibility is the low level of corruption in the economic system, and therefore the level of transparency of business activity should be high. A study of the level of transparency of doing business in Ukraine proves that the underdevelopment and unpopularity of the principles of corporate social responsibility is a consequence of the high level of corruption in the Ukrainian economy.

In the rating of the level of transparency of doing business, Ukraine has a very low place, which is recognized by experts and social organizations. In 2019, the country was ranked 142nd (Ukraine in the rankings: how the positions of the country changed in 2014–2019 (2019)). Unfortunately, this trend has been going on for a long time and Ukraine has not risen above the 99th position, which characterizes Ukraine as a country with unformed institutional preconditions for the development of corporate social responsibility, although at the time of the collapse of the USSR in 1991, the country ranked 5th in the world in terms of both economic and intellectual development potential.

Despite the large number of codes, laws, instructions and regulations governing aspects of corporate social responsibility in Ukraine, the direct practical implementation is regulated only by certain elements (labor relations, social protection, state subsidies) of corporate social responsibility. The results of the content analysis of the legal support of corporate social responsibility in the Ukrainian economy state the inability to effectively implement most of the existing positive examples of world practice of implementing the national model of corporate social responsibility.

However, despite the significant negative trends in the process of legal regulation of corporate social responsibility in Ukraine, there are some positive changes in this direction. In particular, Article 48 of the Law of Ukraine "On Environmental Protection" as amended (1991)) outlines the instruments to stimulate the rational use of natural resources and environmental protection through:
- benefits in the taxation of enterprises under the conditions of their implementation of measures for the rational use of natural resources, the transition to low-waste energy-saving technologies, as well as under conditions of production greening;
- granting short-term and long-term loans on preferential terms to implement measures to ensure the rational use of natural resources and environmental protection;
- exemption from taxation of environmental protection funds;
- transfer of part of the funds of environmental protection funds on contractual terms to enterprises for measures to ensure the reduction of emissions of harmful substances that adversely affect the state of the environment, as well as for measures aimed at the development of environmentally friendly production technologies.

Effective development of Ukraine should be strategically closely linked to the concept of integrated development, in which economic development does not contradict the maintenance of environmental and social balance of the country. The formation of a national model of corporate social responsibility is a strategically important factor for achieving stable economic development of the country, especially in conditions of political and economic instability. To stabilize economic and social processes in Ukraine, a necessary condition is to identify and use potential opportunities for the implementation of socially responsible activities of enterprises.

It should be noted that none of the existing models can be applied in Ukraine in the outlined version, as the current stage of development of social responsibility of Ukrainian business is characterized by blurred trends in following the principles of socially responsible activities and lack of support for social initiatives by the state and society as a whole. Each company is not responsible for its own activities and its consequences on a full-scale basis and in accordance with international standards, which is a consequence of the presence of an element of

political pressure and significant corruption of government structures that hinder the effective formation of civil society and social capital as the main drivers of corporate social responsibility.

In general, the Ukrainian model of corporate social responsibility, which is in the process of formation, tends to a socially-oriented model. However, today social responsibility is perceived by Ukrainian businessmen rather as a marketing or PR technology, i.e., it is at the stage of initial formation in terms of global perception, and is limited to social actions and, accordingly, in this form can not contribute to sustainable development both at micro- and at macro levels, as well as increasing the competitiveness of the national economy in the long run.

Ukraine has long enough suffered from various social, economic and political problems caused by corruption, high levels of criminalization of society, the outflow of intellectual elite to developed countries (according to various sources, between 5 and 7 million people left Ukraine during the period of independence), inefficient industrial and agricultural policy, lack of modernization strategy. As a result, there is a rapid degradation of the environment, a growing gap between the incomes of the richest and the poorest citizens of the country. To overcome these problems, a necessary conditions is a systemic transformation of political and economic development strategy of Ukraine, large-scale personnel change and intensification of pressure of non-governmental organizations on the government and business, which would actively promote the principles of corporate social responsibility and active state participation in this process, monitor transparency of business activities and management efficiency.

The strategy for the implementation of corporate social responsibility and support based on the results of the SWOT analysis should take into account the theoretical negative consequences of the implementation of the concept in Ukraine (Table 1).

The potential dangers and difficulties for businesses and society are as follows:
-   Due to the insufficient level of social capital and the corresponding development of civil society, there is a risk of rejection of business as a carrier of social benefits, which will ultimately lead to a strengthening of the negative relationship between society and business;
-   Existence of probability of non-fulfillment by businessmen of declared social programs in case of political and economic crises in the country.

Table 1. Matrix for evaluation of the options of introduction of corporate social responsibility in Ukraine

Factors, level	Option impact		
Option use probability	Maximum	Moderate	Minimum
High	Integration of all characteristics of corporate social responsibility into the national model of development of the country	Increase in the transparency of the practical implementation of activities related to social responsibility (through the spread of social reporting)	Impact of global socio-economic processes on the informatization of society regarding the corporate social responsibility
Average	Development of public-private partnership and institutional support of socially responsible businesses	Long-term formation of the environment of competitive advantages of national business	Cooperation with local communities to address local social and environmental problems
Low	Short-term increase in investment in the social and environmental areas	Partial modernization of the quality management system in production at the cost of introduction of the principles of international standardization	-

Source: author's research

In order to form the Ukrainian model of corporate social responsibility in the conditions of unstable political and economic situation in the country it is necessary to carry out the analysis of advantages, promising areas, restraining factors and possible threats. The ratio of positive and negative consequences is important in this case. Table 2 contains the results of the analysis of advantages and restraining factors, prospects and threats of the introduction of corporate social responsibility in Ukraine.

Table 2. Advantages and restraining factors of development of socially responsible business in Ukraine

Advantages	Restraining factors
Support of business socialization processes by international organizations and non-profit organizations; the presence of examples of effective doing business on the basis of social responsibility, which significantly increase the reputational capital of enterprises.	Lack of effective institutional support of the state for socially responsible programs of companies and appropriate incentives for its implementation; misunderstanding by the state of the mechanisms of implementation of social responsibility of business, its subject and economic model; widespread corruption, which undermines the values and principles of socially responsible behavior of enterprises; closedness of Ukrainian companies to the general public; the internal nature of the direction of socially responsible activities of enterprises.
Prospects	Threats
Spread in Ukraine of production organization quality management systems; development of innovations in the social area; formation of a positive attitude and public confidence in the participation of enterprises in solving social problems; creation of competitive advantages for the national economy; formation of social dialogue as a consequence of public-private partnership in solving social problems in society.	Lack of management staff in this area and intellectual content can lead to failure to obtain the desired social effect from the implementation of social responsibility by business; the risk of the lack of active position formed in the minds of citizens on participation in the implementation of social responsibility on the basis of social partnership may lead to the leveling of the potential of this area of business development.

Source: author's research

At the initial stage, priority areas for the development of corporate social responsibility for the national economic system should be identified. In our opinion, there should be five such areas, namely:

1)   Social: timely and full payment of wages, rejection of "shady" wage schemes; compliance of companies with the standards of the International Labor Organization in the area of workplace safety, health care; certification of management of enterprises of the region for compliance with international standards; certification of company management for compliance with ISO 26000; an audit of corporate responsibility or its separate parts at

enterprises (audit of social and labor relations and environmental audit); preparation at the initial stage of non-financial reports of companies in any form and bringing them to the public through a special section of the corporate website, corporate press, through the global Internet, through the media; preparation of non-financial reports in accordance with leading international standards (GRI, AccountAbility 1000); development of corporate philanthropy, creation of social programs aimed at solving social problems in the territories of companies, the use of criteria for evaluation of their effectiveness to continue programs or develop new ones; co-financing with local government organizations of projects for the development of social infrastructure, development of social services.

2) Environmental: active participation and assistance in the development of environmental policy of the city, region; creation of a consortium of universities, development together with the authorities, scientists and ecologists of the environmental program of the most problematic, polluted regions of the country; introduction of environmental management of companies operating in the region, its certification for compliance with ISO 14000 series (environmental management system); introduction of modern technologies and voluntary participation in environmental compliance certification of manufactured products; an independent public environmental expertise regarding establishing cooperation with regional environmental authorities in order to develop and implement joint environmental programs; cooperation with educational institutions regarding improvement of the environmental education of graduates (possibly within the framework of mentoring programs), the organization of excursions to enterprises to get acquainted in practice with the latest technologies for environmental protection.

3) Legal: agreements between business managers and local authorities on cooperation within the framework of the national strategy for integration of socially responsible activities of enterprises; legislative consolidation of the participation of business and public representatives in the development of regional development strategies, ensuring the consideration of the interests of regional companies in the development of draft documents that form the legal framework in the area of taxation, subsoil use, ecology and other areas.

4) Organizational: creation of the association of large businesses of Ukraine including the center of social responsibility of enterprises with training and consultation functions; creation of public councils for territorial development together with business representatives; creation of similar structures for local governments; establishment of organizational-methodical bases of interaction with the office of the regional authorized representative; establishment of constructive cooperation with the authorities on the implementation of relevant government programs and major projects to forecast the strategy and prospects for the development of corporate social responsibility; organization of interaction with similar organizations of development of principles of the center of social responsibility of enterprises of the developed states; involvement of companies in dialogue with external stakeholders (including public organizations representing the interests of the population), holding public hearings at the stage of preparation of investment projects; creation of funds of local communities, which accumulate money of corporate and private donors to solve local socio-economic problems.

5) Image: active participation of the media in forming a positive image and informing the public about the social activities of companies operating in the region; organization of the competition and establishment of the award "The best company of the region" in various nominations, including the center of social responsibility of enterprises; holding conferences, creating a permanent forum for the exchange of experience and best practices in the area of corporate social responsibility with the participation of experts from leading companies operating in other districts and foreign experts.

The mission and philosophy of an enterprise developed taking into account the principles of social responsibility in combination with a critical assessment of the internal and external environment of its own operation is the basis for developing a strategy of interaction with society and business. The practical implementation of corporate social responsibility can enhance the internal constructive potential of business and, as a consequence, prevent the onset of economic and environmental crises, and in case of their onset — reduce the cost of overcoming them.

Political and economic instability form the preconditions for reducing the level of corporate social responsibility, as the main issue of business activity is the idea of "survival" in the market and, accordingly, to obtain the maximum possible benefits in the short term. But if the company is able to withstand social and economic

pressure and maintain an integrated strategy of its own long-term development, without deviating from the key points of the theory of social responsibility, then, over time, a much higher level of trust and commitment will be formed in society, in contrast to the enterprise, which aimed only at its own selfish interest. If the activities of a company are not socially oriented, the preconditions are formed for the application of unpopular measures to reduce the costs of the enterprise, namely: dismissal of employees, reduction of wages, reduction of bonuses, surcharges, etc. As a result, there is a further development of crisis phenomena of a socially oriented nature.

Priority areas for effective formation of the national model of social responsibility of Ukrainian business have been identified: stimulation of the growth of the level of transparency of companies (mandatory social reporting and reporting on progress based on internationally established standards); application of tax preferences, public investment programs, public-private partnership projects to solve problems in the area of social services, basic infrastructure and environmental safety; informing the public about the role and consequences of corporate social responsibility in the development of socio-economic relations in society by forming an appropriate level of social capital in society; stimulation and support for discretionary types of corporate social responsibility; scientific-research and technical-organizational support of the state for the study of theoretical-methodological and practical methods of improving the effectiveness of the introduction of corporate social responsibility in the strategy of national development.

5. Discussion

For Ukraine at the initial stage of formation of the model of corporate social responsibility in the transitional and extremely difficult period of formation of civil society the most common is the creation of a social reporting mechanism at the state level, the main purpose of which is to supplement financial information with a clear demonstration of social activity and usefulness to society.

It should be remembered that the state and its methods of influence play a huge role in the formation of social responsibility of Ukrainian business (Tiba et. al (2019)). In itself, the social responsibility of Ukrainian business is not able to develop on a national scale. Only the state has the ability to provide legal and economic support.

Moreover, only the state can stimulate, motivate, and even to some extent morally inspire the business sector to activities, which are socially responsible. State methods must be used to create institutionally favorable conditions for enterprises to conduct socially responsible activities (Urmanaviciene & Arachchi (2020)). These aspects relate to statutory rules and regulations for doing business. This also applies to the reassessment of state economic incentives for corporate social responsibility, namely (Cheema et. al (2020)): tax benefits, government financing programs, lending, protectionist policies, etc.

Elements of the development of corporate social responsibility constitute a complementary system of incentives, conditions and motivational mechanisms for responsible behavior of enterprises (Szegedi et. al (2016)). The degree of responsibility of business to society and the environment depends on the effectiveness of relations between the state and business (Johnstone-Louis (2017)).

The advantages of the effective implementation of a model of corporate social responsibility are the establishment of rules for dialogue between the state and business, the values of respect for the rights and responsibilities of each party, increasing the effectiveness of state regulatory mechanisms. Therefore, even those possible threats that society may face will have only temporary nature. In the long run, it is strategically correct for the progressive development of the country as a whole to fully introduce theoretical approaches to corporate social responsibility in practical recommendations for action.

In essence, this means that if corporate social responsibility becomes an integral part of activities of Ukrainian companies, the likelihood of improving the overall well-being of society and the effectiveness of crisis management will be obvious. In order to increase the transparency of companies, it is necessary to develop a state program of a motivational mechanism for preparation of non-financial reports in accordance with international standards. At the same time, to verify the veracity of non-financial reports, it is advisable to establish a National Service for Auditing of Corporate Social Responsibility and Non-Financial Reporting, as an effective system of social and environmental reporting of business, which has a national character, is an instrument to address social and environmental issues in the long run.

Conclusions

The paper identifies the restraining factors of the formation of an effective national model of corporate social responsibility in Ukraine: extremely high level of corruption in economic relations, inefficient development policy of the country in all areas (economy, ecology, social sphere, international relations, etc.), unprofitable state social policy and lack of social investment, lack of effective institution of social partnership between employees and employer, lack of analysis of real socio-economic indicators of life and their effective adjustment, insufficient level of pressure of local communities and non-profit organizations on business, lack of institutional preconditions for the formation of mechanisms for socially responsible activities of companies.

At the same time, there are some progressive trends in the formation of a national model of corporate social responsibility, the main forms of which are: ensuring the labor rights of staff, creating internal codes, tools and social standards of management, compliance with basic state requirements for providing social guarantees for employees, payment of statutory compensation. At the same time, these aspects of Ukrainian corporate social responsibility have only a nominal relation to this business development strategy, as they do not fulfill the main task — promoting the welfare of society and the implementation of the principles of sustainable development.

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Natalya USHENKO, Doctor of Economic Science, Professor, National Aviation University, Ukraine
ORCID ID: orcid.org/0000-0002-3158-4497

Viktoriia BLYZNIUK, PhD in Economics, Senior Researcher, Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine
ORCID ID: orcid.org/0000-0003-2265-4614

Oleksii DNIPROV, Doctor of Law, Head of the Office of the President of Ukraine
ORCID ID: orcid.org/0000-0002-7157-9748

Tetiana RIDEL, PhD in Educational Sciences, Associate Professor, Sumy National Agrarian University
ORCID ID: orcid.org/0000-0002-6980-7975

Natalia KURBALA, PhD in Economics, Associate Professor, Oles Honchar Dnipropetrovsk National University, Ukraine
ORCID ID: orcid.org/0000-0002-6980-7975

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THE IMPACT OF THE PUBLIC DEBT OF A COUNTRY ON THE SUSTAINABLE DEVELOPMENT OF ENTREPRENEURSHIP

Dmytro Zhuravlov [1], Mykhailo Prokhorenko [2]*, Tamara Chernadchuk [3], Vitaliy Omelyanenko [4], Valentyna Shevchenko [5]

[1] *Office of the President of Ukraine, st. Bankova, Kyiv, 11, 01220, Ukraine*
[2] *National defence university of Ukraine named after Ivan Gherniakhovskyi, Povitroflotskyy Av., 28, 03049, Kyiv, Ukraine*
[3] *Sumy National Agrarian University, 160 Gerasim Kondratieva Street, 40000, Sumy, Ukraine*
[4] *Institute of Industrial Economics of National Academy of Sciences of Ukraine, 2 Zhelyabova Street, Kyiv, 03057, Ukraine;*
[5] *Alfred Nobel University, 18, Sicheslavska Naberezhna st., 49000, Dnipro, Ukraine*

E-mail: [2]* *prokhorenko@i.ua (Corresponding author)*

Abstract. It is substantiated that as of today the transition to the concept of debt sustainability, which affects the sustainable development of entrepreneurship, is dominant over other areas. The purpose of the study is scientific substantiation of the ways of transformation of debt management in Ukraine, taking into account the experience of EU countries, strengthening of the medium-term aspect of public and state-guaranteed debt management for the purpose of enhancement of sustainable development of entrepreneurship. An analysis of the best practices of the member states of the European Union, in particular the new member states of the European Union, regarding the experience of debt management, which is relevant for Ukraine, was carried out. On the basis of statistical indicators, it is substantiated that these countries in the implementation of public debt management strategy have effectively made the transition to debt management based on the concept of debt sustainability. The use of mechanisms and tools of the concept of debt sustainability in debt management allowed countries such as Hungary, Poland, Bulgaria, Latvia to significantly improve key debt indicators and indicates the correctness and feasibility of using this approach in modern conditions. It is proven that the main area of improving public debt management in Ukraine is the formation of a systematic approach to risk management on the part of the authorized body. This approach should include continuous monitoring of the full range of debt operations, analysis of the reasons, which led to deviations from the planned indicators and the application of the necessary management decisions aimed at the unconditional achievement of debt policy objectives.

Keywords: sustainable development; entrepreneurship; public debt; management strategy; debt sustainability

1. Introduction

The formation of effective management of public and state-guaranteed debt is one of the most important tasks in the area of public finance. With the help of government borrowing, additional financial resources are obtained, which can be used to implement public investment programs, finance other national needs, not provided with income. The use of state guarantees for loans of economic entities makes it possible to ensure the implementation of economic projects, which have an important social impact.

At the same time, in Ukraine since 2008, in times of crisis, borrowings have been used mainly to solve current budget problems, and state guarantees have not become an effective tool for economic growth (Sirenko et. al (2020)). This has led to a significant increase in the debt burden, at which the national economy is no longer able to work effectively.

Budget expenditures for public debt service have grown significantly, in 2018 their amount was 12/4 % of the revenue side of the State Budget of Ukraine (Husarevych (2019)). This state of the debt area requires new approaches to debt management, revision of the range of financial instruments, use of best practices of post-Soviet countries, which became members of the EU, improvement of debt risk assessment and monitoring, deepening cooperation with international financial organizations to stabilize the debt area and get out of the pre-default state.

The study of the range of tools for improving the management of public debt and state-guaranteed debt becomes especially relevant in the current conditions, because such effective management can increase the sustainability of the budget system, provide additional impetus to the national economy of Ukraine.

The sustainable development of entrepreneurship is influenced by macro-environmental factors, in particular financial ones. The increase in the public debt of country leads to a tight tax policy: increase in taxes, increase in the range of taxes, abolition of benefits and subsidies, constant tax monitoring of business activities. This is a disincentive to business development. The reputation capital of country is also decreasing, which significantly reduces the reputation capital of entrepreneurs in the global competitive market. All this leads to social destabilization at the macro level, and, as a consequence, increased migration abroad, reduced birth rates — reduced labor resources, both qualitatively and quantitatively.

2. Literature review

The problem of public debt management became more relevant in the second half of the 20th century, when states became unable to accumulate in the budget enough of their own financial resources to fully perform their functions and began to make loans in domestic and foreign markets (Lee & Ng (2015)).

At the present stage of market relations, public borrowing is considered as an objectively existing source of covering the budget deficit. Such financial resources are traditionally used by the governments of many countries to finance the budget deficit, provide long-term material resources for large investment projects on a national scale, as well as to create a certain standard in the domestic financial market — debt securities with the highest level of reliability (Owusu-Nantwi & Erickson (2016)). If such resources are directed to effective investment projects, then the invested funds and the public loan can be repaid at the expense of the flow of funds generated by the project, and in national economy the effect of increase in scale of the latter remains.

As of today, it should be noted that debt obligations, which relate to the area of public debt and state-guaranteed debt, are an organic component of the financial systems of the vast majority of countries, effective tools for financial macroeconomic regulation and implementation of economic strategy (Ahlborn & Schweickert (2018)).

The budget capacity of each country, the state of foreign exchange reserves and, as a consequence, the stability of the national currency, the level of interest rates, the investment climate, the nature of the behavior of all segments and participants of financial market, etc. depend on the nature of borrowings, repayments, debt service, and the current approach to public debt management.

Part of the scientists (Gómez-Puig M. & Sosvilla-Rivero (2018)) emphasizes that public debt is characterized by a certain amount of public debt, usually in national currency, to creditors on a certain date. Another part of scientists (Arčabić et. al (2018)) emphasizes the fact that public debt is a set of financial obligations of the state in the form of certain financial instruments (agreements) used to establish a certain type of relationship between our state, on the one hand, and economic entities of other sectors of the economy and foreign creditors, on the other.

Within the framework of these relations, free financial resources are provided by creditors in the form of a loan for use to the state of Ukraine, and it must repay and service this loan within the terms established in the agreements. Typically, financial instruments are government securities such as internal government bonds (IGB) and external government bonds (EGB) (Shkolnyk & Koilo (2018)).

The main reasons for the creation and increase of public debt are (Bondaruk et. al (2018)):
- the need to increase government expenditures in the absence of growth in government revenues;
- the need to reduce the tax burden (discretionary fiscal policy) without a corresponding reduction in government expenditures;
- maintaining the stability of the national currency by attracting funds from external creditors or international financial organizations;
- action of automatic stabilizers during the economic crisis: cyclical reduction of tax revenues when it is necessary to increase or at least maintain the level of social transfers;
- manifestation of debt risks, which leads to a decrease in the possibility of debt restructuring and the need for additional borrowing;
- the impact of political business cycles.

The appearance of debt is usually one of the consequences of the need to finance the budget. Theoretically, there are two options of such financing: monetary and debt ones, each of which has its advantages and disadvantages (Kim et. al (2017)). The use of monetary instruments to finance the budget leads to an increase in money supply and ultimately to rising inflation. The direct use of monetary financing is usually restricted by law. However, the creation of conditions for rising inflation indirectly affects the budget deficit, because it increases budget revenues through indirect taxes (including VAT), the amount of which is related to the price level.

The use of debt instruments to finance the budget leads to an increase in the debt burden and expenditures related with public debt service (Mencinger et. al (2015)). This, in turn, can lead to an increase in the state budget deficit if economic growth is insufficient.

Along with the significant achievements of scientists, further scientific research to solve debt problems in the context of dynamic changes in the state of the government borrowing market, the development of the national economy in conditions of global instability remains relevant.

At the present stage of economic development of Ukraine it is important to take into account the achievements of world financial thought, outline the conceptual foundations of new approaches to debt management, use best practices of crisis management within the concept of debt sustainability to increase budget transparency, create preconditions for reducing the debt burden of economy of Ukraine and its gradual exit from the crisis.

3. Research Methodology and Data

A set of general scientific and special methods was used to achieve the purpose of the study. In particular, with the help of the dialectical method of cognition, which allows to analyze economic phenomena in the process of development and interconnection, the economic essence of public debt as a component of public finance was studied. The substantiation of the categorical framework was carried out on the basis of the method of scientific abstraction. The method of historical-logical and comparative analysis was used to study the historical stages of formation of the public debt policy of Ukraine, graphical financial analysis was used to study trends in formation of public debt. Methods of analysis and synthesis, induction and deduction were used to justify the advantages of medium-term debt policy.

The information base of the study is the laws and regulations of Ukraine on the budget and public debt, materials of the Ministry of Finance of Ukraine, the State Statistics Service of Ukraine, the National Bank of Ukraine, the World Bank, the IMF, Eurostat, statistical yearbooks and newsletters.

The purpose of the study is scientific substantiation of the ways of transformation of debt management in Ukraine, taking into account the experience of EU countries, strengthening of the medium-term aspect of public and state-guaranteed debt management for the purpose of enhancement of sustainable development of entrepreneurship.

4. Results

Improving the management of public debt and state-guaranteed debt is an important task of public financial policy. The right guidelines for the management process increase the efficiency of the public finance system and reduce the negative impact of internal and external factors.

However, any management process may have certain risks of implementation of decisions, when these risks occur, the financial and economic effect of management may decrease. This fully applies to the area of public debt management, which, in accordance with the legislation of Ukraine, operates on the principles of unconditional fulfillment of debt obligations. The latter determines the priority of debt policy measures in the implementation of public financial policy. The whole set of measures to manage public debt and state-guaranteed debt must comply with the principle of macroeconomic stability: for a long time to ensure the resilience of the economy to internal and external threats and, at the same time, maintain the ability to sustainable economic growth.

However, as of today in Ukraine debt transactions have not become an instrument for achieving macroeconomic stabilization. The use of borrowed funds to meet current problems destabilizes public finances and the economy as a whole. Expenditures on public debt service are growing every year, which, in turn, requires a further increase in government borrowing.

It is necessary to take into account the fact that debt management is not a separate part of public administration. The debt area is closely related with the area of monetary relations, the taxation system, the efficiency of state expenditures, the level of the state budget deficit, the influence of foreign economic factors, etc.

For Ukraine, the process of rapprochement with the European Union is a strategic direction of foreign and domestic policy, modernization of the economy, attracting foreign investment, improving financial mechanisms and the budget system. The implementation of integration tasks causes appropriate changes in the formation and implementation of public debt policy. The appropriate policies of EU member states are based on the principles set out in the Stability and Growth Pact (2018).

One of the important provisions of the pact is the restriction on the ratio of public debt and state-guaranteed debt to GDP, which is set at 60 %. With regard to the debt area, the EU public finance management system also has the principles of avoiding excessive state budget deficits and constant control over the budgetary parameters of each member state (Treaty of Maastricht on European Union (1992)). In the event that a member state exceeds the general government debt to GDP of 3 %, certain measures of influence may be applied to it.

If these indicators are higher than established ones and stable from year to year, the European Commission launches the so-called Excessive Deficit Procedure, which provides for a fine of up to 0.2 % of GDP. The European Commission does not take measures to influence the government if the excessive budget deficit is reduced year after year, or if the deficit is exceeded once, but in the future is within the specified limits.

The implementation of such approaches in the financial policy of Ukraine is an urgent, important, but quite difficult task. For a long time, the budget is formed with a significant level of deficit, which causes an increase in debt, creates the preconditions for increasing financial risks. In particular, this is evidenced by the analysis of the dynamics and structure of public debt and state-guaranteed debt during 2010–2020.

For Ukraine, the real deterioration in the economic area and the growth of debt began at the end of 2008 and at the beginning of 2009. During this period, the execution of the state budget was complicated by both internal and external risks associated with the provision of tax revenues, mobilization of revenues from privatization, placement of external government bonds.

The dynamics of the state-guaranteed debt of Ukraine during 2010-2020 is presented in Figure 1. As you can see, the growth of state-guaranteed debt began in 2009 after the beginning of the global financial crisis. For example, if this figure as of the end of 2008 amounted to UAH 58.7 billion, in 2009 it rose immediately to UAH 90.9 billion.
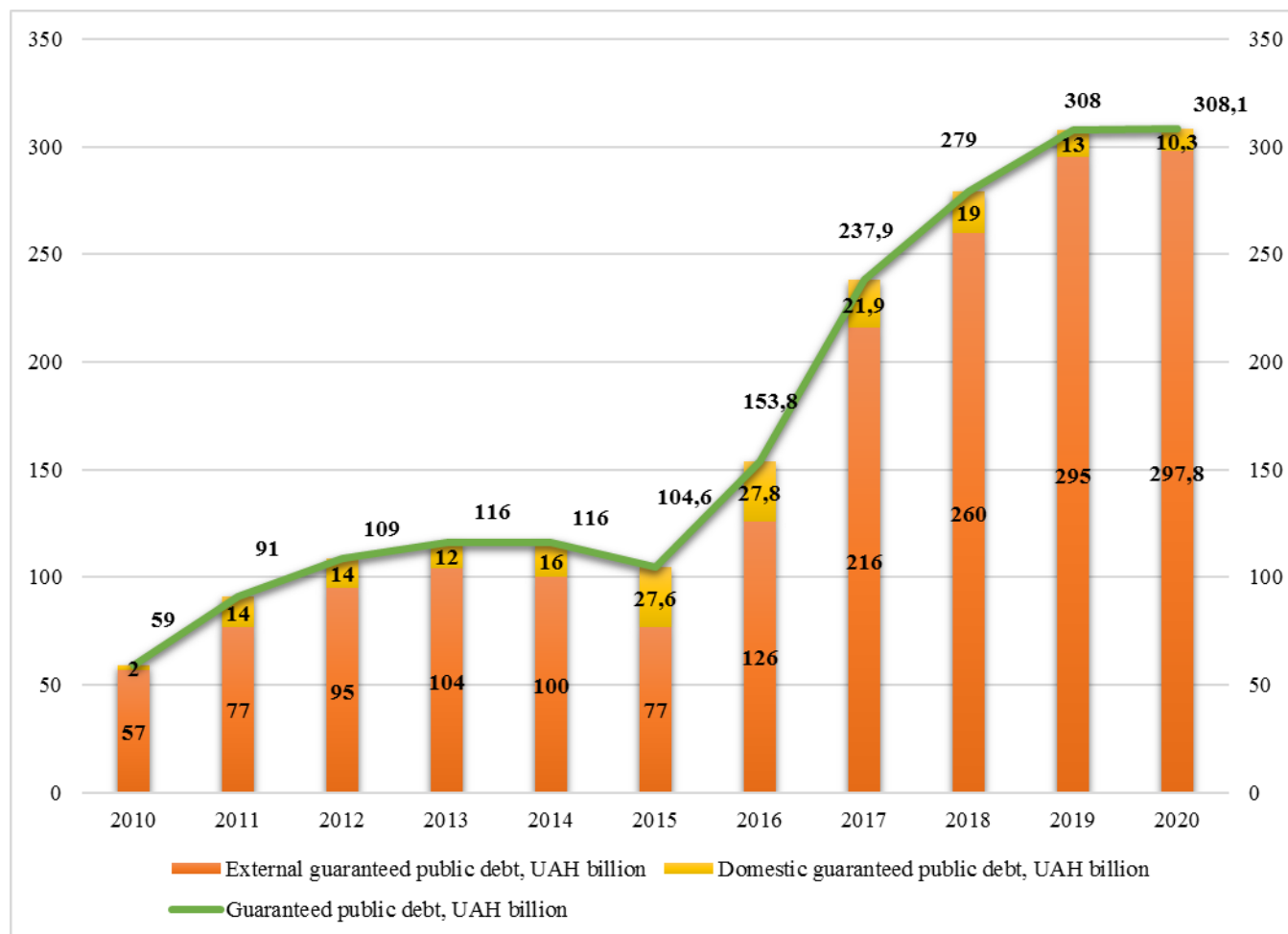
Fig. 1. Dynamics of the state-guaranteed debt of Ukraine during 2010-2020
Source: based on Ukraine Government Debt (2021)

During 2010-2012, the amount of state-guaranteed debt gradually increased and was UAH 108.8 billion at the beginning of that period and UAH 116.3 billion at the end of that period. Only in 2013, the amount of state-guaranteed debt slightly decreased to UAH 104.2 billion. Starting from 2014, the amount of state-guaranteed debt began to increase again — at the end of that year it reached UAH 153.8 billion. Later on, the growth of state-guaranteed debt was more dynamic. This indicator amounted to UAH 237.9 billion in 2015, UAH 278.9 billion — in 2016, UAH 308.0 billion — in 2017. In 2018, it remains almost unchanged compared to 2017 — UAH 308.1 billion. The main factor of the dynamic changes in the state-guaranteed debt indicator were changes in the amount of external state-guaranteed debt. As can be seen, in the general structure of the guaranteed debt for 2009–2018, the external guaranteed debt averaged 87.0 %.

Another assessment of the debt policy for the provision of state guarantees may be presented by the level of the ratio of the guaranteed debt to the nominal GDP of Ukraine. This indicator also changed dynamically during 2010–2020 (Figure 2).
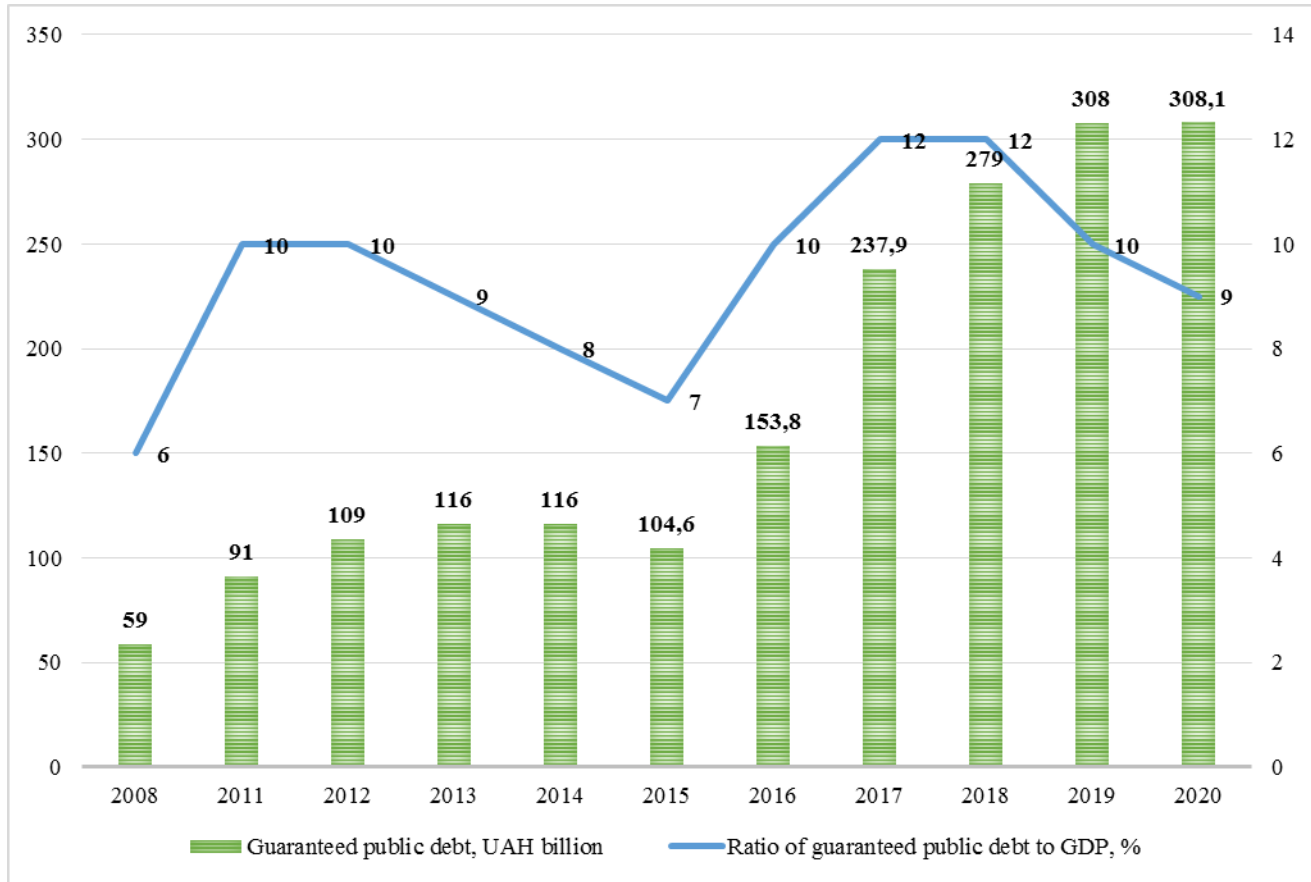
Fig. 2. Dynamics of the state-guaranteed debt of Ukraine during 2010-2020
Source: based on Ukraine Government Debt (2021)

For example, if in 2010 the ratio of the guaranteed debt to GDP was 6.2 %, in 2009 it increased to 10.0 %. Later on, namely in 2012–2016, it did not exceed 10 %. At the same time, in 2017 and 2018 the level of the ratio was 12.0 % and 11.7 %, respectively.   As of the end of 2019, this indicator decreased again to 10.3 % and to 8.7 % in 2020.

Analysis of the dynamics of state guarantees during 2007–2020 is presented in Figure 3 "Dynamics of state guarantees in Ukraine during 2007–2020", and it indicates the growth of this component of the debt burden in 2011 and 2015.
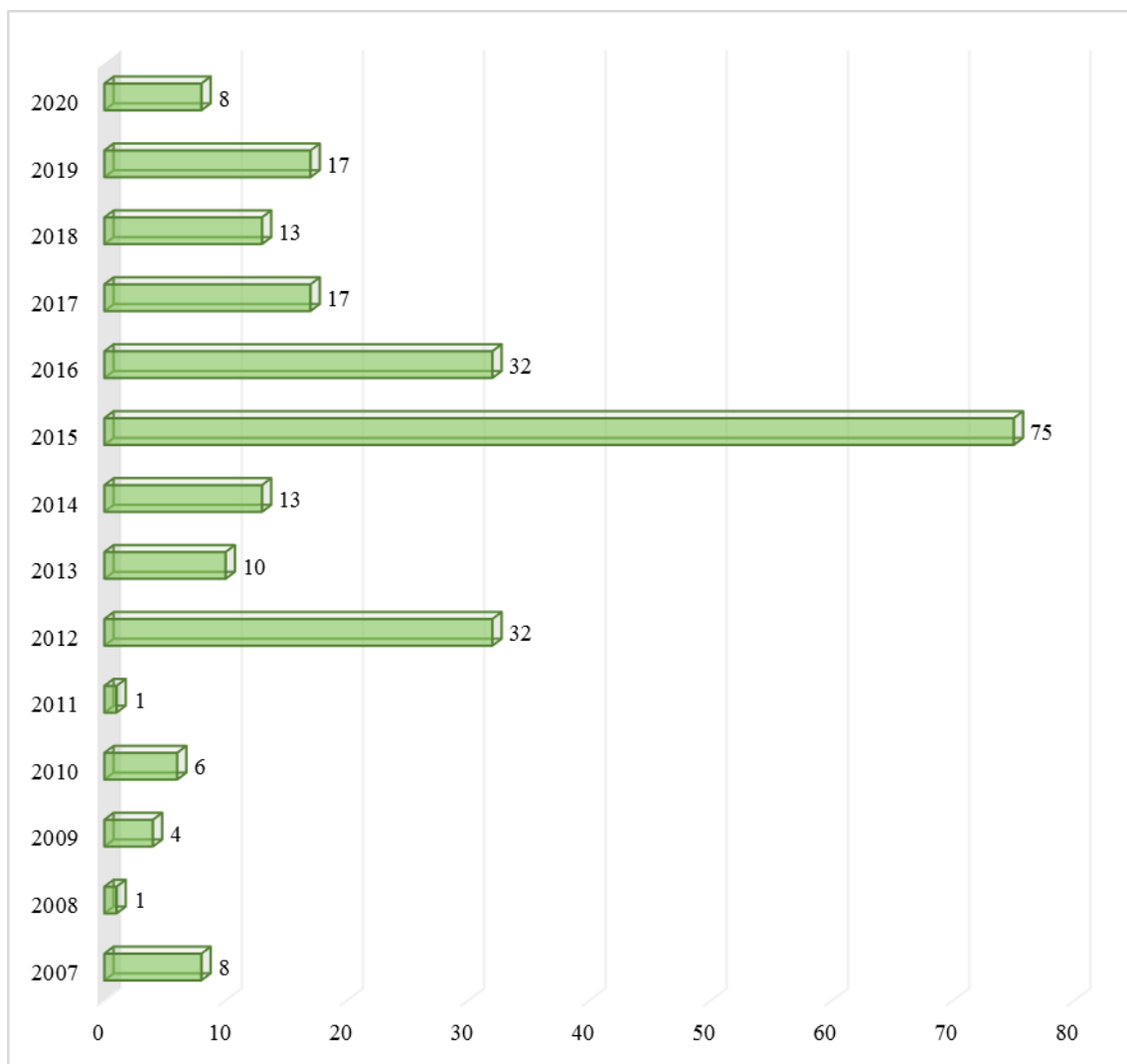
Fig. 3. Dynamics of state guarantees in Ukraine during 2007–2020, UAH billion
Source: based on Ukraine Government Debt (2021)

As shown in Figure 4, during 2010-2016, in most member states of the European Union there was a gradual decrease in the level of the ratio of guaranteed debt to GDP. Thus, in Austria this indicator in 2012 was 38.2%, and in 2016 — 20.5 %. In Belgium, this ratio was characterized by the following indicators: In 2010, — 17.2 %, and in 2016 — 10.9 %. In the United Kingdom the ratio was 27.4 % and 8.3 %, respectively, in Greece — 25.3 % and 6.1 %, respectively. The most noticeable changes have taken place in the debt policy of Ireland. For example, in 2010 the ratio of guaranteed debt to GDP was 96.0 % of GDP, and in 2016 only 1.9 %.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
■ 2016	21	11	1	8	6	10	2	2	8	2	9	2	1	13	14	4	14	7	6	2	0	10	8	28	5	3	0	11
■ 2015	23	10	1	9	28	10	2	5	10	2	15	2	1	11	15	4	15	7	7	2	0	11	8	29	4	2	0	11
■ 2014	26	12	1	0	28	10	2	13	13	3	16	1	1	12	16	4	15	7	7	2	0	12	7	26	5	3	1	10
■ 2013	33	14	1	9	31	10	2	31	19	6	16	2	1	9	16	7	17	7	13	2	0	14	8	24	6	3	1	12
■ 2012	38	18	1	10	31	7	2	66	21	6	14	3	1	9	17	8	17	7	14	2	0	13	9	21	5	3	1	12
■ 2011	35	15	1	15	36	13	2	80	15	4	8	3	1	8	13	10	19	7	12	2	0	17	9	20	6	3	1	14
■ 2010	28	17	1	27	25	15	3	96	13	1	7	3	1	6	12	10	20	5	5	2	0	20	9	20	7	5	1	17

Fig. 4. Ratio of state-guaranteed debt to GDP in EU member states during 2010–2016, %
Source: based on Eurostat: Database. URL: https://ec.europa.eu/eurostat/data/database
Notes: 1 - Austria, 2 - Belgium, 3 - Bulgaria, 4 - United Kingdom, 5 - Greece, 6 - Denmark, 7 - Estonia, 8 - Ireland, 9 - Spain, 10 - Italy, 11 - Cyprus, 12 - Latvia, 13 - Lithuania, 14 - Luxembourg, 15 - Malta, 16 - Netherlands, 17 - Germany, 18 - Poland, 19 - Portugal, 20 - Romania, 21 - Slovakia, 22 - Slovenia, 23 - Hungary, 24 - Finland, 25 - France, 26 - Croatia, 27 - Czech Republic, 28 - Sweden

Significant changes in guaranteed debt indicators of Iceland were due to a gradual reduction in support for the Housing Guarantee Fund, which had a share of about 80% in its structure (Iceland. Selected Issues: IMF Country Report (2005)). The purpose of this fund was to provide cheap credit resources to low-income citizens of Iceland to provide them with housing. In addition to guaranteeing the above housing fund, the government of Iceland provided guarantees to state-owned companies operating in the energy sector on floating rate loans.

At the same time, there were countries in the European Union, which increased the ratio of guaranteed debt to GDP during this period. For example, this applies to Malta — from 11.8 % in 2010 to 14.1 % in 2016, Poland — from 5.3 % to 7.1 %, respectively. The lowest level of the ratio of state-guaranteed debt to GDP at the beginning of 2017 was recorded in Bulgaria — 0.5 %, Estonia — 1.5 %, Latvia — 1.5 %, Lithuania — 0.9 % and the Czech Republic — 0.3 %. At the same time, since 2012, Slovakia has not provided state guarantees at all.

In Finland, the largest amounts of state guarantees were provided through a special guarantee agency "Finnerva". The share of guarantees provided through this institution in the total amount of state guarantees in Finland was about 80 % at the beginning of 2017. In the total amount of state guarantees provided through Finnerva, the main part (about 84 %) was provided to such sectors of the economy as telecommunications, shipbuilding, and forest industry (Overview of Central Government Risks and Liabilities (2016)).

According to the experience of post-Soviet countries, new EU members, the debt burden due to state-guaranteed debt does not exceed 10 % of GDP. Therefore, in Ukraine it is necessary to develop a program to reduce this indicator at least to this value.

There was made an analysis of the provisions of certain regulations relating to risk management in the areas of debt provision of state guarantees. It, in particular, indicates the need to harmonize these instruments. An important result should be the formation of a single and integrated regulatory approach to risk management in the area of state guarantees. It is necessary to amend the Resolution of the Cabinet of Ministers No. 131 dated February 23, 2011. (On approval of the Regulation on risk management related to the provision of state

guarantees and distribution of such risks between the state, creditors and borrowers. With change (2011)), which only partially covers the risks related with the provision of state guarantees. To update the Regulation, it is necessary to include in its provisions the definitions of currency risk, interest rate risk, refinancing risk and budgetary risk. In this case, the issue of state guarantees will cover the full range of risks of government debt, which are scattered in various regulations.

According to the analysis of statistical information on the implementation of budget programs related to the use of state guarantees, there are significant shortcomings in the organization of the expenditure planning process. During 2012–2019, there were cases when the indicators of actual implementation of these programs were only half, and less than the planned volume.

This applies to such budget programs as "Fulfillment of debt obligations on loans obtained under the guarantee of the Cabinet of Ministers of Ukraine for the development of a network of public roads", "Fulfillment of debt obligations on loans attracted under state guarantees for the implementation of Cyclone-4 projects" and "Creation of the national satellite communication system", as well as "Servicing and repayment of liabilities under state guarantees for capital expenditures by budget managers". The results of the implementation of planned indicators of the other programs were slightly better, but only in some cases they were close to 100 %. Thus, the Ministry of Finance of Ukraine, together with other budget managers, has a task to improve the methods of planning of budget programs related to the provision of state guarantees. As a result of these measures, the efficiency of allocation and use of budgetary resources should improve and stimulate the socio-economic growth of the country as a whole.

Ukraine does not yet use the "debt sustainability" approach, the debt risk control system is not risk-oriented, there is no risk ranking (low, medium, high) and accordingly there is no clear understanding of what to focus on first and how to manage public debt risks to further minimize them. The current methodology for determining risks also does not provide for the assessment of changes in risks under the influence of random changes in external and internal factors (no stress testing). Therefore, in Ukraine, when improving approaches, the considerations of international financial organizations, which have proven themselves well in practice, should be taken into account in the first place (Demchuk et. al (2020)).

Table 1 shows the results of forecast calculations for the economy of Ukraine until 2022 according to the IMF methodology for establishing the values of key macroeconomic indicators that affect the change in the ratio of public debt to GDP. The main assumption in the forecast is that the amount of gross public debt relative to GDP after 2018 will gradually decrease. Until 2016–2017, the government debt of Ukraine was accumulated through borrowings received from international financial organizations and other creditors.

Table 1. Some debt, economic and market indicators of the economy of Ukraine according to the IMF methodology, % of GDP

Indicators	Actual data			Forecast data			
	2018	2019	2020	2021	2022	2023	2024
Nominal gross public debt	81.0	71.8	61.4	62.8	57.9	53.8	49.8
incl. state guarantees	12.0	10.2	8.7	9.6	9.3	8.9	8.6
Gross financing needs	11.4	13.2	9.0	8.1	8.3	7.4	6.1
Real GDP growth, %	–3.2	2.5	3.3	3.9	3.1	4.6	4.1
Inflation (GDP deflator), %	24.9	48.7	9.8	7.1	7.0	6.3	5.5
Nominal GDP growth, %	0.0	14.3	19.3	8.7	8.8	7.1	7.3
Effective interest rate, %	10.7	8.0	2.0	2.9	2.4	2.2	2.2

Source: author's calculations according to Debt Sustainability Analysis (2020)

Assumptions about trends of changes in nominal GDP, in turn, suggest its growth at a moderate rate. Thus, during 2021–2024, it will fluctuate in the range of 8.7 %–7.3 %. The increase in real GDP for the same period will range from 3.9 % to 4.1 %. This is one of the reasons why the ratio of public debt as a whole to GDP will decrease in the forecast period, to 49.8 % in 2024. Debt management problems that may arise when reaching this mark in the ratio are currency and credit risks that lead to changes in public debt, in particular in foreign currency, as currently IFOs are the main creditors of Ukraine.

This affects the dynamics of public debt as follows:
- real GDP growth reduces the level of debt burden;
- growth of gross financing needs determines the growth of future borrowings;
- growth of inflation leads to increased expenditures on public debt service.

In the course of debt management, it is necessary to form a systematic approach to synchronized management of public and state-guaranteed debt in Ukraine (in the EU it is already applied). This will allow to gradually reduce the debt burden on the economy of Ukraine to an optimal level.

5. Discussion

Thus, state guarantees are an important tool for financing public expenditures, which is actively used by the Government of Ukraine. A characteristic feature of this process, which reduces the effectiveness of state guarantees, is the lack of medium-term and long-term strategic priorities. There was no thorough assessment of the effectiveness of the use of loans and borrowings obtained under state guarantees in the framework of certain projects. Therefore, the formation of management decisions on state guarantees requires an updated approach, which will allow to obtain detailed information on the feasibility of providing such guarantees and evaluate the results of using this tool.

The provision of state guarantees is a debt-generating factor, this process should be constantly monitored by relevant government agencies and, above all, the Ministry of Finance of Ukraine. Such control should be exercised on a systematic basis in conjunction with public debt management decisions. Under such conditions, there appears a need to improve the procedure for developing a medium-term public debt management strategy by including in it the issues related to state-guaranteed debt. This is in line with the provisions of the Budget Code of Ukraine and, subject to implementation, will allow comprehensive control of the range of issues of debt policy of our state. The updated procedure for strategy development should also take into account the need to involve the National Bank of Ukraine in this process, which does not yet have such an opportunity.

The shortcomings of the functioning of the area of state-guaranteed debt identified during the study indicate the need to improve regulatory mechanisms, which will allow to improve the processes of selection of projects financed by loans secured by state guarantees, increase the responsibility for preparing the necessary calculations and reporting on project implementation. As a result, this will allow to significantly reduce state budget expenditures and increase the efficiency of support for important socio-economic tasks of state policy.

To reduce the risks of implementation of measures to improve the management of public and state-guaranteed debt of Ukraine, it is necessary to bridge the gaps in the legislative field, which are manifested in the comparison of Ukrainian and European legislation.

In accordance with the legislation of the EU member states, the formation of the government borrowing program is based on medium-term economic and fiscal forecasts (Shahor (2018)). Assessment of the EU experience shows the important role of the system of analytical calculations in the process of formation and implementation of public debt management strategy. The main issues of such a strategy are reducing the state budget deficit, reducing the share of debt instruments denominated in foreign currency, increasing the share of long-term debt instruments, etc.

The practice of public debt management of EU member states demonstrates the important role of planning and forecasting, which should cover the entire sector of public administration (Chen et. al (2017)). The formation of macroeconomic forecasts should be carried out in different scenarios. When developing a system of medium-term planning and forecasting in EU member states, it is taken into account that the budget process goes far beyond the preparation and implementation of the budget within one year. Therefore, budget plans and programs related to government borrowing are drawn up in accordance with the medium-term budget forecast (Arai et. al (2018)).

In turn, the medium-term budget forecast should include information on forecast budget and key economic indicators, description and assessment of possible policy measures aimed at achieving the desired goals, assessment of the impact of changes in key economic indicators on the budget and public debt, information on medium-term monetary objectives and their relationship with exchange rate stability.

Conclusions

The experience of the use of state guarantees by the governments of the member states of the European Union has been assessed. It can be noted that during 2010–2016 in most member states of the European Union there was a gradual decrease in the level of the ratio of guaranteed debt to GDP. Examples of this trend are the financial policies of Austria, Belgium, the United Kingdom, Greece and other EU countries. According to the experience of post-Soviet countries, new EU members, the debt burden due to state-guaranteed debt does not exceed 10 % of GDP. Therefore, in Ukraine it is necessary to develop a program to reduce this indicator at least to this value.

It is determined that the main direction of improving the management of public and state-guaranteed debt is to create a systematic approach to the formation of management decisions by the relevant public authorities, which takes into account the best practical experience of European Union member states. This approach should include ongoing monitoring of the full range of debt transactions and, in the event of significant changes, analysis of the factors that led to deviations from the planned indicators and taking corrective actions to achieve the objectives of the debt policy.

Such changes should be reflected in the policy documents of the Ministry of Finance on public and state-guaranteed debt management in the medium term. This principle will make it possible to optimize the expenditures of the state budget taking into account the changes taking place in the monetary area and in the area of foreign economic relations. In order to improve the situation, the Ministry of Finance of Ukraine, together with other budget managers, needs to improve the methods of planning of budget programs related to the provision of state guarantees.

The assessment of the experience in the use of state guarantees by the governments of the member states of the European Union allows to note that during 2010–2016 in most member states of the European Union there was a gradual decrease in the level of the ratio of guaranteed debt to GDP. Examples of this trend are the financial policies of Austria, Belgium, the United Kingdom, Greece and other EU countries. The level of debt burden of the new EU member states at the expense of guaranteed debt does not exceed 10 % of GDP. Ukraine should focus on these countries.

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Dmytro ZHURAVLOV, Doctor of Juridical Sciences, Professor, Deputy Head of the Department for Citizenship, Pardons, State Awards - Head of the Pardons Department of the Office of the President of Ukraine
ORCID ID: orcid.org/0000-0002-2045-9631

Mykhailo PROKHORENKO, Candidate of Juridical Sciences, Head of the Department of Legal Support National defence university of Ukraine namod aflor Ivan Gherniakhovskyi
ORCID ID: orcid.org/0000-0002-1471-9134

Tamara CHERNADCHUK, Assistant Professor Chair of Administrative and Information Law, Law Faculty Sumy National Agrarian University
ORCID ID: orcid.org/0000-0002-6758-7438

Vitaliy OMELYANENKO, PhD (Econ), Associate Professor, Institute of Industrial Economics of National Academy of Sciences of Ukraine
ORCID ID: orcid.org/0000-0003-0713-1444

Valentyna SHEVCHENKO, Candidat of Science (Public Administration), Associate Professor, Alfred Nobel University
ORCID ID: orcid.org/0000-0003-0614-0648

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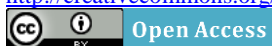
LEGITIMIZATION OF INCOME OF CLIENTS AS A FACTOR OF FINANCIAL STABILITY OF BANKS

Stanislav Zlyvko [1]*, Serhii Shkliar [2], Anatoliy Kovalenko [3], Maksym Sykal [4], Oleksandr Snigerov [5]

[1,3] Academy of the State Penitentiary Service, Honcha str. 34, Chernihiv, 14000, Ukraine
[2] Arzinger Law Firm, Moskovskaya Street, 32/2, Kyiv, 01010, Ukraine
[4] Private Institution of Higher Education, Kyiv International University, vulytsia Lvivska, 49, Kyiv, 03179, Ukraine
[5] Principal Researcher at the Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations of the Ministry of Justice of Ukraine 8a, Zolochivska Str., Kharkiv, 61177, Ukraine

E-mails:[1]* zlyvko@ukr.net

Abstract. Prevention and counteraction to money laundering by bank clients are the most important links in the fight against money laundering among all entities of primary financial monitoring: reports of banks on suspicious financial transactions account for 96–98 % of the total number of reports to the State Financial Monitoring Service of Ukraine. An important step in further development and improvement of the system of prevention and counteraction to money laundering of the banks clients is its evaluation and identification of weaknesses. Cash transactions and cash flows through the accounts of bank clients are the most risky group of services of banking institutions in terms of money laundering. The analysis of statistical characteristics of the series of dynamics of cash turnover, turnover of funds on accounts at the request of economic entities, turnover of funds on accounts at the request of individuals of 96 banks of Ukraine showed that banks in which activity the National Bank of Ukraine (NBU) detect fraudulent operation with signs of money laundering, have significantly higher values of the coefficient of variation of cash flows, on average 46 %, compared to banks in which the NBU did not detect fraudulent operations, but did detect violations, for which it applied measures of influence, and in comparison with banks to which no measures of influence were applied. The results of the analysis proved that the coefficient of variation can be used as an indicator of the level of risk of money laundering by the bank clients, which allows to significantly facilitate and reduce the duration of analysis of bank financial performance within rapid testing for money laundering.

Keywords: money laundering; shadow economy; business activity; stability; risk

1. Introduction

Legitimization of incomes from crime is a significant threat to the stability of the economy of any country, it significantly reduces the financial security of the state and increases the risk of global socio-economic and political instability. Awareness of this threat encourages the international community to develop and implement appropriate measures to limit and prevent money laundering. However, the rapid development of information technology, increasing the mobility of financial resources, virtualization of certain types of business activities require constant improvement of processes and tools to prevent and combat money laundering.

Leading professionals, specialists and experts on money laundering are aware that most counteraction mechanisms are developed ex post facto, i.e. after the identification and definition of typological schemes and methods of money laundering, and often after a series of specially conducted investigations and relevant court decisions (Jaara & Kadomi 2017; Kriviņš et. al 2021). In this regard, it is almost impossible to talk about the existence of effective and well-functioning preventive or precautionary measures: when the general public becomes aware of an improved or new scheme or method of money laundering, criminals find new ways to withdraw funds from the shadow economy (Habibzadeh 2016). The process of combating money laundering is complicated by the fact that the schemes of money laundering, as a rule, have a significant number of participants subordinated to various departments, ministries, and often states (Chong & Lopez-De-Silanes 2015). Therefore, the state system of financial monitoring, which is designed to combat money laundering, coordinate the activities of various entities, includes in its structure public authorities of various branches and a wide range of primary level entities.

One of the leading roles among the entities of primary financial monitoring belongs to banking institutions, which carry out the vast majority of cash transactions within Ukraine and provide 96 % or more of information on suspicious financial transactions. Only in 2017–2018, there was detected legitimization of UAH 33.26 billion using banking services. For these reasons, the issue of preventing and counteracting the legitimization of income of bank clients is always relevant, and for the proper implementation of the functions of internal financial monitoring it is necessary to create effective systems to prevent and combat legitimization of income.

The issue of preventing and combating legitimization (laundering) of proceeds from crime is among the key ones in the context of ensuring economic security of both Ukraine and the world. The rapid development of information technology, in particular in the field of financial technology, has contributed to the complexity of criminal schemes and the emergence of new tools for money laundering. In the process of European integration, Ukraine has undertaken a number of commitments to combat money laundering.

However, the process of development of the legal framework, as well as methodical support for combating money laundering in Ukraine is not yet complete. In view of this, it is important to develop and improve the theoretical basis for preventing and combating legitimization (laundering) of proceeds from crime.

2. Literature review

Despite the significant results of scientific studies in the field of prevention and counteraction to legitimization (laundering) of proceeds from crime, the issues of combating money laundering remain insufficiently developed, taking into account the specifics of banking institutions. For example, the Regulation on Implementing the Financial Monitoring by Banks (2015) adopted to prevent the use of the banking system for legitimization (laundering) of proceeds from crime, terrorist financing and the financing of the proliferation of weapons of mass destruction has no definition of the concept of legitimization of criminal proceeds/terrorist financing by a bank client. There is no definition of the concept of legitimization of income in the main law — the Law of Ukraine "On Prevention and Counteraction to Legalization (Laundering) of Proceeds from Crime, Financing of Terrorism

and Financing of Proliferation of Weapons of Mass Destruction" (2014), although it is the main concept appears in the text of the law almost 200 times, which is on average 3–4 times per page.

In this regard, the question arises about the quality and effectiveness of the measures developed to prevent and combat legitimization, because if there is no definition of the basic concept, then what exactly are the appropriate measures aimed at, what is the core of the financial monitoring system, what is the fight led with (Sobreira et. al 2019).

Based on the analysis carried out by the authors, we can identify the main morphological components of the concept of "legitimization of income": it is defined as a process or set of actions, methods, techniques, financial transactions, agreements, etc. (Dreżewski et. al 2015); it occurs after the commission of the "main" (predicate) crime (Teichmann 2020); it aims to hide the sources of funds for their further use in the process of legitimate economic activity (Tsingou 2018).

It should be noted that the presence of a predicate crime is the basis for the recognition of income as illegal and for the definition of the related financial transactions as legitimization (laundering) of income.

A separate issue in determining the content of the concept of legitimization of income is to establish its relationship with the main (predicate) crime, i.e. socially dangerous, illegal actions, as a result of which there appears a criminal income, which is then subject to legitimization. Summing up the views of the authors (Isa et. al 2015; Singh & Best 2019), we can say that there are two main provisions regarding this issue. The first provision is that money laundering should be considered as a separate crime committed using a two-, three-, four-phase scheme.

However, at each stage of these schemes there is no connection with the predicate crime, which determines the method and mechanism of money laundering. Such approach assumes that money laundering is a separate crime in relation to the primary crime of obtaining it, and therefore an indication of the "criminal nature" of the origin of such money (income) must be contained directly in the concept — "legitimization of proceeds of crime".

The second provision on the relationship between money laundering and the main predicate crime involves the introduction of the so-called "zero phase" into the money laundering schemes, which is associated with the commission of a predicate crime. Such approach is used by the SCFM of Ukraine (Current methods and ways of legitimization (laundering) of proceeds from crime and terrorist financing, 2014). Under such conditions, it is clear by default that only criminal proceeds will be legitimized. It is such approach to understanding the essence of the concept of "legitimization of income" that is the basis of the study presented in the dissertation.

That is, in summary, we can say that the legitimization of income of bank clients already implies the fact that the crime was committed, and refers only to the incomes of bank clients, which were obtained by criminal way.
An important aspect of further development of the system of prevention and counteraction to legitimization of income of bank clients is substantiation of definitions of concepts of "prevention of legitimization of income of bank clients" and "counteraction to legitimization of income of bank clients", as it is quite logical to assume that the above system consists of two main subsystems — a subsystem to prevent legitimization of income and a subsystem to counteract to legitimization of income.

3. Research Methodology and Data

The theoretical and methodological basis of the study are the fundamental theses of economic theory, finance theory, systems theory, research results of domestic and foreign scientists on combating money laundering, preventing and counteracting to legitimization of illegal income, financial monitoring systems, as well as general and special methods of cognition of the processes of identification, development and evaluation of processes and systems related to anti-money laundering. In particular, methods of statistical and coefficient analysis were used to solve the tasks set in the work — to determine the status and dynamics of macroeconomic factors in the legitimization of criminal income of bank clients.

One of the hypotheses of the study is that the level of risk of using the banking services to legitimize the income of its clients and the level of development of the system of prevention and counteraction to legitimization are interrelated and have an inverse relationship, i.e. the higher the level of development of the system of legitimization of income, the lower the risk of using the services of the bank for legitimization of income.

The sample of banks for in-depth analysis of cash transactions as priority ones in terms of minimizing the risk of legitimization of income of clients includes 16 banks or 20.78 % of the total number of operating banks, which is a representative sample from a statistical point of view. The National Bank of Ukraine has started to provide extended data on withdrawal and crediting of funds to various accounts of Ukrainian banks (Balance sheet of the bank in accordance with Annex 1 to the Resolution of the Board of the National Bank of Ukraine "On publication of certain information on activity of banks of Ukraine" in accordance with data of statistical reporting by form № 10 (file 02) and data submitted to the National Bank of Ukraine in accordance with the Procedure for preparation, submission and publication of financial statements by banks of the Board of the National Bank of Ukraine (2017)) from August 2017, so the amount of data available for analysis as of May 2019 is 20 periods (monthly data).

The standardized measure of risk is the coefficient of variation of a random variable. According to the statistics (Sciurba 2018), it is more than 0.25 (Lee 2019). In addition, a certain predictability of the turnover of funds, and, accordingly, the controllability of this process, can be determined by the compliance of distribution of the time series with the normal one. It is believed that the normal distribution indicates that the random variable depends on the systematic action of certain factors that can be detected and evaluated, and statistical procedures are the most developed for the normal distribution of a random variable. To check the compliance of data on cash turnover and funds on current accounts of clients with the normal law, the coefficients of excess, asymmetry and the value of the Shapiro-Wilk test were analyzed, which was chosen due to the fact that the sample size for each indicator does not exceed 20.

Calculations and economic-mathematical modeling were carried out using Microsoft Excel 2016 and Statistica 10.0 software product.

The information base of the study consisted of the documents of the group for the development of financial measures to counteract money laundering (hereinafter FATF), legal and regulatory acts of Ukraine, data of the State Financial Monitoring Service of Ukraine, the State Statistics Service of Ukraine, the National Bank of Ukraine, the Ministry of Finance of Ukraine, materials from the official websites of banks, materials of professional financial associations.

The purpose of the work is the further development of theoretical principles, development of methodical support and practical recommendations for the development of a system to prevent and counteract to legitimization of income of bank clients. Achieving the purpose of the study involves solving such tasks: to analyze the financial activities of Ukrainian banks to identify the risk of money laundering; to form methodical support for risk

assessment of the use of banking services for money laundering; to provide practical recommendations for improving the existing bank systems to prevent and counteract money laundering.

4. Results

Building a system of prevention and counteraction to legitimization of income of bank clients is an urgent task of development of the system of financial monitoring of Ukraine. For its effective implementation, it is necessary, firstly, to assess the actual state and activities of banks concerning prevention and counteraction to legitimization, secondly, to analyze the experience of other countries in this field and identify its advantages, which can be used and applied in Ukraine, thirdly, to sum up regulatory requirements and restrictions, both international and local, for their further consideration, fourthly, using a systematic approach, to determine whether the appropriate systems are created in Ukrainian banks, and finally, to improve existing systems of prevention and counteraction to legitimization of suspicious income in banks, or create new ones based on the results of the above tasks.

Therefore, the creation of a system of prevention and counteraction to legitimization of income of bank clients should be preceded by large-scale analytical and evaluation activities, the results of which create an appropriate information basis. In this context, the issue and tasks of assessing the system of prevention and counteraction to legitimization of income of bank clients in the past and current periods become urgent. This task can be performed provided that there are appropriate guidelines and effective tools, which exist only in fragments, which necessitated the creation of a integrated, scientifically sound methical approach to assessing the system of prevention and counteraction to legitimization of income of bank clients.

The main difference between prevention and counteraction to to legitimization of income is that counteraction occurs only when there is an action aimed at money laundering. Thus, it is advisable to consider the prevention of the legitimization of income of bank clients as a set of previously taken actions of a bank to prevent an individual or a legal entity from taking any actions with money and other financial assets obtained as a result of illegal and related activities in order to hide their origin and turn them into legal assets through the use or attempt to use the services of a bank.

Counteraction to the legitimization of income of bank clients is a set of actions of a bank that directly prevent an individual or a legal entity from taking any actions with money and other financial assets obtained as a result of illegal and related activities, in order to hide their origin and turn them into legal assets through the use or attempt to use the services of a bank.

The above definitions allow to establish such differences of prevention from counteraction to legitimization of income of bank clients: prevention involves a pre-built system of actions, measures, the operation of which is aimed at prevention of legitimization, while counteraction is carried out at the time of clients attempting to legitimize their income, although it can and should be based on a pre-built system of actions and measures; prevention is preventive in nature, while counteraction has the nature of an action that stops or prevents the other actions.

The banking system of Ukraine is attractive for criminals to carry out money laundering operations, while the financial monitoring services of banks were insufficiently efficient until 2018. This is confirmed by statistics on reports of suspicious financial transactions (Figure 1).
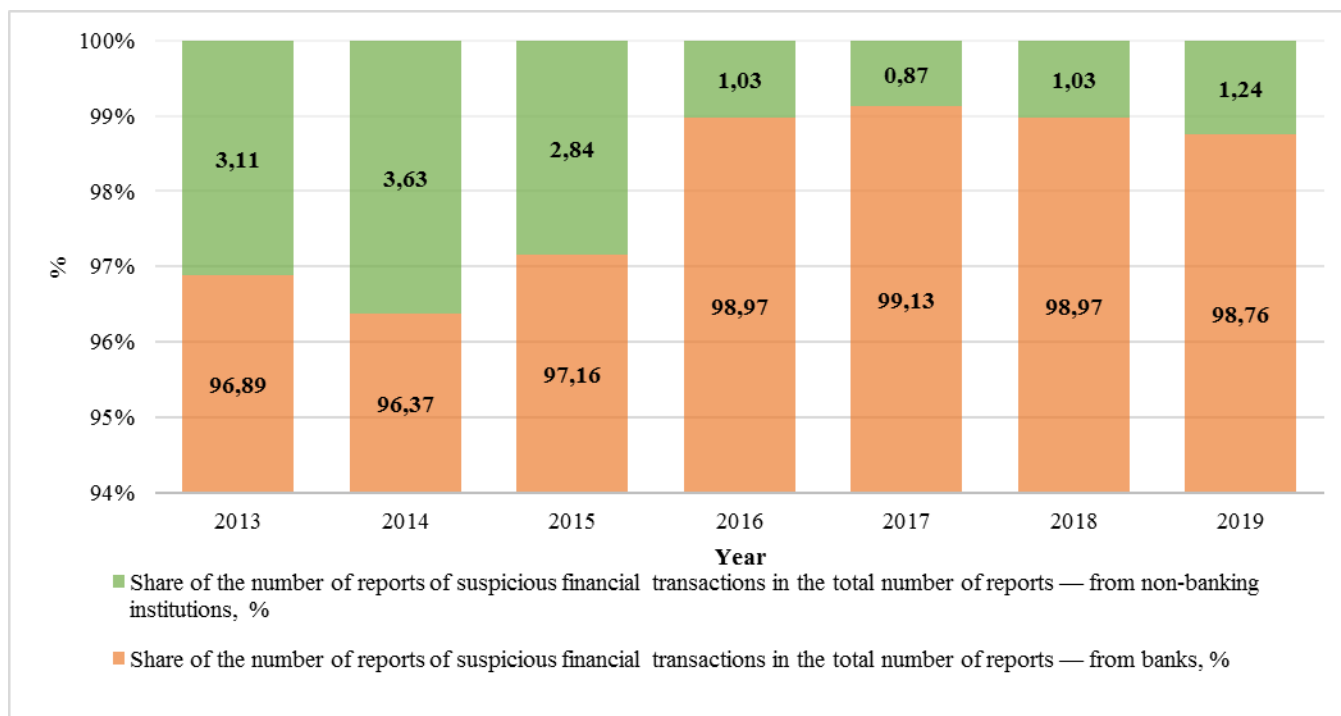
Fig. 1. Dynamics of the number of reports on financial transactions to the SCFM by types of entities of primary financial monitoring for the period of 2013–2019

Source: authors' calculations according to "Six financial institutions voluntarily renounced licenses" (2021)

The data in Figure 1 shows that of all the reports of suspicious financial transactions sent, 96–99 % are just from banking institutions ("Six financial institutions voluntarily renounced licenses" 2021). The generalization of information from these reports is the basis for the formation by the State Financial Monitoring Service of materials for further referral to various law enforcement agencies, including investigative bodies, prosecution agencies, the National Anti-Corruption Bureau. Based on the data in Figure 1, it can be argued that among all the entities of primary financial monitoring, banks create 96 % or more of the information field for prevention and counteraction to legitimization of proceeds of crime. Thus, an important task of further improvement of the system of prevention and counteraction to legitimization of proceeds of crime at the state level is the formation of an appropriate system at the bank level.

The group of economic factors includes: the level of official income of the population, the existence and volume of unofficial income or the level of the shadow economy. Thus, the level of official income of the population is a disincentive to money laundering: the higher the official income, the lower the volume (intentions) of money laundering. The existence and volumes of unofficial incomes of the population, criminal incomes of criminal groups. This factor is a stimulant of money laundering: the higher the level of the shadow economy of a country, the higher the risks of money laundering.

From the point of view of measuring and evaluating the factors of a country at the international level, it is advisable to resort to a comparative approach and use international official ratings, which are formed by recognized international organizations, unions, associations or groups of scientists. Thus, if we use the data (the level of the shadow economy in Ukraine was 47 % of GDP in 2018, according to a study of 2019) on the level of the shadow economy of separate countries in 2018 and compare it with the data on Ukraine, it becomes clear that the level of the shadow economy is much higher in Ukraine. It is 6.3, 5.7, and 1.6 times higher than that of the shadow economy of the USA, Switzerland and Greece, respectively (Figure 2).
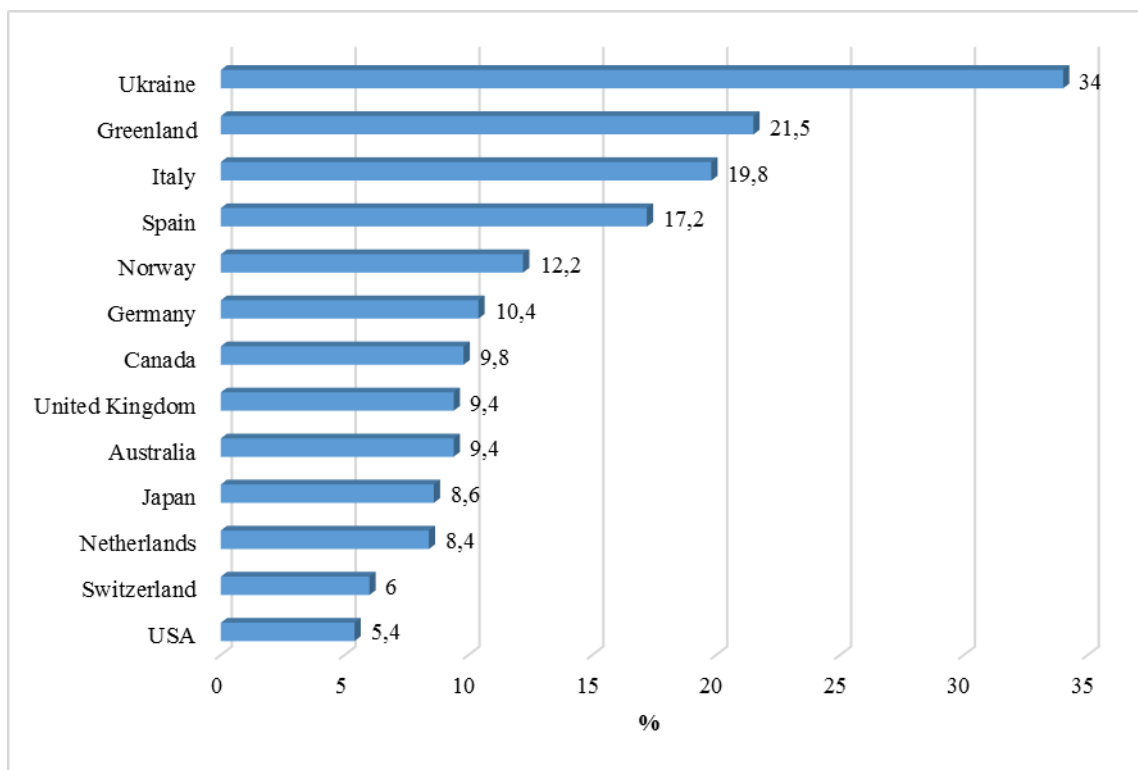
Fig. 2. Level of shadow economy of separate world countries in 2019
Source: built by the authors according to the data (the level of the shadow economy in Ukraine was 47 % of GDP in 2018, according to a study of 2019)

It should be noted that for 10 years (from 2008 to 2018) the leading countries of the world have made significant efforts to combat money laundering, which has had a positive impact on the level of the shadow economy. In Canada, Germany, Switzerland, the USA and New Zealand, the shadow economy declined by more than 22 % from 2007 to 2017. Australia, Austria, Ireland, Norway and Finland have reduced the shadow economy by almost 20 % of GDP: 19.7 %; 19.1 %; 18.1 %; 20.8 %; 20.7 % respectively.

It should be noted that the group of factors of legitimization of proceeds of crime, which is specified in the documents, is a set of factors directly related to the operations of banks and the financial instruments used. Special attention needs to be paid to anonymous operations (prohibited by law in Ukraine); cash transactions and electronic bank transfers, as well as transactions with cryptocurrencies, as they combine signs of anonymity, uncontrollability, high speed of movement of valuables.

Indicators that may reflect the presence and significance of the impact of food factors on anti-money laundering processes may be: the volumes of money supply in cash; the share of cash money supply in GDP; the share of cash in the total money of the country; the volumes of cash banking transactions; the share of cash banking transactions in the total volume of transactions; balances of funds in cryptocurrency wallets declared by individuals. In Figure 3, the analysis of the dynamics of cash turnover in Ukraine for 2009–2019 is presented.
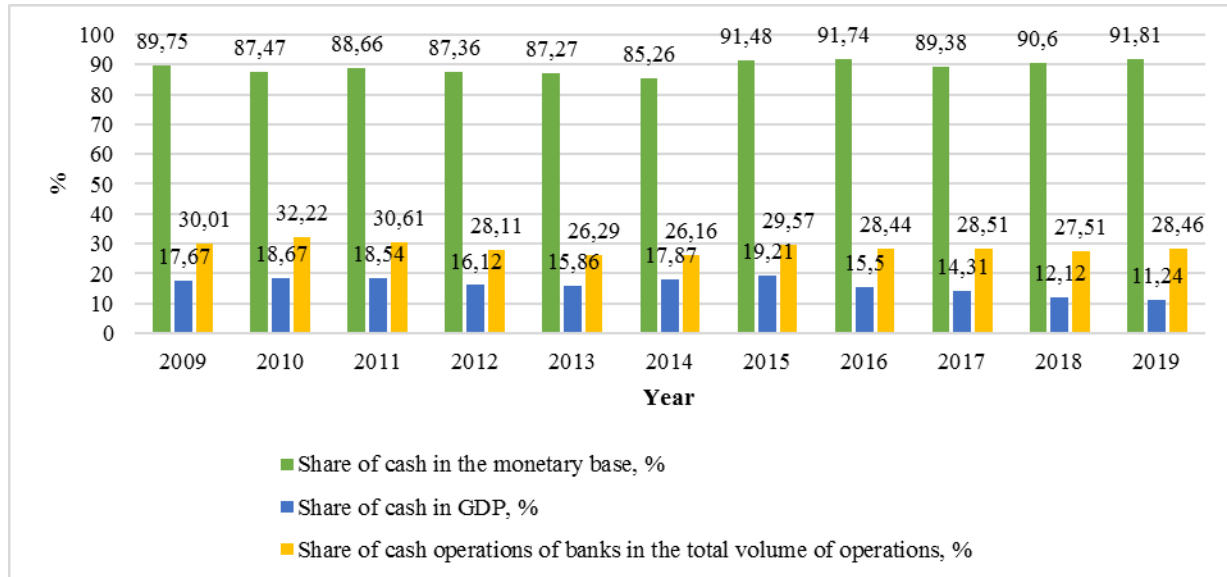
Fig. 3. Dynamics of cash turnover in Ukraine for 2009–2019
Source: calculated by the authors according to the data (Rating of reliable banks of Ukraine 2021)

The data presented in Figure 3 show that in Ukraine the amount of cash in circulation for 2009–2019 exceeds 84 %, which is a very high figure compared to leading European countries. For 2018–2019, the share of cash in the monetary base increased to 92 %. As of the beginning of 2015, one sixth of GDP was in cash, and in 2019 the share of cash in GDP decreased to 11.24 %. One third of banking operations are carried out with cash or in cash, and the situation has not changed over the last ten years, which can contribute to both the shadowing of the economy and the process of money laundering. Regarding the volume of cash transactions outside the banking system and the so-called illegal cash, according to Acting Chairman of the NBU as of July 2017, its volume reached UAH 300 billion, which is 87 % of the total amount of cash issued (Rating of reliable banks of Ukraine 2021).

In order to assess the risk of legitimization of proceeds of crime using the banking services, in particular cash transactions, the volumes of crediting and withdrawing cash, as well as the volumes of transactions on demand accounts (meaning demand accounts of individuals and demand accounts of business entities) in the banks of Ukraine, which had significant shortcomings at the time of the NBU inspection, were analyzed. During 2015–2019, the most vulnerable components of the system of prevention and counteraction to legitimization of income of clients of Ukrainian banks were: analysis, detection, registration of financial transactions subject to financial monitoring; identification, verification and study of clients; risk management. Totally, there were 96 banks with shortcomings in their activities aimed at preventing and combating money laundering in 2016–2019. Some banks have been inspected for several years in a row, and some banks were liquidated. Therefore, for a set of justifications for banks, the operations of which should be analyzed in depth, it is advisable to identify those that had the most significant shortcomings or signs of money laundering.

The analysis of the obtained statistical characteristics of time series concerning volumes of deposit and withdrawal of cash and non-cash means from accounts of clients of bank allows to reveal the increased risk of legitimization of incomes. As an example, we show the statistical indicators of PJSC JSCB "CONCORD" (Table 1).

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Table 1. Statistical characteristics of a time series of cash turnover and funds on accounts at the request of PJSC "JSCB" CONCORD from 01.09.2017 to 01.04.2019

Indicator	Cash				Company demand funds	
	Deposit into an account		Withdrawal from an account		Credit of funds	
	NC	FC	NC	FC	NC	FC
Average value	386,271	133,077	382,655	128,806	1,843,766	449,892
Median value	357,635	96,336	356,903	94,313	1,728,895	343,768
Minimum value	245,716.5	20,529.0	255,489.0	21,681.3	955,925.1	237,911.7
Maximum value	743,074	485,005	677,605	428,716	2,967,277	1,276,587
Standard deviation	123,292.0	125,477.2	110,547.1	117,684.9	624,436.6	257,171.8
Variation coefficient	0.3192	0.9429	0.2889	0.9137	0.3387	0.5716
Asymmetry ratio	2.08	1.70	1.94	1.50	0.39	1.98
Standard asymmetry error	0.51	0.51	0.51	0.51	0.51	0.51
Excess coefficient	4.35	2.48	3.76	1.50	−1.16	4.70
Standard excess error	0.99	0.99	0.99	0.99	0.99	0.99
Shapiro-Wilk test	0.74995	0.79438	0.76486	0.80685	0.93057	0.78332
P-value of Shapiro-Wilk test	0.00017	0.00071	0.00027	0.0011	0.15835	0.00049
Indicator	Demand funds of companies		Demand funds of individuals			
	Withdrawal of funds		Withdrawal of funds		Credit of funds	
	NC	FC	NC	FC	NC	FC
Average value	1,849,656	451,068	136,572	55,410	138,458	58,249
Median value	1,709,254	345,769	128,810	43,129	129,269	47,689
Minimum value	978,754.6	220,542.9	68,190.2	7,051.1	67,401.2	8,037.5
Maximum value	2,934,153	1,287,751	242,675	169,643	242,746	185,532
Standard deviation	622,486.7	257,164.0	47,929.4	41,669.2	48,603.7	45,571.5
Variation coefficient	0.3365	0.5701	0.3509	0.7520	0.3510	0.7824
Asymmetry ratio	0.41	2.05	0.47	1.44	0.41	1.66
Standard asymmetry error	0.51	0.51	0.51	0.51	0.51	0.51
Excess coefficient	−1.17	5.08	−0.25	1.97	−0.20	2.69
Standard excess error	0.99	0.99	0.99	0.99	0.99	0.99
Shapiro-Wilk test	0.92551	0.78482	0.96059	0.86482	0.96072	0.8294
P-value of Shapiro-Wilk test	0.12654	0.00052	0.55573	0.00954	0.55831	0.00245

Source: authors' calculations based on ("Six financial institutions voluntarily renounced licenses" 2021)
Notes: NC — national currency of Ukraine, FC — foreign currency

The data presented in Table 1 show that there is a high risk of money laundering by clients of PJSC "JSCB "Concord", as the value of the covariance coefficient for the entire analyzed period for all indicators was not less than 0.28, and for the accounts of individuals in foreign currency the variation more than 0.75. The asymmetry for all values is positive, which indicates the location of most of the data to the right of the mathematical expectation. In statistics, it is believed (Wetzel & Luciano 2017) that "events for which excess is maximum are burdened with minimum risk".

For PJSC "JSCB "Concord" (Table 2), this means that the lowest risk of money laundering is associated with operations related to withdrawal (or write-off) and crediting funds in foreign currency to the accounts of economic

entities. To compare the calculated values of the Shapiro-Wilk test with the table ones, the corresponding calculations were carried out, the results of which are presented in Table 2.

Table 2. Value of the Shapiro-Wilk test for 20 observations

Indicator	Significance level		
	0.01	0.05	0.1
Shapiro-Wilk test for 20 observations	0.2167	0.4230	0.5422

Source: authors' calculations based on ("Six financial institutions voluntarily renounced licenses" 2021)

If the calculated value of the test is greater than the table ones (Table 2), it is assumed that the analyzed value is distributed normally. Therefore, according to the Shapiro-Wilk test, the values of cash and non-cash funds of clients of PJSC "JSCB "Concord" are normally distributed, which allows to apply parametric methods of analysis for the bank data. To check the closeness of the relationship between the crediting and withdrawal of funds from accounts, the coefficient of pair correlation between the amounts of crediting funds to the respective accounts and the amounts of withdrawals from the accounts of clients of PJSC "JSCB "Concord" was used, and the results of calculations carried out by the author are presented in Table 3.

Table 3. Coefficients of pair correlation between indicators of cash and non-cash flows of clients of PJSC "JSCB "Concord"

Indicator	Cash deposits	Cash withdrawals	Deposit of funds into demand accounts of a company	Withdrawal of funds from demand accounts of a company	Deposit of funds into demand accounts of individuals	Withdrawal of funds from demand accounts of individuals
Cash deposits	1.0000	0.9940	0.5756	0.5769	0.7983	0.8368
Cash withdrawals	0.9940	1.0000	0.5910	0.5944	0.7887	0.8278
Deposit of funds into demand accounts of a	0.5756	0.5910	1.0000	0.9980	0.4793	0.4881
Withdrawal of funds from demand accounts of	0.5769	0.5944	0.9980	1.0000	0.4823	0.4922
Deposit of funds into demand accounts of individuals	0.7983	0.7887	0.4793	0.4823	1.0000	0.9900
Withdrawal of funds from demand accounts of individuals	0.8368	0.8278	0.4881	0.4922	0.9900	1.0000

Source: authors' calculations based on ("Six financial institutions voluntarily renounced licenses" 2021)

The data presented in Table 3 show that crediting and withdrawing funds are closely related, as the coefficients of pair correlation between the indicators of one group are 0.99 and more. Also, the data presented in Table 3 allow to see that in PJSC "JSCB "Concord" cash flow is more closely related to the accounts of individuals than the flow of funds of enterprises and organizations.

The authors' calculations of statistical characteristics of the time series of cash turnover and turnover of funds on the accounts of bank clients — business entities and individuals showed that banks, in the activities of which scheme operations are detected, have mostly high values of the coefficient of variation (on average 25 %).

The conducted analysis showed that the coefficient of variation of the flow of funds in the accounts of bank clients and cash flow can be used as an indicator of the risk of money laundering.

5. Discussion

Ukraine belongs to the group of countries with an increased risk of money laundering and terrorist financing: It is characterized by a high level of shadow economy, a very high percentage of cash in circulation and cash transactions of banks, low incomes, a significant number and participation of officials in economic processes. The main recommendations that should be implemented in Ukraine to reduce the risk of money laundering, terrorist financing and/or financing the proliferation of weapons of mass destruction (AM/FT) are: a ban on transactions with countries and residents of countries with the highest values (more than 7.5 out of a maximum of 10) of the Basel Anti-Money Laundering Index; high fines for banks in case of detection of transactions with clients, which on certain grounds should be classified as high-risk in terms of legitimization of income, formalize in legislation the application of the measure of revocation of bank licenses in case of systematic violation of current legislation on financial monitoring.

The approach to assessing the risk of money laundering is based on a risk score and has 15 indicators that take into account certain aspects of suspicious financial transactions and personnel involvement in money laundering and does not take into account such important components as internal control, internal and external audit, compliance, personnel competence, corporate governance, information systems management, which also significantly affect the level of risk of the bank regarding money laundering (Kostyuchenko et. al 2018).

In the evaluation process, it is proposed to take into account the following aspects that relate directly to banks: the procedure for client identification and analysis; monitoring and reporting on financial transactions; internal control, internal and external audits; compliance; personnel training and recruitment (or personnel competence), as well as national factors: legislative support, institutional support and prevention infrastructure (Nikkinen J. 2017).

When forming a methodical approach to the evaluation of the system of prevention and counteraction to legitimization of income of bank clients, it is important to determine the essence and content of the object of evaluation.

Minimization of risks of legitimization of income is one of the goals of the system of prevention and counteraction to legitimization of income of bank clients. The evaluation of the risk of using banking services for the purpose of money laundering makes it possible to determine the extent to which this goal has been achieved (Abu 2019).

In our opinion, the risk management of Ukrainian banks taking into account the expanded analysis of assessments of its components requires the following recommendations for improvement:

1. In the procedure for analysis of the risk of legitimization of income of bank clients, change the frequency of its conducting from once in nine months to once in six months.

2. To oblige the new products development department to carry out their examination of the risk of such products in relation to the risk of money laundering with the participation of the financial monitoring unit of the bank.

3. To oblige the bank marketing department to carry out an examination of future locations of separate bank divisions for the geographical component of the risk of money laundering.

4.   To set a high level of risk for all new products and services of the bank until their examination with the participation of the financial monitoring unit.

The developed recommendations for improving the most problematic components of systems to prevent and combat legitimization of income of bank clients create a scientifically sound basis for further development of these systems and reduce the risk of using the services of analyzed banks to legitimize suspicious incomes of their clients.

Conclusions

The conducted analysis of indicators reflecting the economic factors of legitimization of income for 2011–2018 revealed a declining trend in real GDP per capita and a consistently high level of the shadow economy (32–40 %), which contributes to the strengthening of legitimization processes. Along with the macroeconomic factors of legitimization of income, there are client and operational factors. Client factors are characterized by qualitative indicators of clients of the entities of primary financial monitoring, such as: type of activity of the legal entity, composition and residence of the beneficial owners, sphere of the main employment of the individual (for example, political and other public figures), purpose of opening of accounts.

The effect of operational factors can be traced by the indicators of cash volumes in the country, the volumes of cash transactions of the entities of primary financial monitoring. In the paper, it was found that in Ukraine, starting from 2009, the share of cash in the money supply increases from 84.9 % (2009) to 91.81 % (2019), but the share of cash operations of banks in the total volume decreases — from 30.01 % to 28.46 %, and so does the share of cash in GDP — from 15.09 % to 11.24 %.

The conducted analysis showed that the coefficient of variation of the flow of funds in the accounts of bank clients and cash flows can be used as an indicator of the risk of money laundering. In the paper, it was proven that banks with the highest (actually detected) risk of legitimization have the highest values of coefficients of variation — up to 120 % Based on the obtained results and taking into account the in-depth analysis of the most problematic components of the systems of prevention and counteraction to legitimization of income of bank clients, there have been developed appropriate recommendations for the improvement of the analyzed banks.

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Stanislav ZLYVKO, Doctor of Sciences (Law), Professor of the Department of Administrative, Civil and Commercial Law and Process, Academy of the State Penitentiary Service
ORCID ID: orcid.org/0000-0003-2732-3144

Serhii SHKLIAR, Managing Partner, Arzinger Law Firm
ORCID ID: orcid.org/0000-0003-2351-0161

Anatoliy KOVALENKO, Doctor of Law, Associate Professor, Associate Professor of the Department of Public Law Disciplines of a Private Institution of Higher Education, Kyiv International University
ORCID ID: orcid.org/0000-0003-3805-0989

Maksym SYKAL, PhD in Law, Associate Professor of the Department of Administrative, Civil and Commercial Law and Process, Academy of the State Penitentiary Service
ORCID ID: orcid.org/0000-0003-0334-4047

Oleksandr SNIGEROV, Doctor of juridical sciences, Professor, Principal Researcher at the Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations of the Ministry of Justice of Ukraine
ORCID ID: orcid.org/0000-0002-7303-2383

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INNOVATIVE BUSINESS DEVELOPMENT IN THE DIGITAL ECONOMY

Sergii Bogachov [1], Tetiana Pluhatar [2*], Olena Plakhotnik [3], Olha Alieksieieva [4], Volodymyr Bondar [5]

[1] *Financial University under the Government of the Russian Federation, 49 Leningradsky Prospekt, 125993, Moscow, Russia*
[2*,4] *State Research Institute of the Ministry of Internal Affairs of Ukraine, Eugene Gutsal Lane, 4A, Kyiv, 01011, Ukraine*
[3] *Dniprovsk State Technical University, Dneprostroyevskaya STR., 2, Kamenskoye, Dnipropetrovsk region, 51918, Ukraine*
[5] *Luhansk State University of Internal Affairs name E.O. Didorenka, Severodonetsk, Donetsk str., 1, 93401, Ukraine*

E-mails: [2] pluhatar@ukr.net*

Abstract. Ensuring innovative development of entrepreneurship requires comprehensive consideration of internal and external factors of the system under study, formation of strategies and programs of its innovative development for the purpose of increasing the innovative potential of its participants, active interaction between them, increasing the use of innovative technologies, generate ideas and transformations. In order to ensure stability, retailers are invited to adapt to changes in the macro- and micro-environment using in economic and financial activities innovative components that ensure competitiveness and anticipate crises. The purpose of the paper is the theoretical and methodological substantiation of scientific theses and the development of practical recommendations for the management of innovative business development in the digital economy. The theoretical and methodological basis of the study are the basic factors of economic theory, organizational theory, management theory, information theory, and scientific studies on the management of innovative business development in the digital economy. According to the conducted studies, there are significant "setbacks" of the market in the innovation area forcing the state to assume a number of organizational, financial and institutional functions to regulate the innovation cycle, in which there are more or less "non-market" phases. Today, there are a large number of indices and ratings in the world, with the help of which it is possible to assess the innovative development of the country in various areas of social life. According to the results of the conducted studies, the dynamics of indicators of innovation potential of Ukraine for 2014–2018 is quite slow, which confirms the need for additional incentives and support for organizations engaged in new developments, scientific and applied studies. The conducted analysis of the innovation activity of Ukraine shows its rather low efficiency, which together with political instability leads to a decrease in the investment attractiveness of business.

Keywords: innovative development; business attractiveness; entrepreneurial activity; digital economy; management

1. Introduction

The development of the modern economy is determined by the high rate of economic and technological transformations, which is increased by competition in industries and dynamic changes in the needs of the public. However, the domestic business sector demonstrates signs of prolonged stagnation, which overcoming is a critical task for the development of the economy of Ukraine at both macro and micro levels. Therefore, the selection of innovation as a driving force of progress simultaneously encourages positive changes not only in scientific thought, but also qualitative changes in the entire system.

According to the liberal economy concept, there appear special conditions for economic entities, which are based on the processes of the macroeconomic situation with the provision of appropriate institutional changes and are related to freedom of choice, pricing policy, collaborative processes and information flows. At the same time, business, as a whole system, affects all components of the structure of the organization, which disturbs their independence, affects the dynamics of development inhibiting the progress of changes both at the national level and at the level of each individual organization. This is especially true of innovative business development in the context of digital transformations, which is a new dimension of reality with the definition of digital leadership.

In the modern world digital technologies create fundamentally new opportunities for building interaction between the state, business and the population eliminating long chains of intermediaries and accelerating various transactions and operations. Such factors come to the fore due to the rapid development of information technologies and globalization of the economy, which offer fundamentally new concepts of consumption and open additional potential for the development of new markets and innovative solutions.

But at present, the digitalization of the economy of Ukraine is actually narrowed to the development of communication and information networks, as the digital infrastructure of Ukraine is underdeveloped. Thus, according to Speedtest.net, the world positions of Ukraine by the indicators of Internet connection quality are quite low: the 114th positions by the quality of mobile Internet and the 45th place by the quality of broadband Internet (Exploring Fixed Broadband and Mobile Network Performance in Ukraine (2019)). Besides, if Ukrainian IT companies can afford state-of-the-art equipment, small and medium-sized businesses, potential buyers of their products and services in Ukraine, are limited in both technology and finance. This also applies to an average consumer, who, for the same reasons, does not have full access to modern digital benefits.

It is obvious that in such conditions, organizations, including trade ones, need to intensify innovation and technological development, to be innovative, so as not to lose global competitiveness and connection with their customers. The solution of this problem belongs to the type of complex multicriteria tasks, which actualizes scientific and economic studies from the perspective of theoretical and methodological, as well as institutional base of business management, its innovative development in the digital economy, needs clarification, revision, supplementation and deepening.

2. Literature review

At present, new technological solutions allow not only more economical use of finite and non-reproducible natural resources but also the gradual abandonment of their use, as modern economic theory, its industrial paradigm is unable to reveal the processes and phenomena characteristic of the new economy and society. Human civilization has entered a phase, which is important for it, and which should be defined as a change of epochs of economic knowledge (Ghanbari et. al (2017); Shevyakova et al. (2021)). The formation of the knowledge economy is facilitated by the exponentially growing demand for services provided through information and

communication technologies — ICT (cellular and satellite communications, digital television and radio, Internet, e-government, e-democracy, etc.) (Ismail et. al (2017)).

The main feature of modern economic and social development is its globalization. In these conditions, the key principles of the economy are changing: new objective laws appear; in the area of production, distribution, exchange and consumption of essentials, information technologies are increasingly used; the basis of the latest technologies are innovative solutions, which require new investments, all this comes down to the fact that there appear new types of product: knowledge, information, intellectual property; new (electronic) forms of money. On this basis, the foundations are created for the introduction of a new kind of economy: digital, which can act as a unifying link of all these components (Olbert & Spengel (2017)).

That is, "in the conditions of the accelerated development of the information society in Ukraine, which leads to the deployment of globalization, improvement of information technologies, transformation of information into important business tools, new tasks are set, a new vision of informatization of enterprise management is required" (Richter et. al (2017)).

The economy needs changes, transformations and innovations, which are provided by the generation and implementation of new knowledge, which is directly dependent on the planetary information sphere as a result of adaptation of social and economic institutions to the formation of information paradigm of the modern world. The need to change the inertial industrial development to the innovative development, which meets the requirements of the modern stage of the scientific and technical revolution, has become logical (Watanabe et. al (2018)). The basis of such changes is science as the highest level of development of the control mind, rational and irrational thinking, creativity of intellectual decisions, development of previously unexplored problems (Holford (2019)).

For traditional concepts it is typical to endow economic relations with market characteristics leveling conditions and principles that do not meet the demands of the macroeconomic environment. A market participant is a person separated from formal institutions with the possibility of independent influence on market relations (Catalini (2017)). However, such a display of independence is accompanied by the negative influence of subjectivism, which is inherent in the traditional views of economists with a lack of maneuvering in the policy of both macroeconomic and microeconomic development.

Today, modern economics is based on innovative approaches to the regulation of socio-economic relations, which is a logical consequence of the development of multimedia space with the ability to manage information thus revealing the new properties of the economy, market and society (Nambisan et. al. (2017)). The economic existence of the individual is at the intersection of the processes of transformation and radical changes caused by the evolution of the idea of economic and information processes with the revision of traditional economic theory as one that does not correspond to modern realities.

However, despite significant scientific achievements, the problem of digital transformation of business through innovative development in a country, which affects the transformation of organizations, including trade ones, remains underdeveloped, which requires further scientific, methodological, practical studies and justifications.

3. Research Methodology and Data

The theoretical and methodological basis of the study are the basic factors of economic theory, organizational theory, management theory, information theory, and scientific studies on the management of innovative business development in the digital economy. In the process of the study, the following scientific methods and techniques were used: observation, sampling and grouping — for theoretical justification during the identification of problems and trends regarding the subject of the study; generalization and comparative analysis — to form a

strategy for innovative development management, logical-structural and graphic modeling — to illustrate the essence of phenomena, relationships between elements of the system, directions of change in the digital economy.

The information base of the study consisted of laws and regulations of Ukraine, special literature, data of international ratings, the State Statistics Service of Ukraine and other ministries and agencies, data from financial statements of trade organizations.

The purpose of the paper is the theoretical and methodological substantiation of scientific theses and the development of practical recommendations for the management of innovative business development in the digital economy.

4. Results

Reorientation of Ukraine to innovative development is possible only under the condition of large-scale implementation of innovative projects, and the transition to an innovative model of economic growth is one of the main tasks of the state in the near future. Directions of innovative development of the enterprise in the digital economy can be classified on various grounds. But none of the shown components of ensuring successful innovative business development has a complete scientific solution, and the current management practice in Ukraine indicates a relatively low level of use of new knowledge.

It is possible to identify some contradictions between the growth of the traditional economy and innovative business development, as this may not be related to innovation at all. This indicates that economic relations have been transformed into a qualitatively new stage of its development, one of the manifestations of which is the formation of national innovation systems (NIS) and their competition. According to statistics, currently in Ukraine 834 enterprises are innovatively active (National Accounts (GDP) (2020)).

The role of the state is complicated by the support of targeted structural changes and institutional reforms that promote the realization of scientific and technological potential, R&D, opportunities for intellectual and creative resources of human capital — within a single consensus of "science – education – production". "Setbacks" of the market in the innovation sphere force the state to assume a number of organizational, financial and institutional functions to regulate the innovation cycle, in which there are more or less "non-market" phases.

We consider it appropriate to use the term "innovation portrait/scoreboard" to reflect the economic condition of an object, as today the world uses a large number of indices, ratings, factors helping to assess and reflect the innovative development of a country in various areas of social life (Figure 1).

	Global Firepower Index ranking	Business Freedom Index	Global Innovation Index ranking	Global Competitiveness Index ranking	Doing Business Index ranking	Investment Attractiveness Index ranking	Corruption Perception Index ranking	Global Media Freedom Index ranking	Prosperity Index	Digital Competitiveness Index ranking	Passport Indices	Global Peace Index	Democracy Index	Rule of Law Index	World Happiness Index ranking
2014	21	155	63	84	112	109	144	127	102	50	53	141	92	68	111
2015	21	162	64	76	96	89	142	129	107	59	63	150	88	70	123
2016	25	162	56	79	83	130	130	107	107	59	58	156	86	78	132
2017	25	166	50	85	80	134	131	102	112	60	58	164	86	78	138
2018	30	150	43	83	76	131	130	101	111	58	41	152	83	77	133

Fig. 1. Innovative scoreboard of the position of Ukraine in the world ratings
Source: built by the authors according to Position of Ukraine in the Global Competitiveness Index 2016–2017 Rankings (2017), Digital Economy and Society Index (2019), Digital single market. Bringing down barriers to unlock online opportunities (2019), Digital globalization: The new era of global flows (2019)

Among them, the most detailed and complete description of the country is provided by the Global Innovation Index (GII), which allows to obtain an assessment, including of Ukraine, by comprehensive parameters, namely those of: human capital and research; infrastructure; market and business condition; level of technological development and creative results. Consideration and analysis of these parameters contributes to the development of effective state policy focused not only on innovation of production, but also on the development of research, education, intellectualization of capital, etc.

The Innovative Input Subindex covers five input indicators: institutions; human capital and research; infrastructure; market condition and business condition. The Innovation Output Subindex consists of the following key indicators of innovation results: level of technological development and creative results. Overall GII score is calculated as the average of the input and output subindex data.

The rating of Ukraine among the countries of the world changed under the influence of external factors in 2017–2018 (Ukraine had the 45th position in the Global Innovation Ranking (2020)):
1) Global Innovation Index in 2017 — 36.45 scores (50th position of 127 countries), in 2018 — 38.52 scores (43rd position of 126 countries);
2) Global Competitiveness Index in 2017 — 4.00 scores (85th position of 138 countries), in 2018 — 4.11 scores (81st position of 137 countries);
3) Social Globalization Index — an impressive decrease from the 33rd place in 2017 to the 49th place in 2018 among 207 countries.

To form a holistic picture of the innovation potential of Ukraine, we will analyze the innovation development indicators of the country for 2014–2018 (Table 1).

Table 1. Innovation scoreboard of the dynamics of the components of the global innovation index of Ukraine for 2014–2018

Innovation potential components	2014		2015		2016		2017		2018	
	score	position	score	position	score	position	score	position	score	position
Global Innovation Index	36.3	63 of 143	36.45	64 of 141	35.7	56 of 128	37.6	50 of 127	38.5	43 of 126
Innovation Input Subindex	38.2	88	39.06	84	38.9	76	41.0	77	42.2	75
Institutions	52.9	103	52.2	98	48.7	101	47.9	101	49.1	107
Human capital and research	36.6	45	40.4	36	40.8	40	39.6	41	37.9	43
Infrastructure	27.1	107	26.3	112	32.3	99	39.3	90	38.1	89
Market condition	45.1	90	43.9	89	42.1	75	43.2	81	42.7	89
Business condition	29.1	87	32.4	78	30.6	73	35.3	51	34.5	46
Innovation Output Subindex	34.4	46	33.85	47	32.5	40	34.2	40	39.8	35
Development of knowledge and	38.2	32	36.4	34	34.1	33	32.8	32	36.7	27
Results of creative activity	30.6	77	31.3	75	31.0	58	35.6	49	36.5	45
Innovation Performance Index	0.9	14	0.9	15	0.8	12	0.8	11	0.9	5

Source: built by the authors according to Digital Economy and Society Index (2019), Digital single market. Bringing down barriers to unlock online opportunities (2019), Digital globalization: The new era of global flows (2019)

According to the conducted studies (Figure 2), the dynamics of indicators of innovation potential of Ukraine for 2014 - 2018 is quite slow. The achievement of the obtained result was positively influenced by the development of institutions, knowledge and technologies, business condition and the results of creative activity.
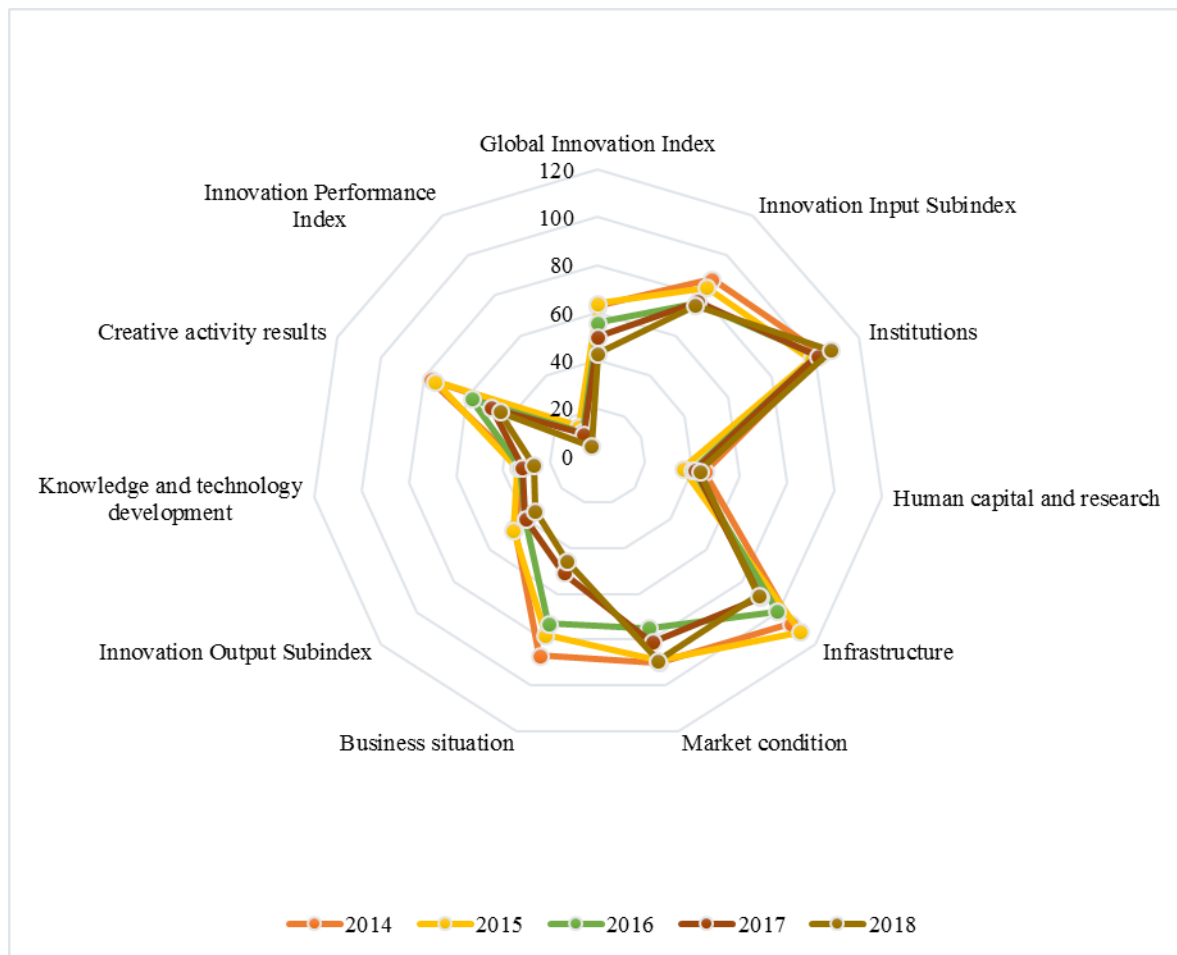
Fig. 2. Innovation scoreboard of the dynamics of the components of the global innovation index of Ukraine for 2014–2018
Source: built by the authors according to Digital Economy and Society Index (2019), Digital single market. Bringing down barriers to unlock online opportunities (2019), Digital globalization: The new era of global flows (2019)

Infrastructure remained almost unchanged, but human capital and research indicators, as well as the market condition in 2018 decreased significantly. This may indicate the need for additional incentives and support for organizations engaged in new developments, scientific and applied research.

Also, the main developments are carried out by specialized research organizations, which at present, unfortunately, are far from production processes, which may slow down the introduction of innovations and new technologies. For the effective penetration of new technologies into practice, it is important to bring science and business as close as possible, to establish a mechanism for technology transfer.

The "institution" indicator includes the political situation, the legal framework and the business environment. That is, in the state institutions form the basis within which private enterprises, companies and government agencies interact with each other to generate income and ensure economic prosperity. The institutional framework is extremely important for maintaining competitiveness and economic development. In 2018 the rating score of institutions increased significantly to 49.1 points compared to previous years (48.7 in 2016, 47.9 in 2017). A positive trend is observed in the business situation. According to this indicator, Ukraine moved from the 87th place in 2014 to the 46th place in 2018.

The global Doing Business 2017 study published by the World Bank determines the rating as regards the conditions for doing business created in the world countries. The rating covers 190 countries and the conditions for doing business in them. In 2018, Ukraine ranked 81st among 137 countries in the global rating of countries by the indicator of economic competitiveness (in the previous year it ranked 85th) (Position of Ukraine in the rating of world countries by the global competitiveness index of 2016-2017 (2017)).

In 2018, the indicator of development of knowledge and technology also increased, as well as the results of creative activities, which are somewhat interrelated and indicate a harmonious combination of economic, social and environmental factors, which ensure protection of future generations, provide opportunities for development of freedom of life choice, in particular, creating favorable conditions for small and medium-sized businesses (tax holidays, soft loans, business consulting, etc.).

Infrastructure is important for the efficient functioning of the economy, as it is an important indicator in determining the location of economic activity, stimulates competition and has a significant impact on economic growth. However, unfortunately, the infrastructure has hardly changed its value in the rating. Quite a different situation is observed in the political environment. In recent years, the country has consistently ranked 122nd or 123rd in the rating, and this is almost the penultimate position among the world countries (Digital Economy and Society Index (2019)). Human capital and research indicators are also negative, especially for the level of education, which is losing its position, even from 2016 to the present, ranking 20th, 30th and 34th, respectively. However, it is these factors, which determine innovative development.

Thus, the conducted analysis of the innovation activity of Ukraine shows its rather low efficiency, which together with political instability leads to a decrease in investment attractiveness. Problems arising as a result of the innovative activity of organizations often have an economic, even macroeconomic nature, are manifested in the imbalance of economic processes, slowdown (for the period of transformation) in economic growth, irrational use of resources (lack or excessive consumption in some cases).

Effective business activity is a source of economic growth, which provides employment in the country and directly affects the quality of life of the population. Intensification of competition in domestic and foreign markets, the appearance of its new forms, differentiation of consumer demand require the search for new directions of formation of competitive advantages of domestic enterprises in the context of globalization.

Therefore, the study set a task to obtain new knowledge on the management of innovative business development in a digital economy, which can be solved through the transition to controlled socio-cultural evolution based on creative intelligence, building a socially oriented economy, which provides the necessary conditions for harmonization in the chain: "individual-enterprise-society-state", and their widest possible distribution among all participants of this process.

Today digital technologies are changing the environment, including the economic environment. Therefore, it is advisable to analyze our own institutional field where the digitalization of our economy and public administration will be deployed (Figure 3).
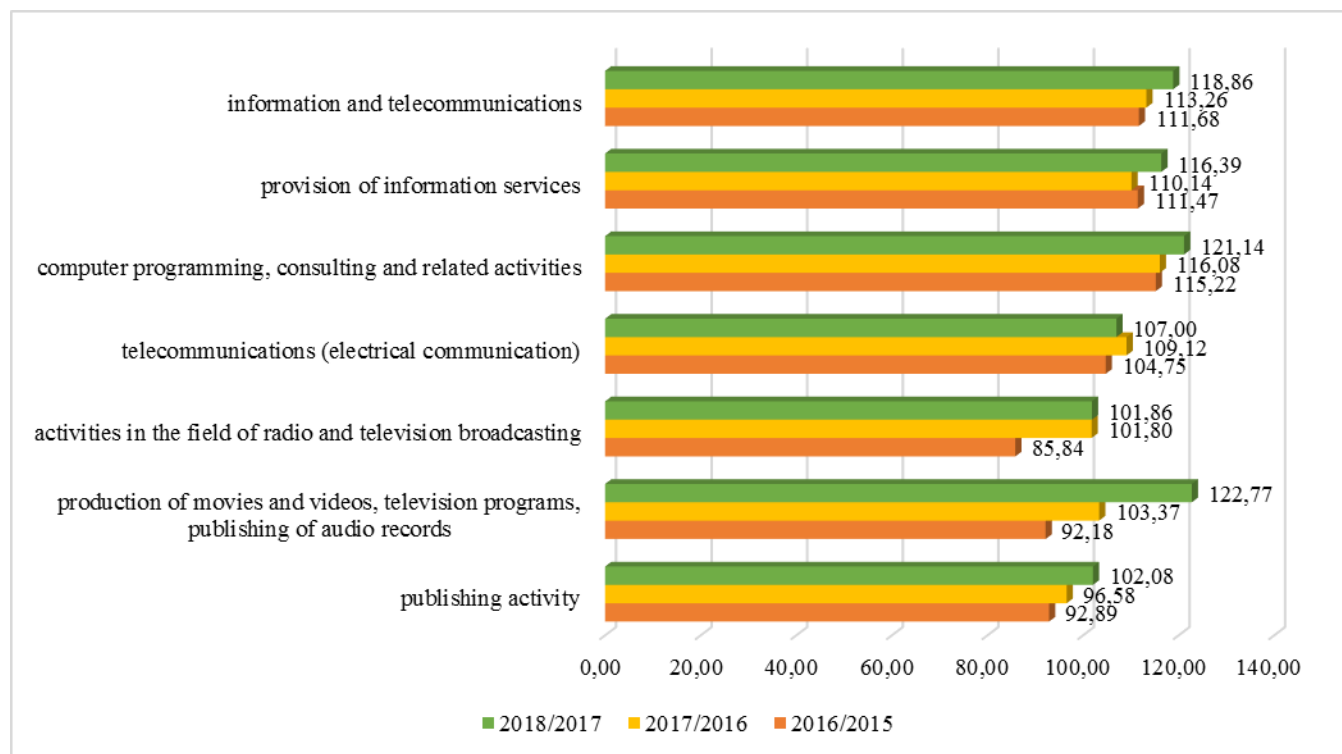
Fig. 3. Relative growth of the number of business entities by types of economic activity directly related to the digitalization process in Ukraine in 2015-2018, %
Source: built by the authors based on National Accounts (GDP) (2020)

Thus, despite the decrease in the total number of economic entities, the number of economic entities in Ukraine, which are directly related to the digitalization process, for example, in computer programming, consulting and related activities, has been growing since 2015. Their number increased from 79,657 to 129,066 (2018), but this process is quite slow averaging about 2 % growth per year.

Specialists and managers of organizations understand that without the use of digital technologies they will not be able to compete successfully in either domestic or foreign markets and appreciate highly enough the effectiveness of their already implemented solutions.

However, organizations approach these technologies very pragmatically and focus on what is no longer possible to do business without and rushing to invest in fundamentally new areas. It is obvious that rapid and, at the same time, accurate changes in the regulatory framework will be necessary, and it is already important to understand which aspects of them do not sufficiently correspond to the digital challenge, and which are simply absent. Finally, a significant number of organizations believe that they could be strongly encouraged to make greater use of digital technologies by receiving some government support and quality regulatory environment, which can indeed improve the well-being of society. However, the impact of such regulatory environment can be both negative and positive, which is not always obvious. For example, the behavior of entrepreneurs and individuals is largely due to changes in the regulatory framework, but these changes are often insignificant and difficult to predict or assess.

And it is particularly difficult to assess the regulatory impact in the long run, as it is highly dependent on changes in the economic and social spheres. Indeed, the assessment of the impact of a normative legal act is often based on limited information and sometimes on "assumptions" about who and how this regulatory document affects. Thus,

a system approach is needed to identify and assess regulatory impact. Only this way legislators can be sure that the benefits of their policy can outweigh the costs it involves.

The conducted analysis shows that, despite the fact that according to the Internet Association of Ukraine, there are 21.6 million users of the Internet in Ukraine, among them the most active users belong to the following categories: schoolchildren/students, owners or directors of large and medium-sized businesses and servicemen (the level of Internet use of these groups was 100 %) (Internet Association of Ukraine launches the project "SOS Provider" (2020)). In 2019 in Ukraine the share of Internet trade was only 6.77 %, and the annual growth index decreased significantly compared to previous years and amounted to only 14.17 % in 2019 (Figure 4).
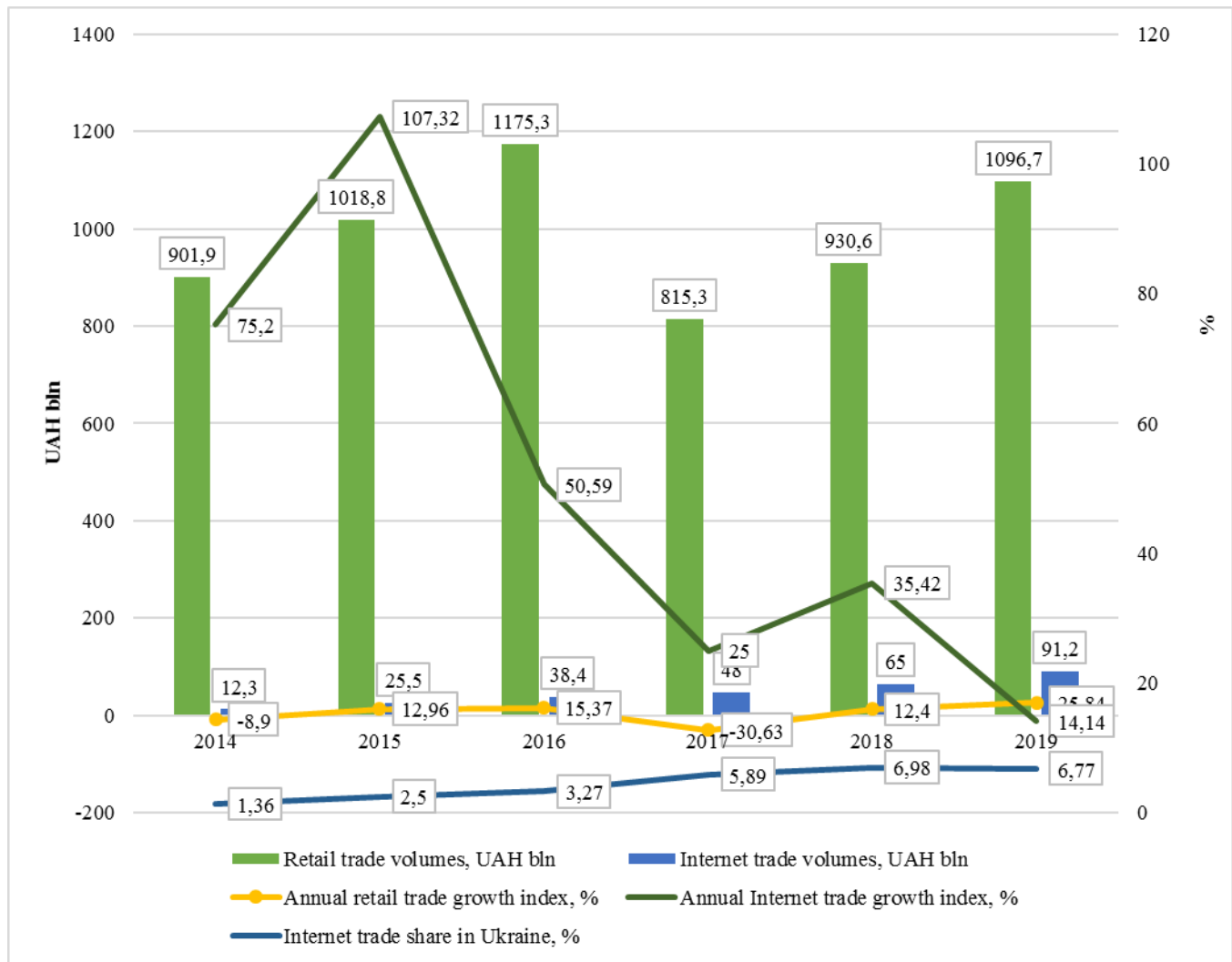
Fig. 4. Dynamics of indicators of Internet trade development in Ukraine
Source: built by the authors based on National Accounts (GDP) (2020).

Unfortunately, such a slow development of e-commerce once again confirms the imperfection in Ukraine of the regulatory framework for digitalization of business, the weakening of the economy as a whole, the passivity of organization management regarding the implementation of innovative technologies of business development, as its transformation requires structuring and systematization of relevant processes in organizations, and relations between them, which are constantly undergoing transformations, timely adaptation of management activities in a

dynamic information environment, which contributes to the transformation of the management system, its constituent elements and the relationship between them.

Thus, given the significant role of retail chains, which are directly interested in the results of bringing goods to the final consumer, and especially those, which represent the interests of specific manufacturers and profess a policy of loyalty to consumers, it is safe to state their direct involvement in the implementation of the concept of innovations initiated by consumers.

In the course of introduction and use of digital technologies there appear inhibiting factors, including: lack of investment resources for project implementation and further maintenance of IT systems; problem with staffing of the "digital revolution": there is a lack of both IT specialists and users who are able to properly and effectively use innovative technologies; innovative solutions do not always find a response from suppliers and consumers who continue to work in the old way; insufficiently developed infrastructure; inefficient use of information resources.

5. Discussion

The conducted study identified the following areas in which the state could support Ukrainian enterprises in the development of modern digital technologies.

Encouraging competition, creating conditions for equal competition. The digital economy is developing simultaneously in a wide range of areas, so it is impossible to build it through the efforts of a limited number of organizations endowed by the state with special powers and resources (Veselovsky et. al (2018)). Therefore, the central role in this economy will be played by private business with a strong entrepreneurial basis, as well as the authorities, which main task is to create the infrastructure and conditions for private initiative.

Formation of general technological platforms. Often a serious barrier to the widespread use of digital technologies is the need for a simultaneous adoption of them by a whole group of organizations, which form cooperative chains. To reduce this barrier, the state can act either as an organizer of broad consortia or technology platforms uniting various interested organizations (for example — work in the field of "Internet of Things"), or as a regulator directively setting requirements for the use of certain technological solutions (for example — automated systems in retail trade, online cash registers, etc.). Although the forced use of digital technologies in some cases causes business dissatisfaction due to the need to incur unforeseen costs, in the medium and long term, it has a positive effect through the synchronization of the implementation of standard technological solutions in entire segments of the economy (Sturgeon (2021)).

Changes in legal regulation. The conducted analysis indicates the presence of significant shortcomings in the legislation of Ukraine. It needs to be revised taking into account new types of relations, their legal structure (new objects and subjects of information legal relations, specific rights, duties and responsibilities). Large-scale work with the conceptual framework of information law and the elimination of legal obstacles, which are currently present in information law and the practice of its application are required. In particular, some legal institutions need to be developed in the digital economy. It is necessary to form a single trust in the digital environment through the development of trusted services: identification and authentication of interacting entities, protection against unauthorized access to documents, verification of authority to sign documents, etc. A special intermediate mode is required for categories of data, which do not belong to the category of restricted information, but potentially have such nature. There become acute the issue of development of the market of services related to personal data management, etc. (Pazaitis et. al (2017)). At the same time, the state should not "run ahead" trying to rigidly regulate the processes, which are in the process of development, for which users themselves have not yet formulated their requirements. Moreover, the adoption of regulations governing the development of the digital economy should take place in dialogue with users, developers, service providers.

Qualified customer. The state generates a significant demand for various products and services, as well as provides a large number of services. Many of these products and services can be provided using digital technologies. By forming an order to increase the digitalization of its own activities, the state thus not only stimulates the development of companies in the field of ICT, but also sets standards for working with digital technologies, forms a culture of working with them in a wide range of economic entities (Quinton et. al (2018)). As positive examples here we can mention the program "Electronic document management", the transition of tax authorities to electronic reporting, the use of plastic cards for social benefits, etc.

Introduction of additional tax incentives for the development of digital technologies. All experts highly appreciate the importance of reduced insurance premiums for the growth of IT companies. They are unanimous that it is necessary to continue this benefit. The expediency of introducing a tax benefit for the amount of capital investments in modernization is currently being discussed. In the case of appearance of such benefit, it would encourage, inter alia, more intensive investments of companies in digital technologies (Teece (2018)). It will also be extremely important to regulate tax issues in cross-border online trade. This will give a positive impetus to the development of this business segment.

Personnel training and distribution of information about digital technologies. The widespread use of digital technologies will inevitably contribute to significant changes in the structure of employment and the relevant qualifications of employees. There will arise a need in a large number of IT professionals, programmers, and skilled users who know how to work in a digital environment. Furthermore, there is already a clear shortage of so-called "digital leaders" and digital entrepreneurs, that is top managers who understand how to carry out digital transformation of business processes. A separate task is the work of the state with the media in order to prepare our citizens for future changes, to warn of risks, to conduct digital education (Li et. al (2016)).

Ensuring cybersecurity. Ensuring that collected, stored and used data are protected from criminal encroachment is a critical condition for the development of the digital economy. Ultimately, only the state can provide such confidence (1Koch & Windsperger (2017)). To do this, it is necessary to solve several problems: develop legal norms to combat cybercrime, have qualified cybercops, develop technological solutions and standards, ensure cross-border cooperation (because cybercriminals know no borders).

Development of new technological solutions. In digital technologies, the path from basic exploration to commercial application is quite short. Here is an example: studies on quantum computers or artificial intelligence are rapidly move into the commercial stage. In these conditions, the state must not only maintain a high level of funding for scientific projects from the budget, but also find the right tools to attract private funds in exploratory studies, stimulate development of corporate science, develop pilot research projects, train managers of scientific organizations capable of combining the qualities of scientist and entrepreneur.

Promotion to foreign markets. The growing wave of fundamentally new products and services based on digital technologies gives a new chance to Ukrainian manufacturers. Rapid growth in exports of IT products is quite possible. The state can support this trend by providing marketing information, supporting participation in foreign exhibitions and conferences, providing subsidies and guarantees for export credits, reimbursing the cost of patenting, forming investment funds aimed at concluding M&A agreements abroad.

Cross-border cooperation. The development of modern digital technologies has made national borders transparent. The joint teams including representatives of different countries are working on innovative projects, new solutions and services are instantly spreading around the world, competition has acquired a transnational nature. Attempts to impose restrictions on international cooperation very quickly undermine the competitive position of domestic producers. As a result, too straightforward struggle for national security leads to its own

undermining. It is necessary to ensure for Ukrainian users the possibility of the use of services offered by the world market, cross-border transmission of non-classified data (including in the framework of scientific and technological exchange, medical consultations) or telemetry data on the operation of industrial equipment). The inclusion of Ukrainian companies into global technology alliances forming technology standards for years to come should be encouraged.

Conclusions

It was determined that the globality of the information space encourages the use of knowledge as a key competence in the formation of an information society, and the development of the information system fully depends on institutional, intellectual and innovation-resource support in space-time coordinates and is a sign of innovation. There was suggested a new ideology of the process of innovation as a prognostic idea of business development in the digital economy at the macro and micro levels, which makes it possible to ensure an integrated effect during the transformation of modern global socio-economic processes.

As part of the development of the conceptual paradigm of business development research, there was carried out a consistent consideration of methodological issues of assessing the state of domestic business, parameters of the structure and features of institutional organization of enterprises, digitalization of business, identification of the business and investment climate, competitiveness of business environment for assessing its effectiveness, which allows to substantiate the model of effective business organization using the methods and means of institutional design.

It was determined that the number of registered business entities in Ukraine has been declining recently, which is due to the instability of the economic situation against the background of the joint force operation, imperfection and inconsistency of the legal framework, which requires constant monitoring of changes and adjustments of activities, social sentiments in society at the macro level, the poverty of Ukrainian society, which creates social tension exacerbated by unfulfilled promises of political leaders, etc. Over a five-year period, the annual innovation index ratings have a similar dynamics, and a significant difference in 2014–2015 can be attributed to the escalation of geopolitical tensions, which has made significant adjustments to the development of the economy of Ukraine. The conducted study helped to identify areas, in which the state could provide support to Ukrainian enterprises in the development of modern digital technologies.

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Sergii BOGACHOV, Doctor of Economic Science, Professor, Financial University under the Government of the Russian Federation, Russia
ORCID ID: orcid.org/0000-0002-8938-0315

Tetiana PLUHATAR, Candidate of Science of Law, Senior researcher, Academic Secretary of the Academic Council of the State Research Institute of the Ministry of Internal Affairs of Ukraine
ORCID ID: orcid.org/0000-0003-2082-5790

Olena PLAKHOTNIK, Doctor of Economic Sciences, Professor, Dniprovsk State Technical University, Ukraine
ORCID ID: orcid.org/0000-0001-9717-2877

Olha ALIEKSIEIEVA, Candidate of Science of Law, Leading researcher of the State Research Institute of the Ministry of Internal Affairs of Ukraine
ORCID ID: orcid.org/0000-0003-3390-536X

Volodymyr BONDAR, Candidate of Law, Docent, Dean of the Faculty of Training Specialists for Units of the National Police of Ukraine, Luhansk State University of Internal Affairs name E.O. Didorenka
ORCID ID: orcid.org/0000-0003-1552-4555

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ENTREPRENEURIAL ACTIVITY OF THE IT SECTOR IN THE CONDITIONS OF THE COVID-19 PANDEMIC AND IN THE POST-QUARANTINE PERIOD

Vladislav Fedorenko [1*], Natalia Filipenko [2], Inesa Shumilo [3], Volodymyr Nesterovych [4], Svitlana Nischymna [5]

[1*]*Research Center for Forensic Examination on Intellectual Property of the Ministry of Justice of Ukraine, 26, L. Ukrainka Boulevard, office 501, Kyiv, 01133, Ukraine*
[2] *Zhukovsky National Aerospace University "Kharkiv Aviation Institute", Chkalova Street, 17, Kharkiv, 61000, Ukraine*
[3] *Yaroslav Mudryi National Law University, 77 Pushkinskaya Street, Kharkiv, 61024, Ukraine*
[4] *Lugansk State University of Internal Affairs named after E.O. Didorenko, Donetsk Str., 1, Severodonetsk, 93400, Ukraine*
[5] *Academy of the State Penitentiary Service, Honcha str. 34, Chernihiv, 14000, Ukraine*

E-mails: [1] fedorenko@ukr.net (Corresponding author)*

Abstract. Despite the rapid growth rate, the IT sector of Ukraine is characterized by a weak competitive position due to work in the low-cost segment and growing competition from companies located in low-income countries; mainly outsourcing model of IT business development, which is determined by a low level of margins. This model of development of the IT sector of Ukraine is due, in particular, to the low efficiency of competitiveness management technologies used by IT companies. The latter actualizes the development of adequate mechanisms for managing the competitiveness of companies in the IT sector of Ukraine. The purpose of the paper is to develop the theory and procedural guidelines for the formation of assessment and forecasting of the level of competitiveness of companies in the IT sector. The works in the field of cognitive management, cognitive control, adaptive management, proactive management, competitiveness management are the theoretical-methodological basis of the paper. The assessment and forecasting of the state of the environment of 20 IT companies of Ukraine were carried out, the inertial scenario of their development was created, and forecasting of threats to sustainable operation of the companies was carried out. Comparison of the current and forecast level of competitiveness allowed to assess the stability of competitive positions of the companies, to identify the IT companies, for which it is advisable to develop proactive strategies aimed at reversing the negative trends, which are formed according to forecast data on the accepted competitiveness management strategy. It was demonstrated that the negative consequences of the "shock" of COVID-19 (in particular, 61 of the 68 largest companies in the IT sector (90 %) included in the S & P500 index are characterized by negative market value dynamics) lead to the need to consider adaptive strategy as a focus strategy.

Keywords: money laundering; shadow economy; business activity; stability; risk

1. Introduction

Maintaining quarantine restrictions on certain types of economic activity against the background of the general trend of economic stagnation led to critical risks for national entrepreneurship. The sharp decline in the activities of small and medium-sized enterprises (hereinafter — SMEs) in Ukraine can have devastating systemic consequences for the national economy leading to: declining GDP and deteriorating macroeconomic imbalances, destabilization of the banking system due to defaults of business entities and individuals-borrowers who lost their jobs, growing unemployment, increasing receivables and payables. Quarantine measures have exacerbated the problems of uneven impact of quarantine on certain segments of entrepreneurship at the national and local levels, i.e., micro and small businesses have suffered more, which makes actual the task of setting priorities for SME support.

The "cascade" model of the crisis is typical for the current stage of the economic development of Ukraine. Thus, in the crisis periods of development, the decrease in GDP was 16.4 %, and in the periods of economic recovery it increased only by 11.5 %. Experts predict that this model of crisis may be repeated in the future. In particular, the economic "shock" of the COVID-19 pandemic could have similar consequences: the rate of recovery of economic activity in Ukraine may be much slower than in other countries, such as countries close to the level of economic development of the Eastern European bloc.

Crisis trends in economic development lead to negative changes in the social sphere: tax revenues are reduced, the budget deficit is growing, social protection programs are reduced, social tensions are growing, the share of the population living below the poverty line is increasing, the intensity of migration trends is increasing.

The current situation brings to the fore the implementation of an effective economic recovery strategy announced by the Ministry of Economic Development, Trade and Agriculture in February 2020 (National Economic Strategy 2030 (2021)). Within the framework of the announced strategy there were identified sectoral priorities aimed at forming economic zones of outpacing growth, development of sectors that generate impetus for cluster development of related industries and ensure effective integration of the domestic production and economic system into global value chains.

The development of the IT sector was determined as one of such sectoral priorities. According to experts, it is this sector that has the highest level of competitiveness, level of innovation of the used technologies and skills. The IT sector accounts for 4% of GDP, a significant share of newly created jobs (National Accounts (GDP) (2020)). According to the NASSCOM association, the attraction of one programmer in the sector leads to the creation of 4 jobs in related industries (Essential Information. NASSCOM (2021)).

2. Literature review

A number of leading countries are implementing large-scale national business support programs to minimize the effects of quarantine restrictions, to improve liquidity, minimize the effects of supply chain disruptions, providing tax benefits and vacations, business cash subsidies, lower interest rates and implementation of credit programs.

Thus, according to IMF estimates (IMF Digest of the COVID-19 Response Policy (2021)), Poland provided for the provision of credit guarantees and microcredit for entrepreneurs in the amount of PLN 75 bln (3.3 % of GDP in 2019), Romania — through the provision of initial guarantees of 10 bln lei (1 % of GDP) for guarantees on loans and subsidized interest for working capital and investments of SMEs; Estonia provides loans to rural companies through the Agricultural Development Fund (€200 mln), guarantees secured by bank loans to reschedule payments (€1 bln), business loans to support company liquidity (€500 mln), investment loans to

companies (€50 mln); the United Kingdom allocates £27 bln in small business grants to affected sectors, launch of Coronavirus Affected Business Lending program to support SMEs; Italy implements measures to support credit proposals (€5.1 bln); Germany allocated €50 bln in subsidies to small businesses and the self-employed, expanding and accessing government loan guarantees for firms, allocating at least €822 bln for these purposes (24 % of GDP).

In general, the governments of many countries have directed significant public funding to support the economy, in particular: Estonia — €2 bln (7 % of GDP), Latvia — €1 bln (3 % of GDP), Lithuania — €2.5 bln (5 % of GDP), and Italy — €25 bln (1.4 % of GDP). In China, Germany and the USA there have been approved and implemented measures on health care, sick lists, small business loans and international assistance amounting to 1.2 % of GDP (1.3 trillion yuans), 4.5 % of GDP (€156 bln) and 0.5 % of GDP, respectively. An additional USD 2 trillion is expected to be allocated (about 10 % of GDP). For Ukraine, expenditures to combat COVID-19 are incomparably lower (Operational information on expenditures to combat COVID-19 (2021)) and amount to UAH 1.972 bln and are related to much smaller financial and economic opportunities of the national economy.

A study of the activities of SMEs in quarantine has identified such risks:
- Cessation of business. According to the Info Sapiens survey (60 % of Ukrainians have suffered financial losses due to the coronavirus pandemic (2020)), only 66% of SMEs will be able to diversify their activities, unlike companies in highly specialized segments, which will be forced to cease operations. The largest negative impact is experienced by industry, wholesale and retail trade and agriculture, which create 44 % of value added and provide 55 % of jobs (60 % of Ukrainians have suffered financial losses due to the coronavirus pandemic (2020)). Although the hotel and restaurant business has a small share (1 %) in the economy structure, 60 % of it are small enterprises, which need support in the first place.
- Liquidity deficit. The presence of cash gaps and the lack of sufficient savings do not allow many SMEs to cover fixed operating costs in the case of suspension of operations. The possibility of cessation of business through quarantine is considered by 3 to 10 % of SMEs (60 % of Ukrainians have suffered financial losses due to the coronavirus pandemic (2020)).
- Large-scale reduction and narrowing of the structure of consumer demand. Reducing the demand for non-essential goods/services will dramatically affect the decline in revenues of enterprises in other areas of activity. 62% of the population have negative consumer expectations (60 % of Ukrainians have suffered financial losses due to the coronavirus pandemic (2020)).
- Disruption of the value and supply chains. Well-established business processes, namely buying/logistics/sales are disrupted during quarantine activities, and due to the shutdown of some partners, SMEs are forced to resume operations by way of search for new alternative markets for raw material supply and service outsourcing (Maritz et. al (2020)).
- Loss of the domestic sales market. Decreasing incomes of the population during the quarantine period will reduce the domestic market (Battaglia et. al (2021)). Currently, there is no effective compensation mechanism, which can effectively restore the business activities, and representatives of the segment can not predict either the period of the crisis or the tools to overcome it (Leach et. al (2021)).
- Uncertainty in foreign markets, primarily regarding post-quarantine volumes, terms and opportunities for export recovery (Ketchen & Craighead (2020)).

3. Research Methodology and Data

The scientific works in the field of cognitive management, cognitive control, adaptive management, proactive management, competitiveness management are the theoretical-methodological basis of the paper. To solve the tasks set in the paper there were used both general scientific research methods such as logical-theoretical generalization, analysis, synthesis, and special ones such as the methods of expert analysis, methods of analysis of panel data, scenario modeling.

The combined use of machine learning methods, expert analysis, panel data analysis methods allowed to solve the problem of developing a methodical approach to assessing the stability of competitive positions of IT enterprises. The information base of the study is the data of such professional public organizations as Kharkiv IT Cluster, Lviv IT Cluster, Kyiv IT Cluster, IT Ukraine Association, statistics of the State Statistics Service of Ukraine, reports of the Ministry of Finance of Ukraine, data of global and national information-analytical platforms, financial reports of IT companies, and expert assessments. The proposed approach to assessing and forecasting the level of competitiveness is tested on the data of 20 companies in the IT sector of Ukraine. The information base of the paper is the data of information-analytical portals and financial reports of IT companies for 2015–2019.

The above methodical approach to assessing and forecasting the level of competitiveness is tested on the data of 20 companies in the IT sector of Ukraine. The information base of the paper is the data of information-analytical portals and financial reports of IT companies for 2015–2019.

The purpose of the paper is to develop the theory and procedural guidelines for the formation of assessment and forecasting of the level of competitiveness of companies in the IT sector.

4. Results

The "post-virus world" as a global environment in which business will exist in the medium term will change, which will give rise to new priorities of business strategies due to the emergence of such trends.

Appearance of new sales channels. In order to reduce the negative pressure of quarantine barriers to normal economic activity, companies should develop alternative sales channels. We are talking about the sale of traditional products and services through online channels by digitizing business processes for the sale of products/services, or by using intermediary platforms. With the formation of new digital platforms, companies should shift sales efforts in B2C and B2B market segments to new channels. Going online will be a strategy for quick results.

Use of existing industrial facilities for the production of new goods. COVID-19 reduced demand for certain groups of goods and services, which led to underutilization of organizational-industrial infrastructure. At the same time, demand for other groups of goods remains high or grows asymmetrically. It is advisable to refocus the underutilized infrastructure for the production of goods and services to combat COVID-19, as well as to meet future changes in consumer demand.

Rapid introduction of innovations around new needs. In addition to balancing the product range, new customer needs create opportunities for innovation. In the face of crisis threats or significant changes in market structure, in addition to safeguards, companies need to focus on innovation that enables them to reap the benefits of emerging opportunities. It is important to inform about the Internet offers of companies and improve digital customer loyalty.

Development of industrial capacity to meet expanded demand. For companies from growing segments, it is advisable to expand their infrastructure to increase production capacity. The development of partnerships with other companies can increase industrial and logistics capacity in a crisis. To meet the needs in new infrastructure, it is advisable to cooperate with external partners in the framework of the sharing economy.

Constant focus on identifying new consumption habits that are being formed. Changes in consumption patterns caused by the coronavirus pandemic will continue in the post-quarantine period. Most sectors are refocusing on

new market realities in many countries around the world. It is difficult to determine which new habits will persist in the long run, but significant opportunities include moving from offline to online education, transforming health care, and increasing the use of digital sales channels. Companies must accelerate digital transformation, development of digital marketing tools, building partnerships through Internet platforms.

Using social networks to coordinate the activities of employees and partners. Thanks to remote work and a new set of coordination problems, companies are aware of the need to use social networks to coordinate the actions of employees and partners. A separate area is the initiation by companies of training and motivation of personnel to promote the products of a company on social networks.

Search for new sources of income. Following the end of the coronavirus pandemic, there is a high probability that many markets will shrink and demand will remain low on the part of consumers and businesses for a long time. As competition intensifies, search for new revenue opportunities will be critical to the sustainability of companies. Although specific strategies will depend on areas of activity or markets, new opportunities for all activities are created by building ecosystems that focus on partnerships, product innovation, development of digital channels (marketing, sales of products, learning about changing preferences and habits, etc.). To take on new markets, companies in both the manufacturing and services sectors need to develop products that reflect current needs.

Improving the level of training, skills and qualifications of the workforce in accordance with the needs of the new world. Restrictions on economic activity during the coronavirus pandemic forced all companies to reconsider almost every aspect of their activities: remote work, digital interaction/use of new technologies. This places before a company a challenge of ensuring that personnel acquire the necessary skills and increase their readiness to accept change. The speed of technological progress has created significant demands for training of the workforce, and post-crisis requirements will increase this need. In addition to the technical training of employees, it is necessary to carefully assess the skills and competencies that need to be focused on, invest in training and assess the impact of changes on the activities of a company. This will allow to increase productivity, support innovation, increase the sense of involvement of employees and their job satisfaction.

Given the cessation of a number of economic processes and weakening domestic demand related to measures to combat the COVID-19 pandemic, the priorities of support and development of SMEs in Ukraine should be identified.

Radical reduction of government intervention in the activities of economic entities, elimination of administrative barriers to doing business. Constant changes in legislation on SMEs, which establish new rules and requirements for micro, small and medium-sized businesses, affect the institutional weakness of SMEs, ignorance of how to act in accordance with the law, and create grounds for claims by state supervisory and control bodies. According to the State Regulatory Service of Ukraine (SRSU) (SRSU will continue to work on elimination of legal, administrative, economic and organizational barriers to business (2020)), in 2019 the introduction of state regulations was prevented, which provided for almost UAH 33.1 bln additional costs for business entities, by deciding to refuse to approve the relevant draft regulations (in 2018 — UAH 43.5 bln).

Systemic reduction of corruption. Insufficient integrity of separate officials, abuse of power, lack of critical attitude of business representatives to corruption and illegal material incentives as a tool to address issues, contribute to corruption and complicate its eradication. Some local government officials do not always properly perform the powers delegated to them, which creates grounds for corruption, and some actions of local government officials are seen as pressure on business. According to the corruption indicator in the "Report on the assessment of the implementation of state policy for the development of small and medium-sized enterprises in Ukraine, USAID CEU 2019", 44.6 % of SMEs considered corruption to be the main obstacle to doing business

(the program USAID Competitive Economy of Ukraine (CEU) receives concepts of grant projects from business associations (APS) (2021)).

Modernization of the tax system based on the introduction of rational tax innovations (replace the corporate income tax with withdrawn capital tax; expand the list of excisable goods in accordance with EU Directives), simplify tax administration, timely refund VAT and reduce the burden on the payroll by reducing the rates of single social security tax or reducing the personal income tax rate.

Improving access of SMEs to financing in the banking and non-banking sectors through simplification of borrowing and collateral requirements. SMEs require increasing the volume of financing through existing and new programs to replenish working capital, including for payment of labor/rent with a grace period of debt service of at least 60 days. SMEs that have lost more than 15 % of their sales require a special approach to determining the amount of interest on loans (or compensation from the state) and the ability to obtain loans without collateral. Free access to lending also provides simple procedures for obtaining a loan, including the speed of its obtaining (up to 48 hours from the date of request) using online access.

Expansion of capabilities, foreign economic activity of SMEs. The high level of uncertainty regarding the volume, terms and patterns of export recovery is related to the lack of long-term contracts for large amounts, so the risk of losing export potential increases (approximately 30 % of exports of Ukraine). In the face of new challenges, SMEs have partially lost the chains of international cooperation, which has affected their competitiveness in international markets, increased the need to preserve existing trading partners and find new markets. This is exacerbated by the lack of export credit and the lack of knowledge and skills to find partners through the placement of information on the proposals of a company in EEN (Helping companies innovate and grow internationally (2021)).

Increasing the level of digitalization of public services and entrepreneurial competencies of SMEs, increasing the volume of e-commerce. In the conditions of quarantine restrictions, impossibility of offline work of many areas of activity of SMEs and cooperation with authorities, there is a choice between business closure and its adaptation to new conditions through development of tools of remote online access (expansion of the list of public services, e-commerce development). Government support is required to effectively adapt to the forced wave of digitization (only 66 % have the opportunity of digitalization or repurposing), which depends on Internet coverage and the availability of specialized knowledge and competencies. State aid should be focused primarily on stimulating the introduction of remote business processes, as well as the use of digital tools to find new alternative markets. SMEs should systematically expand data analysis and information flow management tools.

The negative consequences of the "shock" of COVID-19 (in particular, 61 of the 68 largest companies in the IT sector (90 %) included in the S & P500 index (S&P500 (2020)) are characterized by negative market value dynamics) lead to the need to consider proactive adaptive strategy as a focus strategy in the cognitive competitiveness management of an IT company. The priority of the latter is explained by the fact that it allows to predict crisis processes in the early stages of their development before the moment of losses and damages. It is aimed at anticipating certain areas of industry development, allows to develop adequate preventive management decisions, which localize disturbances, prevent or minimize losses, to ensure a stable trajectory of the development of a company by increasing the speed of adaptive response and, as a consequence, to maintain a high level of competitiveness and business value.

Two requirements were taken into account when forming the system of diagnostic indicators of competitiveness of IT companies: high or average values of the probability of dominance of indicators reflecting the importance of indicators for the assessment of competitiveness (KC) from the point of view of experts, and the availability of

information on the indicators in open databases. The developed system of diagnostic indicators is given in Table 1.

Table 1. System of diagnostic indicators of competitiveness of an IT company

No.	Indicator group (area of evaluation)	Indicator (symbol)
1	Market activity level	Number of structural divisions of a company (x_1), number of industry solutions (areas of activity) (x_2)
2	Business reputation, level of customer trust and competitiveness of services	Number of countries of client companies (x_3), quality of projects (x_4)
3	Management quality	Degree of innovation of technologies used in the implementation of projects (x_5), quality of project management (x_6)
4	Quality of personnel management and intellectual capital	Personnel loyalty (x_7), number of specialists (x_8), number of technical specialists (x_9), number of newly employed specialists (x_{10})

Source: authors' research

Thus, as a result of using the proposed filter of the system of indicators, from the initial information space of attributes, a system of 10 diagnostic indicators was selected (Table 1), which includes the most informative indicators of competitiveness of IT companies from the point of view of experts. The module for assessing and analyzing the competitiveness of IT companies includes the formation of homogeneous groups of IT companies in terms of competitiveness (Figure 1).
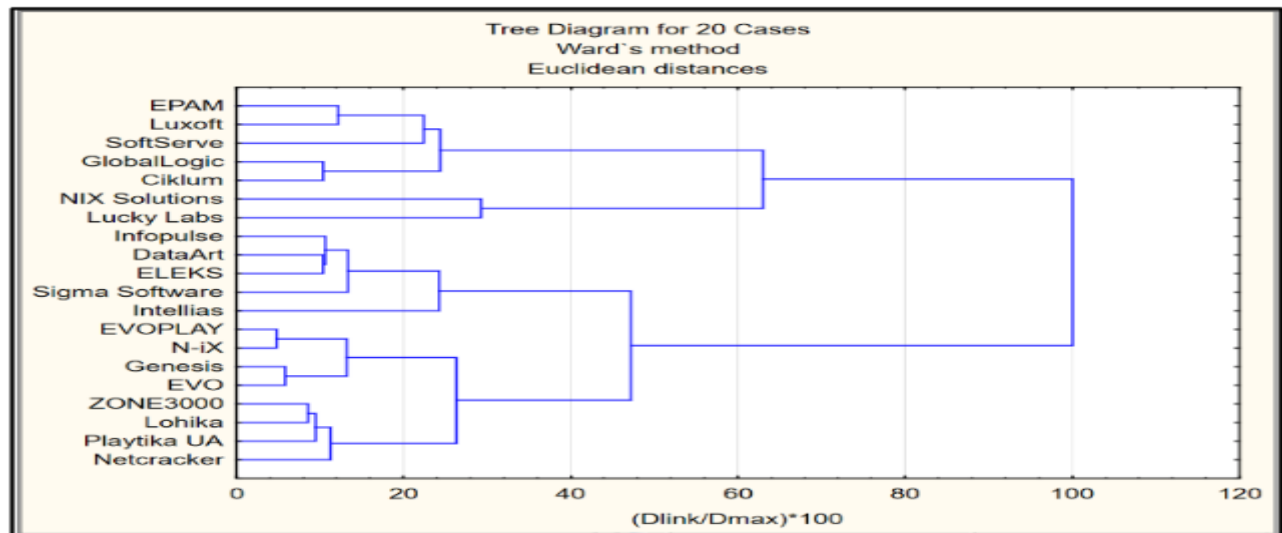
Fig. 1. Result of clustering based on standardized data using the Ward method as of 01.01.2016
Source: authors' research

The initial data for the clustering of IT companies are standardized values of the previously selected ten indicators (x_1, x_2, x_{10}), which describe the state of the environment of a company. In the first step of this stage, a decision is taken on the number of clusters into which it is advisable to divide the original population. Visualization of the data structure is easy to obtain using hierarchical agglomerative cluster analysis. The results of the application of clustering using the Ward method based on standardized initial data as of 01.01.2016 are given in Figure 1.

As can be seen from Figure 1, the population of companies under study is well divided into three groups. At the same time, we have one five-element cluster representing companies with a high level of competitiveness (EPAM, Luxoft, SoftServe, GlobalLogic, Ciklum), one two-element cluster representing companies with a low level of competitiveness (NIX Solutions, Lucky Labs) and the last cluster including all other companies with an average level of competitiveness.

Similar results were obtained for all other eight study periods from 01.07.2016 through 01.01.2020. The results are given in Annex E. Since the obvious division into three clusters using hierarchical methods was confirmed for all study periods, it is the division into three clusters that was used in k-means clustering. Summary results of k-means clustering are given in Table 2.

Table 2. Clustering results

No.	Name	01.16	07.16	01.17	07.17	01.18	07.18	01.19	07.19	01.20
1	EPAM	3	3	3	3	3	3	3	3	3
2	SoftServe	3	3	3	3	3	3	3	3	3
3	GlobalLogic	3	3	3	3	3	3	3	3	3
4	Luxoft	3	3	3	3	3	3	3	3	3
5	Ciklum	3	3	3	3	3	3	3	3	3
6	NIX Solutions	1	1	1	1	1	1	1	1	1
7	Infopulse	2	2	2	2	3	3	2	2	2
8	DataArt	2	3	2	2	3	2	2	2	2
9	EVOPLAY	2	2	2	2	2	2	2	2	2
10	Intellias	2	2	2	2	2	2	2	2	2
11	ZONE3000	2	2	2	2	2	2	2	2	2
12	ELEKS	2	2	2	2	2	2	2	2	2
13	Netcracker	2	2	2	2	2	2	2	2	2
14	Genesis	2	2	2	2	2	2	2	2	2
15	Sigma Software	2	2	2	2	2	2	2	2	2
16	Lohika	2	2	2	2	2	2	2	2	2
17	EVO	2	2	2	2	2	2	2	2	2
18	N-iX	2	2	2	2	2	2	2	2	2
19	Lucky Labs	1	1	1	1	1	1	1	1	1
20	Playtika UA	2	2	2	2	2	2	2	2	2

Source: authors' research

The data in Table 2 can be interpreted as follows. Cluster 1 is a cluster of companies with a low level of competitiveness, cluster 2 — with a medium level of competitiveness, and cluster 3 — with a high level of competitiveness.
The composition of the first cluster did not change over time. Only two companies were permanently included in this group: NIX Solutions and Lucky Labs. The composition of cluster 3 was also unchanged for three periods: 01.01.2016, from 01.01.2017 through 01.07.2017 and from 01.01.2019 through 01.01.2020. As of January 1, 2018, two more companies joined the five companies of this group (ERAM, Luxoft, SoftSeive, GlobalLogic, Ciklum): Infopulse and DataArt, as of 01.07.2016 - only DataArt, as of 01.07.2018 - only Infopulse. Similar results were obtained when using the Ward method, which indicates the stability of the obtained clustering results.

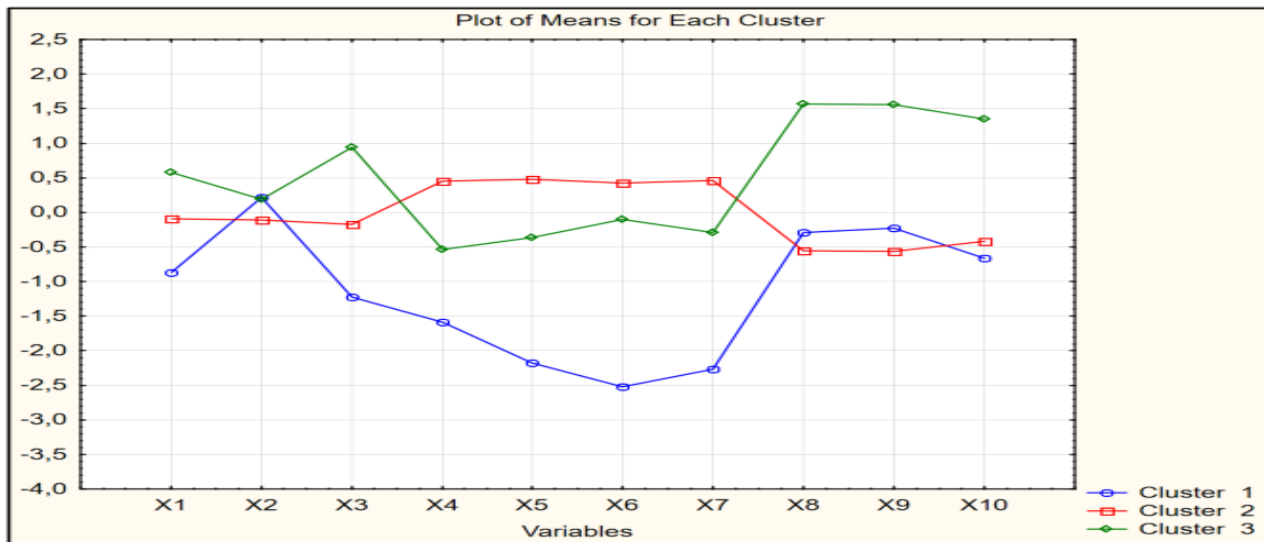The average values of the initial indicators for each of the clusters as of 01.01.2016 are given in Figure 2.

Fig. 2. Average values of the initial indicators for each of the clusters as of 01.01.2016
Source: authors' research

The distribution of means of indicators by clusters remains practically unchanged for all nine study periods. This gives reason to talk about the stability of the obtained results. As can be seen from Figure 2, the group of companies with a low level of KC (cluster 1) has the lowest values for the following indicators: x_1 — number of structural divisions of a company; x_3 — number of countries of client companies; x_4 — quality of projects; x_5 — level of innovation of technologies used in the implementation of projects; x_6 — quality of project management; x_7 — personnel loyalty; x_{10} — number of newly employed specialists. That is, these companies lag behind by all four general factors: market activity, business reputation, quality of management and quality of personnel management.

The group of companies with a high level of KC (cluster 3) has the highest values for the following indicators: x_1 — number of structural divisions of a company; x_2 — number of industry solutions (areas of activity); x_3 — number of countries of client companies; x_8 — number of specialists; x_9 — number of technical specialists; x_{10} — number of newly employed specialists. That is, these companies occupy leading positions in the IT market of Ukraine due to high market activity, fairly high business reputation and competitiveness of services, as well as high quality of personnel management and intellectual capital.

The group of companies with an average level of KC (cluster 2) is characterized by the highest level of indicators x_4 — quality of projects; x_5 - level of innovation of technologies used in the implementation of projects; x_6 — quality of project management; x_7 — personnel loyalty, which indicates the high potential of KC development for these companies.

We consider the results of the construction of a fuzzy membership function of the competitiveness class of the Mamdani algorithm. The input data for construction of the model are the values of the initial indicators, which form the local integrated assessments of competitiveness and the results of clustering presented in Table 2. Cluster

1 contains two companies (numbers 6 and 19) with a low level of competitiveness, cluster 2 — companies with a high level of KC (numbers 1–5), and cluster 3 — companies with an average level of competitiveness (numbers 7–18 and 20). MATLAB APP is used to construct these membership functions.

Table 3 shows the values obtained for companies and reflects the actual cluster distribution and the distribution found using the Mamdani algorithm, as of 01.01.2020.

Table 3. Final values for companies and distribution by clusters as of 01.01.2020

No.	Company	Membership value	Original cluster	Mamdani algorithm cluster
Cluster 1				
1	NIX Solutions	0.0264	17	1
2	Lucky Labs	0.0264	1	1
Cluster 2				
3	EPAM	0.282	2	2
4	SoftServe	0.225	2	2
5	GlobalLogic	0.225	2	2
6	Luxoft	0.304	2	2
7	Ciklum	0.5	2	3
Cluster 3				
8	Infopulse	0.752	3	3
9	DataArt	0.752	3	3
10	EVOPLAY	0.722	3	3
11	Intellias	0.763	3	3
12	ZONE3000	0.703	3	3
13	ELEKS	0.763	3	3
14	Netcracker	0.500	3	3
15	Genesis	0.813	3	3
16	Sigma Software	0.784	3	3
17	Lohika	0.752	3	3
18	EVO	0.701	3	3
19	N-iX	0.784	3	3
20	Playtika UA	0.774	3	3

Source: authors' research

As can be seen from Table 3, the results of clustering coincide by 95 %. Ciklum tends to migrate to a cluster of companies with an average level of competitiveness. This is due to a significant slowdown in the growth rate of the company (by 25 % over the past five years). The implementation of this model was carried out using EViews APP. Among the three types of models: a regular model based on panel data, a model with fixed effects and a model with random effects, the model with fixed effects has the highest quality. The values of the fixed effect are given in Figure 3.
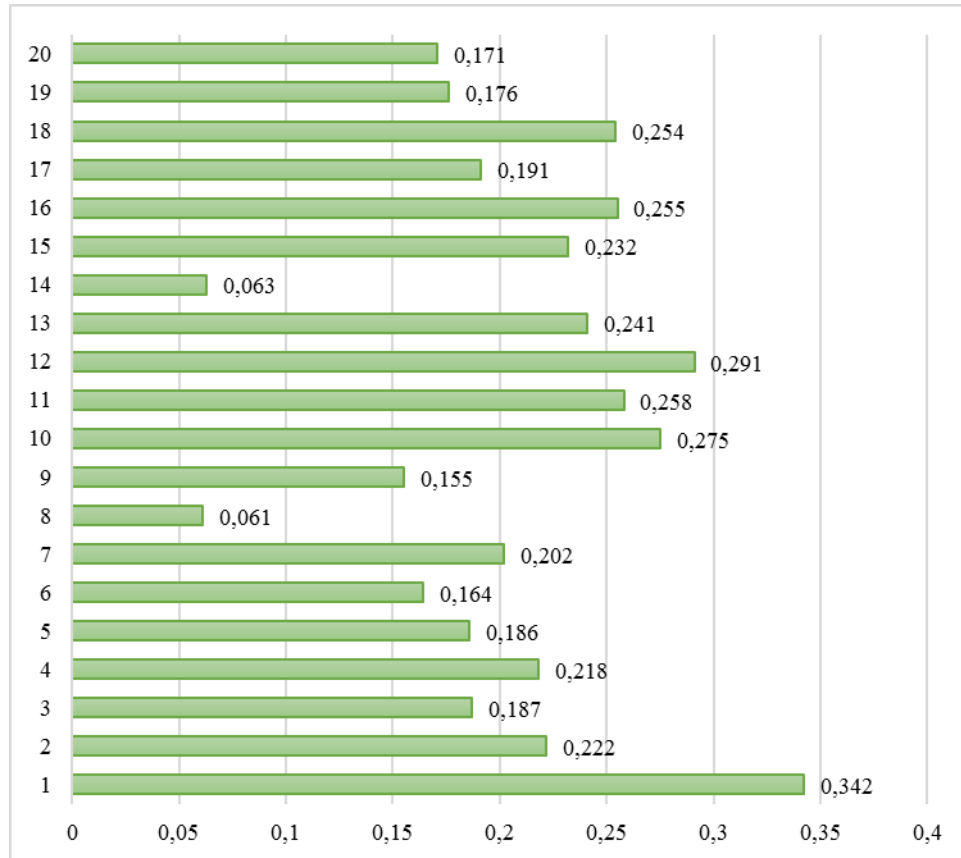
Fig. 3. Fixed effect values
Source: authors' research

As can be seen from Figure 3, a model with a fixed effect is adequate by the values of the coefficient of determination and the adjusted coefficient of determination (0.9881 and 0.9864, respectively). They are close to 1, which indicates that more than 98 % of the variability of the dependent variable is explained by the built model. We can also note the high value of Student's t-statistic (6.18), which indicates the statistical significance of the influence of the lag variable. The value of Durbin-Watson statistic is close to 2 (1.959) and indicates the absence of autocorrelation of model errors.

When using Fisher's test to check the statistical significance of the parameters of the intersection (location) in the model, the null hypothesis was rejected and the H1 hypothesis was accepted, $\mu_i \neq \mu_j$ which corresponds to the model with fixed effects, as the calculated value of F = 3.798 exceeds the tabular one of 1.65. According to Breusch-Pagan test, the calculated value of LM statistics is equal to 6.357, which exceeds the value of 3.84. Therefore, we can conclude that we should prefer a model with a random effect. According to Hausman test, the calculated value of H statistics is equal to 45.153, which significantly exceeds the tabular value of Pearson's criterion equal to 3.84, so we accept the H1 hypothesis that the difference between the values of models with random and fixed effects is significant, and the values of a model with fixed effects are sound, i.e., the choice is made in favor of a model with a fixed effect.

Thus, at the last seventh stage of the proposed methodical approach to forecast the level of KC of IT companies a model with fixed effects is used. The forecast values of the integrated assessment of the level of competitiveness of IT companies obtained using this model are given in Table 4.

Table 4. Forecast values obtained using a model with fixed effects

No.	Company	07.01.20	01.01.21	01.07.21	01.01.22	01.07.22	01.01.23
1	EPAM	0.6663	0.6613	0.6589	0.6577	0.6572	0.6569
2	SoftServe	0.5486	0.5539	0.5564	0.5576	0.5582	0.5585
3	GlobalLogic	0.2961	0.2043	0.1604	0.1394	0.1293	0.1245
4	Luxoft	0.4872	0.4651	0.4545	0.4495	0.4471	0.4459
5	Ciklum	0.4575	0.4737	0.4814	0.4851	0.4869	0.4877
6	NIX Solutions	0.2516	0.3115	0.3401	0.3538	0.3604	0.3635
7	Infopulse	0.4549	0.4715	0.4794	0.4832	0.4851	0.4859
8	DataArt	0.3986	0.3644	0.3480	0.3402	0.3364	0.3347
9	EVOPLAY	0.3510	0.3388	0.3330	0.3302	0.3289	0.3283
10	Intellias	0.4553	0.4404	0.4333	0.4299	0.4283	0.4275
11	ZONE3000	0.3471	0.3533	0.3562	0.3577	0.3583	0.3587
12	ELEKS	0.4175	0.4175	0.4174	0.4174	0.4174	0.4174
13	Netcracker	0.3388	0.3480	0.3523	0.3544	0.3554	0.3559
14	Genesis	0.3400	0.3269	0.3206	0.3176	0.3162	0.3155
15	Sigma Software	0.3985	0.3926	0.3897	0.3884	0.3877	0.3874
16	Lohika	0.2326	0.1728	0.1442	0.1305	0.1239	0.1208
17	EVO	0.3029	0.2996	0.2980	0.2972	0.2969	0.2967
18	N-iX	0.4578	0.4942	0.5115	0.5199	0.5238	0.5258
19	Lucky Labs	0.3118	0.4073	0.4531	0.4750	0.4855	0.4905
20	Playtika UA	0.3823	0.4243	0.4444	0.540	0.4586	0.4608

Source: authors' research

As can be seen from Table 4, in the medium term, companies such as EPAM, SoftServe, Luxoft and Ciklum will maintain their leading positions in the IT industry. However, EPAM and Luxoft are characterized by negative dynamics of changes in the integrated indicator of the level of competitiveness, which indicates the need to adapt the strategy of managing the competitiveness of these companies. The highest rates of development are demonstrated by Lucky Labs, NIX Solutions, and Playtika UA. Besides, we should pay attention to Infopulse, which tends to migrate to the cluster of companies with a high level of development (Table 2) and demonstrates the positive dynamics of changes in the integrated indicator in the forecast period (Table 4). However, the growth rate of the company is not sufficient to ensure a stable competitive position in the cluster of leading companies.

Thus, the conducted studies allow us to draw the following conclusions:
- The use of the proposed algorithm of the filter of the system of indicators of KC of IT-companies based on the methods of expert analysis allowed to significantly reduce the dimensionality of the original information space of attributes without losing significant information. It is based on the input system of indicators, which includes 10 most informative variables for monitoring and assessment of the level of KC of IT-companies;
- A system of general and local (by individual components) integrated indicators of KC of IT-companies was developed, which demonstrated a significant differentiation of IT companies by competitiveness (the coefficient of variation of the study population is more than 30 %). The companies, which were characterized by the highest level of competitiveness during the study period, include EPAM, Luxoft and SoftServe;
- Clusters of companies homogeneous by the level of competitiveness were created. For the companies differentiated management strategies can be developed. And companies were selected, which tend to migrate to a

group of companies with higher or lower competitive positions. It should be noted that there is a small gap between the levels of competitiveness of leading companies and the companies of the "second cluster", which indicates a high intensity of competition in the IT sector;

- The models of panel data on the level of competitiveness of IT companies were developed. The obtained results allowed to identify ERAM and Luxoft as the objects for further studies. The forecast dynamics of their development is characterized by negative trends of change of level KC. Although these companies remain in the cluster of companies with a high level of KC, their position in the cluster is worsening. The state of Infopulse, which tends to migrate to the cluster of companies with a high level of development and demonstrates the positive dynamics of changes in the integrated indicator in the forecast period, will be considered in more detail. However, the growth rate of the company is not sufficient to form a sustainable trajectory of development and move into the cluster of leading companies.

5. Discussion

The largest risks for Ukrainian SMEs in the conditions of quarantine are: shutdown, liquidity deficit, reduction of consumer demand, disruption of value and supply chains, loss of domestic market, uncertainty in foreign markets, as well as unpreparedness of the regulatory environment of Ukraine for stimulation of the dynamic development of business potential. The implementation of business potential depends on the rapid modernization and adaptation of state support policy. Strengthening efforts of legislative and executive bodies will reduce risks to SME development.

State policy reformatting should include:
1) Implementation of an anti-crisis action plan to support entrepreneurship in the conditions of quarantine measures and in the period of economic recovery (Danylyshyn (2020));
2) Reduction of the regulatory burden and development of a package of measures focused on preserving markets for SMEs in the conditions of restrictions (Nadiia & Anna (2021));
3) Development of measures to prevent corruption abuses and discrimination of economic entities during the quarantine (Åslund (2020));
4) Accelerated simplification of tax administration (Rozanova et. al (2020));
5) Improved access to financing (Kyrychko et. al (2020));
6) Creation of export stimulation infrastructure (Kyrylov et. al (2020));
7) Extension of digital transformations, expansion of digital tools for remote financial and economic operations (Ashraf (2020)).

Conclusions

Considering the importance of improving the business climate for the implementation of business potential in an economic crisis, it is necessary to further study the existing obstacles to the development of entrepreneurship in Ukraine in order to identify priorities for overcoming them for stimulation of sustainable economic development.

The expediency of applying the level of development method to build an integrated assessment of the level of competitiveness of IT companies is substantiated. Integrated assessments were built, both for the whole system of indicators and for individual areas, which allowed to identify "critical" subsystems, the growth of threats in which leads to the loss of current market positions of IT companies.

Based on hierarchical agglomerative and iterative methods of cluster analysis, clusters of companies homogeneous in terms of competitiveness were identified. Comparison of the results of ranking of objects based on the level of development method and cluster analysis allowed to determine the intensity of competition in the

IT industry, the gap in the levels of competitiveness of companies with high and low competitive positions, to determine the propensity of enterprises to migrate from cluster to cluster. With the help of the methods of fuzzy logic theory, models of competitiveness cluster recognition were developed, which confirmed the stability of the results of cluster analysis and were used to identify the competitiveness cluster in the forecast period in the framework of proactive management.

The models of panel data on KC of IT companies are built, on the basis of which the exploratory spatial-dynamic forecast of KC level is developed taking into account both dynamic changes in the level of both a company itself and positions of competing companies. Comparison of the current and forecast level of competitiveness allowed to assess the stability of competitive positions of companies, to identify IT companies, for which it is advisable to develop proactive strategies aimed at reversing the negative trends, which are being formed based on forecast data according to the adopted strategy of KC management.

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Vladislav FEDORENKO, Doctor of Law, Professor, Director of the Research Center for Forensic Examination on Intellectual Property of the Ministry of Justice of Ukraine
ORCID ID: orcid.org/0000-0001-5902-1226

Natalia FILIPENKO, PhD in Law, Associate Professor, Associate Professor of Law, Zhukovsky National Aerospace University "Kharkiv Aviation Institute"
ORCID ID: orcid.org/0000-0001-9469-3650

Inesa SHUMILO, Candidate of Juridical Sciences, Associate Professor, International Private Law and Comparative Law Department Yaroslav Mudryi National Law University
ORCID ID: orcid.org/0000-0002-2123-7272

Volodymyr NESTEROVYCH, Doctor of Law, Associate Professor, Head of the Department of State-Legal Disciplines, Lugansk State University of Internal Affairs named after E.O. Didorenko
ORCID ID: orcid.org/0000-0003-2614-0426

Svitlana NISCHYMNA, Doctor of Sciences (Law), Professor, Head of the Department of Administrative, Civil and Commercial Law and Process, Academy of the State Penitentiary Service
ORCID ID: orcid.org/0000-0001-7424-7888

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THE GROWTH OF THE COUNTRY'S ECONOMIC SECURITY LEVEL BASED ON THE INVESTMENT INFRASTRUCTURE DEVELOPMENT PROJECTS

Lidiia Karpenko [1]*, Mykola Izha [2], Iryna Chunytska [3], Andrii Maiev [4], Kateryna Hunko [5]

[1,2,4] Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine, Genuezka, 22, 65009, Odessa, Ukraine
[3,5] University of the State Fiscal Service of Ukraine, 31, Universytetska str., 08201 Irpin, Ukraine

E-mails: [1]* karpenko_l@ukr.net (Corresponding author)

Abstract. The article is dedicated to the question of providing investment development of the national infrastructure and adherence to the economic security level growth conditions. The authors determined the role of investments and the project orders in the development of the national infrastructure and formation of the national reforms investment support policy. While conducting the research, they built a model of investment interest simulation and scenarios of investors' behavior, and analyzed the application of Monte Carlo technique regarding the investment projects. They developed a procedure model of Monte Carlo technique use for assessment of the investment projects at the given level of economic security. They generalized the methodological approaches to the practical application of Monte Carlo technique and method of historic simulations in assessment and minimizing the risks of the investment projects, which are carried out in the infrastructure industry of the country's economy. The researchers studied the peculiarities of application of Monte Carlo technique and simulations method during the assessment and minimizing the risks of investment projects in coordinates of economic security. They offered conceptual foundations of probability and statistical assessment of the investment projects risks concerning the country's infrastructure development in the given interval of economic security. They determined and provided a step-by-step order for calculating the expected cost NVP of investment projects within the national economic space and coordinates of economic security.

1. Introduction

The development of the country's infrastructure is one of the most important priorities for modernization of the modern economy and provision of economic security as the infrastructure contributes to the formation of the basis for effective implementation of the economic processes and connectivity between business entities. Infrastructure has always been of strategic importance not only for the regions but also the state in general, providing the reproductive process in all spheres of society's living environment and setting the prerequisites and foundations for the development of the economic activity, focused at the reasonable transformation of the economic environment and growth of the national economic security level. As of today, the development of the country's infrastructure has international importance due to the modernity of the globalization and European integration processes.

The development of the country's modern infrastructure and its economic security is affected by many factors, among which are socio-economic and ecological, global and political processes. At the same time, investments are still regarded as the foundation of the country's infrastructure development. Upon their nature, they can have different directness and area of application. Nevertheless, the non-systemic and inconsistent financing of the development of the national infrastructure, dated institutional provision of the national investment policy, and imperfection of the tools for disclosing the infrastructure potential, fluctuations in the volume and speed of investments attraction, make it necessary to actualize the theoretical and methodological framework and practical frame on investment provision of development of the country's infrastructure and advancement of the economic security level. The urgency of this problem and the dynamic changes of the investment prerequisites of the country's infrastructure development require constant research of theoretical and applied foundations of investment provision of sustainable growth.

2. Literature review

The shortening of differentiation at the levels of the country's social and economic development, activation of investment activity, promotion of efficient funds handling, strengthening of the national economy, and alignment of economic development priorities with the corresponding national priorities, raise the need for the definition of the categorical system of infrastructure's investment development, and provision of economic security.
Such researchers as (Ackert, Deaves, 2010; Chambers et. al., 1982) carry out a profound analysis of modern notional loading of the term of infrastructure and its security parameters at different levels and stages of social production. When analyzing modern approaches to the definition and classification of infrastructure, they mention that their main disadvantage is that to identify its elements, it is necessary to consider as a system only the country's economy in general.

A range of modern researchers (Potts, 2002; Wilmott, 2009) concretize the economic nature of infrastructure and expediency of investing in it, and come to a conclusion that its most significant feature and factor of its security under conditions of the market economy is the role in the provision of general prerequisites of the reproduction process and general conditions of growth of public production and, hence, economic progress at an expense of implementation of the national investment projects.

When describing modern infrastructure, many researchers (Alkaraan and Northcott, 2006; Arnold, 2010; Campell, 2003) mention versatility of the components, which are included in its structure and carry out specific, inherent only to them, functions, which in complex provide the implementation of the objective function of the infrastructure and form stable long-term security. At the same time, an especially important place is given to the need for the provision of the objective-directedness of the infrastructure operation and close interdependence of its elements, performing diverse functions, which is an obligatory condition of its efficient operation and implementation of socio-economic and investment processes at a scale of the country.

Gitman and Joehnk (2008) consider the national infrastructure to have three main contours, put into each other – the infrastructure of sense of life, the infrastructure of life support, and infrastructure of development. Along with this, the infrastructure of development falls into five main components: transport, customs, informational (connection), financial, and commercial. Each of them is characterized by the economic and investment security aspects.

At a modern stage, the researchers-economists more often consider it as an integrant factor of economic development (Barnett et al., 2015; Jackson, 2010; Mazzanti et al., 2020), accordingly, at the national level of provision of "efficient" infrastructure formation, required for both the advancement of the economy of the country with a low level of development and provision of the national high level of economic security.

3. Research Methodology and Data

We will form the methodological concepts of the national infrastructure investment development and adherence to the conditions of the economic security level growth based on the following principles and approaches, namely: 1) the concept of investment provision of infrastructure development is directed at formation of the national investment policy, which – at an expense of attraction and use of investments (including) – provides for the development of the country's general infrastructure, based on the advancement of its investment security for investment attractiveness improvement; 2) the concept of concessionary investment is a long-term capital investment in the objects of the national form of management, which upon the concessionary agreement expiry fall under the ownership of the state; the problematics of efficiency determination from concessionary investment; contradiction in calculating the sizes of concessionary payments according to the relevant normative-legal acts; the procedure of decrease in the size of the concessionary payment for a sum of put amortization costs for renovation of the main funds, received in concession; one hasn't determined the intervals for the expert estimation of the integral property complexes; 3) crowdfunding financing and investment of the national projects. To hold crowdfunding, one uses the corresponding electronic resources, including the application of specializes servers.

Through the use of Internet resources, the crowdfunding technology makes it possible to significantly expand the scope of people who want to take part in the financing of the national investment projects. Such technology makes it possible to remove a big number of intermediaries, participating in the regular project financing schemes. The crowdfunding platform acts as the only intermediary; 4) the conceptual approach to the provision of investment support for the development of the country's infrastructure, which provides for the conduction of the five-stage research according to the given hypotheses, concerning the interdependence between the socio-economic condition of the country and the development of its infrastructure, investment attractiveness, and the investment policy (Wickson at al 2006). Such a conceptual approach to investment provision of the national infrastructure development is the foundation of the infrastructure complexes' capability to self-development based on a specific level of socio-economic development.

4. Results

Effective development of the country's infrastructure depends on the application of the latest approaches to the determination, formation, and attraction of investments, which determine success in achieving stable social and economic development of the country, which, in its turn, makes the prerequisites for the improvement of the investment national attractiveness, and activation of investment activity. The increase in performance of investment activity is one of the main prerequisites for stabilization and development of the national economy. Nevertheless, under the condition of uncertainty, business entities face the deficit of investment resources, threatening the level of economic security. When building the concept for the investment provision of the country's infrastructure development, the risk assessment appears to be an extremely important component for

developing the applied methodological regulations on control and prevention of the cases of economic security conditions infringement. We think it makes sense to consider the quantitative risk assessment of the investment projects, regarding the country's infrastructure development, through the prism of the theoretically-practical application of the simulation methods, grounding on Monte Carlo simulation analysis and resides in the multiple perceptions of the course of computation of the efficiency index of the investment project, according to the adopted efficiency assessment method (Yin 2009). Herewith, in most cases, it is clear current value and internal rate of return. The conditional model of investment interest simulation and investors' behavior scenarios are given in Fig. 1.
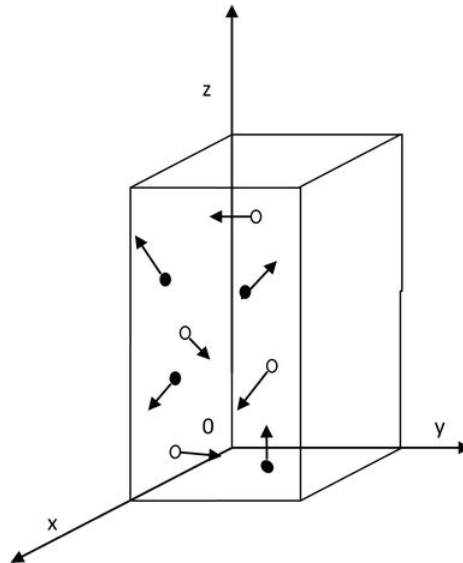

Figure 1. The conditional graphic model of investment interests simulation and investors' behavior scenarios
Source: compiled by the author according to the data (Fabozzi 1999)

This is precisely why when studying the peculiarities of Monte Carlo simulation method application during the assessment of the risks of the investment projects, regarding the development of the country's infrastructure and control over the level of economic security, one faces a need to clearly determine the process and principles of its conduction, which will make it possible to avoid the conduction of an exhaustive review of all possible options in the future, but to use a representative sample of scenarios. Thus, when managing the risks, the simulation models can provide important sources of information sources for the organization both in terms of determining the new investment strategies and adoption of new corporate strategies (Lewis, 1999). The process of planning a strategy or optimization of the latter at the organizational level grounds on the analysis of internal and external risk factors as well as the possibility of their achievement.

The algorithm of Monte Carlo method grounds on the following steps (Fishman 1996):
Step 1: Development of a parametric model, $y = f(x_1, x_2, ..., x_q)$;
Step 2: Generation of a random input set of data, $x_{i1}, x_{i2}, ..., x_{iq}$;
Step 3: Effective calculations and memorization of results as y_i;
Step 4: Repetition of Step 2 and Step 3 for $i = 1$ to m $(m \geq 1000)$;
Step 5: Analysis of the results with the use of histograms, intervals, other statistical indicators, received results of the simulation, etc.
Thus, the analysis of the best scientific practices on the implementation of the Monte Carlo method in the analysis of risks and prevention of reduction in the economic security level shows that many issues still remain unsolved in practice, which encourages to continue the research and scientific substantiation with the identification of

advantages and disadvantages of the toolset of quantitative analysis of risks of the investment projects for the development of the country's infrastructure as well as its subsequence. When studying the peculiarities of application of Monte Carlo simulation method during the evaluation of the investment projects' risks, regarding the development of the country's infrastructure, it is necessary to clearly determine the process and principles of its conduction (Namey et. al., 2008). In particular, a special presentation of the risk analysis process with the use of the Monte Carlo method with the reflection of risk expression and calculation is given in Figure 2.
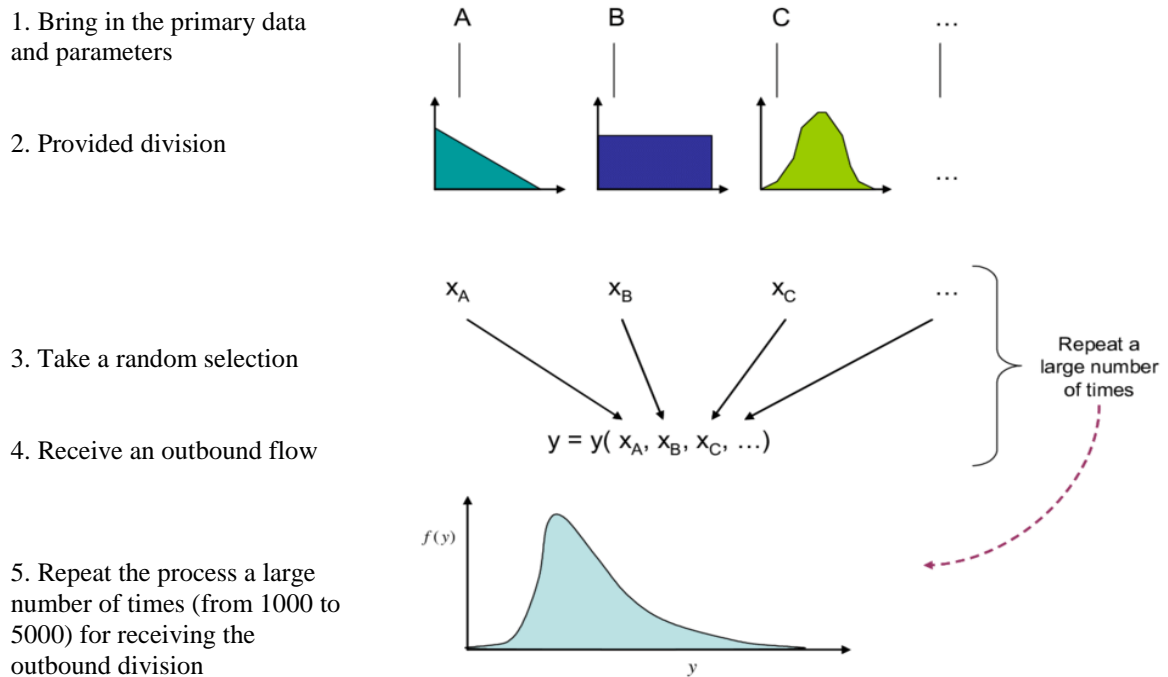
Figure 2. Process of Monte Carlo simulation
Source: compiled by the author according to the data (Kroese et. al., 2011)

The corresponding distributions and correlations (interdependencies) are related to a huge base of data in the mathematical model. Herewith, the simulation is carried out through the use of a random number generator. In the result of contraction of probabilities, one receives cumulative graphs (often, the sensitivity analysis tools are included), and, therefore, the probabilities of the desired results can be assessed or calculated through their analysis. The Monte Carlo method is one of many uncertainty spreading analysis methods, in which the objective resides in the determination of the influence of the random variables, absence of knowledge, or errors on the sensitivity, performance, and reliability of a system that undergoes simulation. Thus, one conducts the choice of such a distribution for inputs that best matches already existing data or the one, which better reflects the actual information. Apart from that, one distinguishes the stochastic model (Fig. 3) and the deterministic model (Fig. 4).
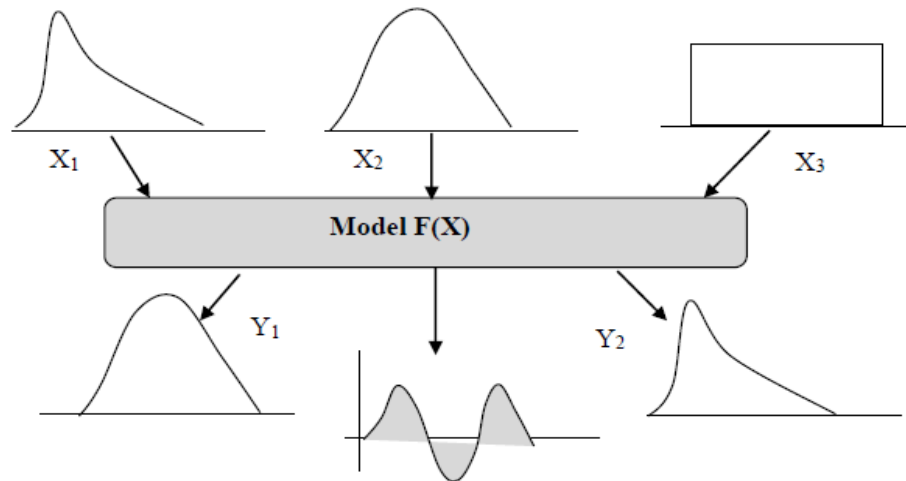
Figure 3. The main modeling principle upon the Monte Carlo method
Source: compiled by the author according to the data (Robert and Casella 2004)
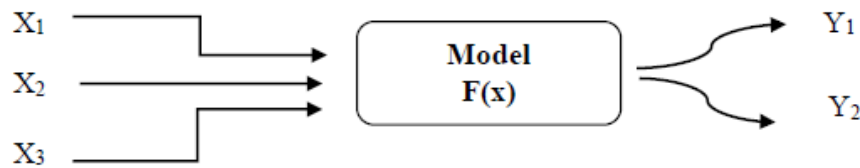
Figure 4. The principles of the deterministic model upon the Monte Carlo method
Source: compiled by the authors according to the data (Robert and Casella 2004)

The fundamental difference between them resides in the facts that the parametric deterministic model establishes a set of input variables, reporting the set of output variables.

The uncertainty spreading, input random variables (described by a random distribution), and the result in the stochastic model will be random, and, as a rule, after the normal distribution. Monte Carlo simulation is a statistical method, combining the sensitivity analysis and probability distribution of explanatory variables (identified during the sensitivity analysis). We offer to present a simulation cycle in the Monte Carlo method using the following steps (Fig. 5).

When building a financial model, one should necessarily identify all significant variables first, which affect the risk of the national investment project. The number and the choice of variables depend on the type of investment and the range of conducted analyses (Kroese et. al., 2011). One often marks down as the random variables: the discount rate, the length of a life cycle, return on sales and operating expenses. This group should include the majority of variables as each consideration of a factor as a deterministic (outstanding) value is a simplification of the realm. As a consequence, at this stage, using a set of equations, describing the identified variables, one can build a single general model, serving for calculation of the measure of the investment efficiency (for example, the indicator *NPV*).

Within the framework of the second step, each explanatory variable is given probability distribution. In the case of a simulation, one faces great difficulties while determining the distribution of undefined variables and their corresponding probability. While conducting hypothetical distributions, one can use continuous distributions: normal distribution – the setting of a specific distribution requires the knowledge of the expected value and

standard deviation of the distribution; uniform distribution – the establishment of a specific distribution requires awareness of the minimum and maximum distribution costs.
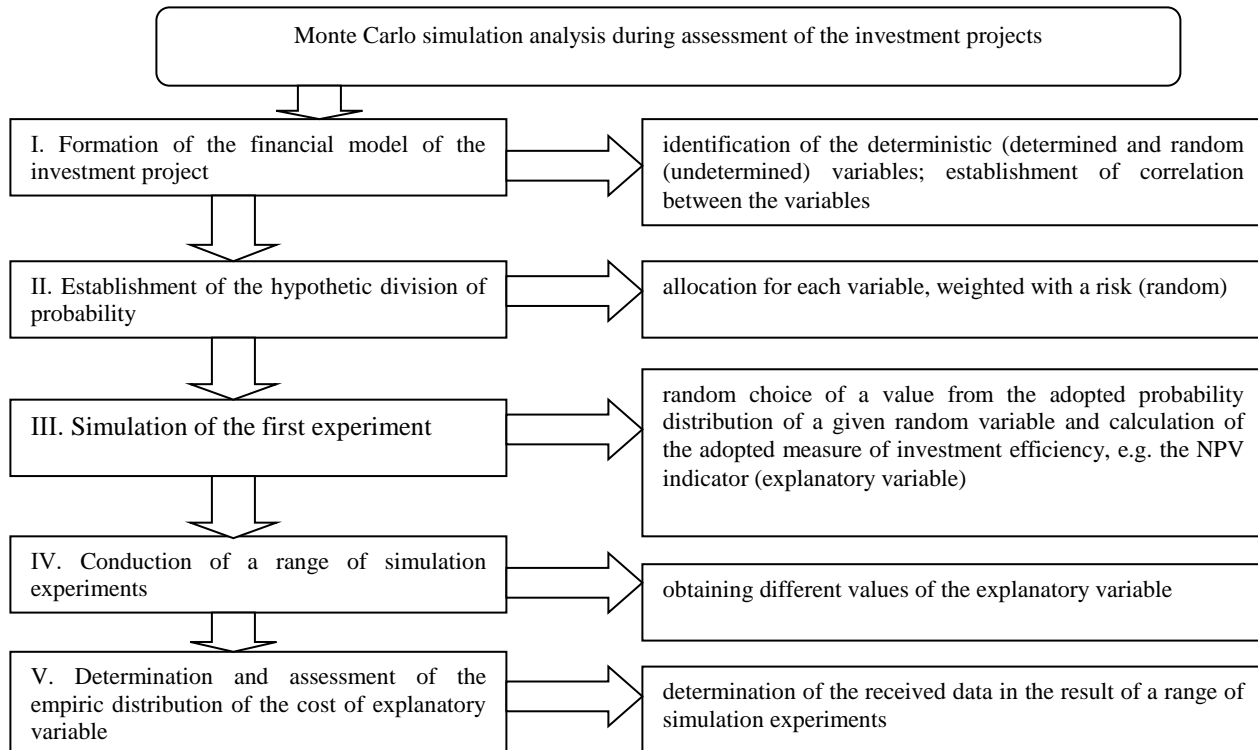
Monte Carlo simulation analysis during assessment of the investment projects	
I. Formation of the financial model of the investment project	identification of the deterministic (determined and random (undetermined) variables; establishment of correlation between the variables
II. Establishment of the hypothetic division of probability	allocation for each variable, weighted with a risk (random)
III. Simulation of the first experiment	random choice of a value from the adopted probability distribution of a given random variable and calculation of the adopted measure of investment efficiency, e.g. the NPV indicator (explanatory variable)
IV. Conduction of a range of simulation experiments	obtaining different values of the explanatory variable
V. Determination and assessment of the empiric distribution of the cost of explanatory variable	determination of the received data in the result of a range of simulation experiments

Figure 5. The procedure of the use of the Monte Carlo method for assessment of risks of the national investment projects at a given level of economic security
Source: designed by the authors

At the third stage, in one experiment, a random number is generated for each variable with the help of a computer program, which can be interpreted as an implementation, coming out of the accepted distribution. The selected values form the foundation for calculation of the flows of money, based on which, one calculates the *NPV* and/or *IRR* indicators. In contrast to the sensitivity analysis method, considering the explanatory variables separately, Monte Carlo simulation reviews these variables cumulatively, considering the relationship between them. The underestimation or ignoring of the correlation data reduces the weight of the obtained results as, in such a case, the analysis covers many unrealistic variants of the project, which, in its turn, can lead to incorrect decisions (Lumby, 1991).

At the fourth stage, the actions of the third stage are repeated many times (even several thousand times). Herewith, the accuracy of the result increases with the number of experiments.
In the lines of the fifth stage, one builds the distribution of probability *NPV* and/or *IRR* and calculates their expected values and standard deviations. The final result of Monte Carlo simulation is the calculation of the probability of obtaining a positive *NPV* and/or the internal rate of return *IRR*, the value of which is greater than the discount rate.

Thus, the generalization of conclusions concerning the practicability of application of Monte Carlo method and the method of historic simulations in assessment and minimizing of risks is formed in Table 1.

Table 1. The peculiarities of application of the Monte Carlo method of simulations during the assessment and minimizing of risks of the investment projects in the coordinates of economic security

Advantages	Disadvantages
Determines the probability of an event in tasks, where the complexity of calculations increases to the dimension of the task exponentially. High calculation accuracy. Provides a complete portfolio estimate. Application of separate empirical and theoretical distribution functions allows taking into account the effects of asymmetry and "correlation breakdown" under market shocks. Does not require significant amounts of empirical data.	The simplicity and efficiency of the method are detrimental to its accuracy. Due to the complexity and number of calculations is significantly dependent on technical equipment, high qualification of analysts, significant time consumption. High risk of models inadequacy. Low visibility and high complexity of interpretation of the obtained assessment results.
Provides probabilical results, which not only show what can happen but also reveal the level of occurrence possibility for a case or event. Provides a graphic representation of the results. Provides a vulnerability analysis. Analyzes scenarios. Investigates the dependencies of the source data. Models the interconnected relationships between input variables.	Translates risk analysis by building possible result models, changing different values of distribution plausibility. Calculates results from the likelihood function using different sets of values. Depending on the number of unknown and established for them, groups can perform tens of thousands of calculations.
It does not require any technical equipment. Intuitive ease of use and clarity. Lack of additional theoretical simplifications and assumptions, allows you to take into account the effects of "fat tails," asymmetries and "correlation breakdown" under market shocks. Lack of model risk. The simplicity of complete portfolio assessment. The empirical distribution parameters can be used to build parametric models and perform stochastic simulations. The empirical distribution can be easily modified, which improves the accuracy of estimates.	When different variables affect future results, the effectiveness of the method decreases. The problem of forming an effective sample. Based on the assumption that past trends are a correct approximation of future market performance dynamics. Requires significant amounts of empirical data. Very sensitive to the choice of empirical sample length. Demonstrates an "echo effect." Significant decrease in accuracy of estimates at high confidence levels.
Suitability for asymmetrical distributions; excellent applicability for portfolios containing nonlinear instruments; simplicity and clarity of calculations; absence of model risk; consideration of the entire set of risks that caused changes in the price of assets for the analyzed period.	It is possible to err on the assumption that the past can be an error in the future if the depth of the calculation period is insufficient; there is no difference between the impact on the result of old and recent observations; a large number of calculations for large portfolios.

Source: designed by the authors

Thus, the simulation method of risk assessment is considered to be the most correct from the theoretic point of view, that is why it is not limited by a few variants of explanatory variables and, compared to the probabilistic-statistical methods, estimates the expected cost of E (NVP) in a more detailed manner. Through the use of simulation methods, it is relatively easy to read each type of correlation of explanatory variables as well as inter-hour correlations. However, in practice, selecting inherent distributions of explanatory variables and establishing distributions correlations between variables with uncertainty is a very difficult task. That is why one should mention that effective practical application of the Monte Carlo method in risk assessment of investment projects is complicated by the reasons for the determination of probability distribution of variables and correlation of distributions resulting from dependence between different factors.

Totality and inclusiveness are the features of modern economic risk. Therefore, economic risk is one of the fundamental definitions of modern economic theory and investment analysis. In practice, it is important to quantify the risks of investment projects, which determines the absolute or relative size of financial losses that threaten a potential investor in case of risk events. At the same time, the quantitative assessment of risk is objective, since it is based on a certain statistical basis.

In the scientific literature, the probability and statistics methods (probabilistic risk analysis, *PRA*) ground on the expanded assessment of critical flows of money, which is conducted with the use of sensibility analysis. These methods balance the main disadvantage of sensibility analysis – its deterministic nature (Tranfield et. al., 2003) note that the statistical and probabilistic method of risk assessment is based on the analysis of fluctuations of the

estimated indicator for a certain period. Income, gross profit, net present value or net cash flow are used as such estimates in investment analysis. The application of the statistic-probabilistic method can be done in two directions: taking into account probabilistic estimates; without taking into account probabilistic estimates. The probability and statistics methods of risks assessment consider the use of positive random value as the criteria of such characteristics (the amount of damage) as the mathematical expectation; dispersion; the average deviation; the coefficient of variation (the standard relative deviation, which is defined as the average quadratic deviation, divided into the mathematical expectation, i. e. the standard deviation, expressed in fractions of the mathematical expectation); a linear combination of the mathematical expectation, and the average quadratic deviation; the mathematical expectation of the loss function, etc.

In the probabilistic-statistical methods, net flows of money are determined by the probabilistic method, i.e. one conducts several possible variants, and assigns a certain probability of occurrence, which makes it possible to carry out a risk assessment using statistical indicators of dispersion. Thus, these methods are based on probability and static assessment of risk, as well as determination of risk as a possible deviation from the expected value, in this case – from the result of the implementation of an investment project in the economic space, which is assessed with the use using various methods of efficiency assessment of investment projects. The risk of the investment project can be determined by estimating the dispersion of possible results around this central value, which in the risk concept is presented by the expected value (Asmussen and Glynn, 2007).

Regarding the economic tasks, methods of the probability theory are drawn to the determination of the values of the probability of occurrence of events and to selecting from possible events the most desirable scenario, based on the highest value of mathematical expectation, equal to the absolute value of evaluation of this event multiplied by the probability of its occurrence. The degree of risk is measured by two indicators: the average expected value and the fluctuation of the possible result. Random value dispersion and standard deviation, which are indicators of dispersion of a random variable around an average value, are most often used as indicators of risk associated with a certain investment project. The greater is the dispersion values, the higher are the risks (Inselbag and Kaufold, 1997). As a risk indicator within the limits of the probability and statistics methods, one also uses the variability coefficient, which is a relative indicator, allowing comparing the risks of several investment projects (Lefley, 1996). Thus, the conduction of probability and statistics risk assessment of an investment project should be based on relevant conceptual aspects (Fig. 6).

Under the probability and statistical assessment of risks of investment projects, regarding the country's infrastructure development and adherence to the proper level of economic security, one should use the method of net present value. Herewith, the *NPV* calculations are treated as random variables, for which a certain probability of their occurrence can be set. Based on this, the expected net present value *E(NPV)* is calculated, which is the absolute decisive criterion for this investment project. If the value of *E(NPV)* is greater or equal to zero, then the project is effective. The scale of risk associated with this project is determined by the value of standard deviation *σ(NPV)* and the shift coefficient *C(NPV)* calculated on its basis – the lower is the value, the lower are the risks (Morrow et. al., 2007).

The relative decisive criterion, based on the presented statistical values, is based on maximizing the *E(NPV)* value and minimizing the standard deviation. However, investment projects with a high expected value are also characterized by high values of dispersion indicators, which leads to the fact that an additional indicator is required for an unambiguous evaluation, which will make it possible to determine the risk that falls on the unit of expected value. This function is performed by the shift factor. Among the considered variants the best is the project, characterized by the lowest coefficient *C(NPV)*.

To estimate the expected value and risk of investment projects on the development of the country's infrastructure, it is necessary to establish the distribution of probabilities for explanatory variables determining the value of net

cash flows. For each explanatory variable, it is necessary to set the distribution of the probability of forming their size at a certain expected level. Sometimes in practice, due to lack of relevant data on the probability distribution, a certain simplification is used, which mainly leads to the definition of several probability states for each explanatory variable adopted, as well as to the definition of probability of its obtaining. As or the example, it can be represented by the *NPV* calculations for three different scenarios – optimistic, pessimistic, and the most real (average), the probability of occurrence of which can be determined, for example, as 0.7 – for the most real and 0.35 – for the optimistic and pessimistic. Nevertheless, the application of the restraint for the three main scenarios (optimistic, real, and pessimistic) is weighted by serious disadvantages (Ruback, 2002). One considers only a few specific variants of the project and assumes that undefined variables are correlated (all variables have simultaneously better or worse values).

The application of the probability and statistics methods is due to the interdependence between subsequent net flows of money. If the flows of money that will take place in the following years are independent (i.e. *NCF*, received in year *t* does not affect the value of the net flow of money in the following year (*t+1*)), then the risks of the investment project are represented by the dispersion of random value and standard deviation. If vice versa, the net flows of money in year *t* depend on the flows of money in the previous period (*t-1*), then one conducts the calculation of the co-variation of net flows of money.

In the probabilistic sense, dispersion risk assessment resides in the assessment of several possible levels of flows of money for each period, as well as the determination of the probability of their manifestation in order to establish the expected balance of these flows (*NCF*). Assuming that flows of money of a given investment project are independent, then the product of their manifestation probability determines the probability of manifestation of a certain balance of these flows – net flows of money.

The combination of possible flows of money forms the following scenarios, for which the *NVP* indicators are calculated. Based on this, it is possible to determine the expected net present value, dispersions of random variables, standard deviations, and the variability coefficient (Maritan 2001). Thus, we offer the following procedure for calculation of the expected value *NVP* of the investment project in the national economic space (Table 2).
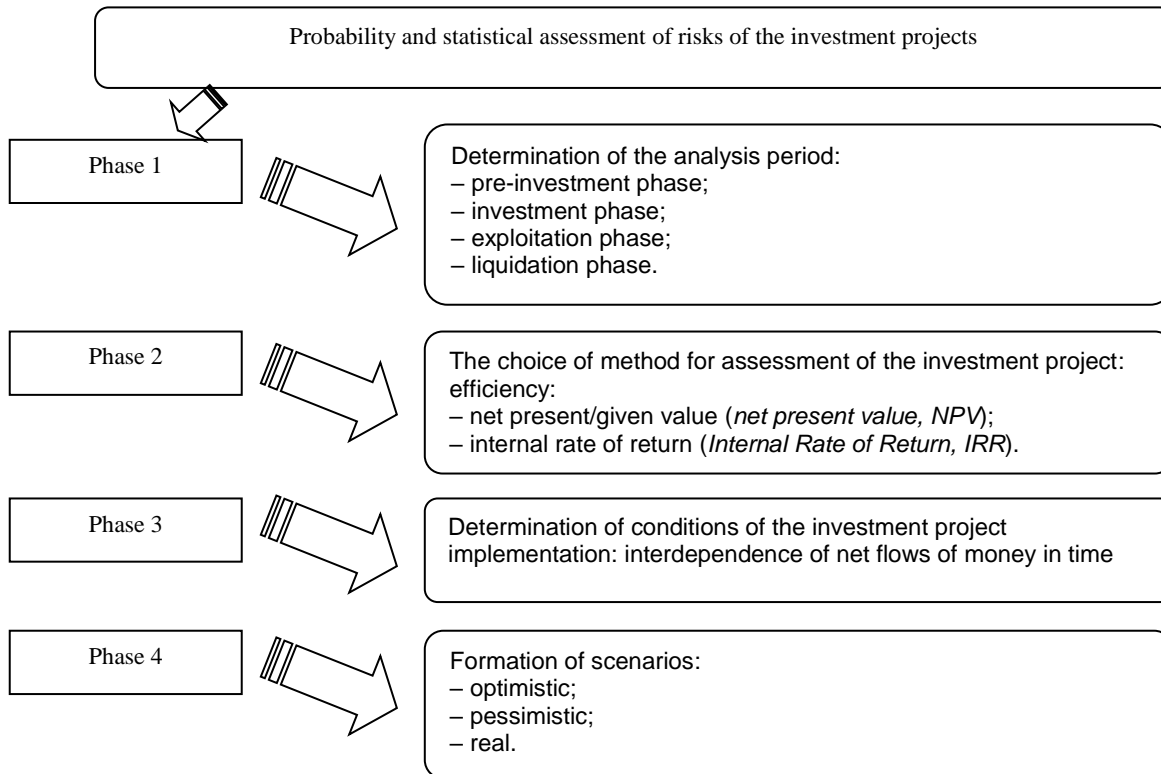
Figure 6. Conceptual principles of probability and statistical assessment of risks of the investment projects, regarding the country's infrastructure development at the given interval of economic security
Source: designed by the authors

When determining the semi-dispersion risk, one should calculate the semi-dispersion of the net present value, semi-deviation, and the coefficient of semi- variability. A standard semi-deviation is an absolute risk measure, which can be used as a criterion in the absolute assessment. As a relative assessment criterion, it can be used when comparable projects have a similar level of expected values. Otherwise, the coefficient of semi-variability can be used as the relative risk measure. Semi-dispersion and standard deviation, as in the case with disperse risk, should be calculated based on less aggregate raw data, which is less pragmatic (Belli, 2001).

Table 2. The procedure of calculation of the expected value *NVP* of the investment projects within the national economic space and coordinates of economic security

№	Indicator	Calculation formula	Commenting
1	Net present value E(NPV)	$$E(NPV) = \sum_{i=1}^{n} p_i \times NPV_i$$	$E(NPV)$ – expected value, NPV, p_i – probability of occurrence of the i-scenario, NPV_i – cost of the i-scenario.
2	Dispersion	$$V(NPV) = \sum_{i=1}^{n} p_i \times \left[NPV_i - E(NPV) \right]^2$$	$V(NPV)$ – dispersion of NPV, $E(NPV)$ – expected value of NPV, p_i – probability of occurrence of the i-scenario, NPV_i – the NPV cost of the i-scenario.
3	The standard deviation of dispersion	$$\sigma NPV = \sqrt{V(NPV)}$$	σNPV – standard deviation of net present value, $V(NPV)$ –dispersion of the NPV.
4	Variability coefficient of net present value C(NPV)	$$C(NPV) = \frac{\sigma NPV}{E(NPV)}$$	$C(NPV)$ – variability coefficient, σNPV – standard deviation of net present value, $E(NPV)$ – expected value NPV.
5	Semi-dispersion of net present value	$$V(NPV)sem = \sum_{i=1}^{n} p_i \times h_i^2$$	$V(NPV)sem$ – semi-dispersion of NPV, p_i – – probability of occurrence of the i-scenario, h_i – factor, depending on the deviation ratio
6		$$h_i = \begin{cases} 0 \leftrightarrow NPV_i \\ NPV_i - E(NPV) \leftrightarrow NPV_i \prec E(NPV) \end{cases}$$	
7	Semi-deviation of standard NPV value	$$\sigma(NPV)sem = \sqrt{V(NPV)sem}$$	$\sigma(NPV)sem$ – standard semi-deviation of net present value, $V(NPV)sem$ – semi-dispersion of NPV.
8	Semi-variability coefficient	$$C(NPV)sem = \frac{\sigma(NPV)sem}{E(NPV)sem}$$	$C(NPV)sem$ – semi-variability coefficient, $\sigma(NPV)sem$ – standard semi-deviation of net present value, $E(NPV)sem$ – expected semi-value of NPV.

The dispersion risk is calculated in practice during investment decision making. This results from the fact that the distribution of the probability of positive and negative deviations is mainly symmetrical. That is why the semi-dispersion may be equal to half of the dispersion, and, therefore, the application of these two methods may produce similar results. If the distribution is not symmetrical, then the value of semi-dispersion is less from the one of dispersion. At the same time, with the growth of this difference, the risk perceived in the negative vision decreases. In our opinion, the average quadratic deviation (standard deviation), the average absolute deviation, dispersion, and semi-dispersion are the common absolute indicators of assessing the risk level of real investment. These indicators ground on the deviations of individual values of a random average from an average measure. The application of indicators of the average quadratic deviation, dispersion, and semi-dispersion makes it possible to quantify the risk of several projects or several variants of one project. At the same time, a project with the minimum value of these indicators will be characterized by the lowest risk as it is for such a project that the scattering of random value around its average value will be the lowest (Francis & Ibbotson, 2002).

Dispersion and semi-dispersion are the main probability and statistics methods of risk assessment. They are applied when the financial flows of the following years are independent. If the flows of money (NCF_t) in year t

are dependent on the financial flow for the previous period (*t-1*), then to assess risk, one uses the covariance method. This method is associated with conditional probabilities of net flows of money. To put in in other words, if in year *t=1* there are *i*-net cash flows (*NCF$_{1i}$*), and the indicators of probability *p$_{1i}$*, corresponding to them, then in year *t=2* there are *j*-net flows of money (*NCF$_{2j}$*) and indicators of probability *p$_{2j}$*, corresponding to them. At the same time, this probability is of conditional nature and determined based on the criterion:

$$p_{2j}(\frac{NCF_{2j}}{NCF_{1i}}) = \frac{p(NCF_{1i} \wedge NCF_{2j}}{p_{1i}(NCF_{1i})}$$

(1)

where: $p_{2j}(\frac{NCF_{2j}}{NCF_{1i}})$ – probability of the net flows of money *NCF$_{2j}$* under the condition of the previous appearance of net flows of money, *NCF$_{1i}$*, *p$_{2j}$*;

$p(NCF_{1i} \wedge NCF_{2j}$ – probability of receiving the net flows of money *NCF$_{1i}$*, in the year *t=1* and *NCF$_{2j}$* the year *t=2,* or through their simultaneous manifestation.

Upon rearrangement, we get the example of the determination of occurrence probability in the year *t=1* and the year *t=2* for the net flows of money of *NCF$_{1i}$* and *NCF$_{2j}$*:

$$p(NCF_{1i} \wedge NCF_{2j} = p_{1i}(NCF_{1i}) \times p_{2j}(\frac{NCF_{2j}}{NCF_{1i}})$$

(2)

After determination of conditional probabilities for the given net flows of money, through the use of examples with independent *NCF* flows, the authors calculate the *NPV* values for all possible combinations of the *NCF* flows, and after that – statistical risk measures: expected net present value, standard deviation, and variability coefficient. The co-variance, which determines the dependence between the following net flows of money, can be calculated based on the following example:

$$\text{cov}(NCF_1, NCF_2) = \sum_{i=1}^{n} p_i \times ((NCF_{1i} - E(NPV_1) \times (NCF_{2i} - E(NPV_2))$$

(3)

where: $\text{cov}(NCF_1, NCF_2)$ – covariance between net flows of money during the first and second year for the given investment project.

Covariance is a category, characterizing common changes for two random variables, in particular, if it: equal to zero (*cov=0*), then net flows of money are regarded as independent; greater than zero (*cov>0*), then the *NCF* flowsє are positively interdependent; less than zero (*cov<0*), then net flows of money are negatively interdependent. The use of the variation coefficient makes it is possible to compare oscillation of characteristics, expressed in different metric units. The variation coefficient can range from *0* to *1*. The greater is the variation coefficient, the greater is the fluctuation. The greater is the fluctuation, the higher is the risk (Gollier 2010). When choosing the best solution, it makes sense to use the rule of the optimal result variation, the key idea of which resides in the fact that from all possible solutions, one should choose the one, under which the probability of victory and loss for the same risk investment has a small gap, i.e. the smallest value of the average- quadratic deviation and variation.

5. Discussion

Thus, the main advantage of the probability and statistics methods is that risk measurement is carried out with the use of objective measures – standard deviation and coefficient of variability. At the same time, these methods are characterized by certain disadvantages, in particular, the need for a significant number of assumptions as well as the complexity of the probability assessment of both net flows of money and particular scenarios. When using the offered approach for consideration of a risk factor during the assessment of efficiency and expediency of investment projects implementation, regarding the development of the country's infrastructure and advancement of the economic security level, an investor can make a reasonable choice of the best of them. This will improve the degree of justification of the investment decision making, reduce the probability of deterioration of the potential investor's financial state, and improve the correlation between the level of risk and expected return on implementation of investment projects, connected to the infrastructure development within the national economic space.

Thus, to activate the attraction of investments in the country's national economy, it makes sense to use efficient instruments of investment provision and consideration of the economic security components. Among modern instruments (stimuli) of investment provision of the national infrastructure development are the system of economic development monitoring, an effective credit policy, constructive interaction of local authorities with investors, government orders for products and services, advancement of the level of tax culture of the entities involved in investment activity, the mechanism of effective protection of the banking establishment rights under the long-term investment lending, etc.

The future research in this area can be formed in the expansion of the concept of investment provision of the national infrastructure development, the formation of the national investment policy considering the development of general infrastructure via the attraction and use of investments (including), based on strengthening the level of economic security. In order to achieve a high level of development of the general infrastructure of the country, a conceptual approach to the formation of the investment support of the infrastructure development can also be formed, which provides for conducting research in accordance with the logically related hypotheses regarding the interdependence of socio-economic situation in the country, development of its infrastructure, investment policy and economic security. To achieve a high level of development of common infrastructure of the country, one can also observe the formation of the conceptual approach to the formation of investment provision of the infrastructure development, including the implementation of research according to the given logically-related hypotheses, concerning the interdependence of socio-economic state in the country, development of its infrastructure, investment policy, and economic security. Such a conceptual approach to building the investment provision for infrastructure development can become the basis for scientific research, upon the results of which, one will substantiate the constructive toolkit for the development of investment provision of infrastructure development with consideration of the requirements of modern times.

Conclusions

Based on the results of the held research, the authors determined that the assessment of risks of the investment projects for the development of the country's infrastructure and provision of a high level of economic security can be carried out through the use of formatted economic and mathematical methods and models. Nonetheless, the article reveals that the most appropriate tool for it is the use of the Monte Carlo simulation analysis method, considering random variables, absence of knowledge or a mistake of the investors. In view of this, in their research, the authors formed the procedure of the Monte Carlo method use for assessment of the risks of an investment project, regarding the country's infrastructure development, covering five stages (formation of a

financial model of an investment project, the establishment of a hypothetical probability distribution, simulation of the first experiment, conduction of a range of simulation experiments, determination and assessment of the empirical distribution of the value of the explanatory variable).

To use the method of probability and statistical assessment of risks of the investment projects for the development of the country's infrastructure, the authors offered to apply the method of net present value. Herewith, the *NVP* calculations are interpreted as random variables, for which it is possible to set a certain probability of their occurrence. Based on the determined advantages of the selected methods, the authors formed the procedure for calculation of the expected *NVP* value of the investment project, involving the calculation of such indicators as the net present value *E(NPV)*, dispersion, standard deviation of dispersion, change coefficient of the net present value *C(NPV)*, semi-dispersion of the net present value, semi-deviation of standard value of *NPV*, and coefficient of semi-variability. On the other hand, relevant assessment of the investment projects' risks for the development of the country's infrastructure is impossible without assessment of their efficiency, which is very often carried out through the use of the method of sensibility analysis of efficiency indicators. This method is one of the best known, easy to use, and makes it possible to determine those parameters, which are considered to be the riskiest ones for a given investment project. The sensibility analysis method also provides an opportunity to trace the influence of a specific parameter on the result, which can be both an indicator of the project efficiency in general (*NPV*, *IRR*, *PI*, payback period), and an annual indicator of the project's activity.

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Lidiia KARPENKO, Doctor in Economics, Professor, Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine
ORCID ID: orcid.org/0000-0002-2888-2477

Mykola IZHA, Doctor of Political Sciences, Professor, Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine
ORCID ID: orcid.org/0000-0001-7221-4794

Iryna CHUNYTSKA, Doctor in Economics, Assistant Professor, University of the State Fiscal Service of Ukraine, Irpin
ORCID ID: orcid.org/0000-0002-9718-1332

Andrii MAIEV, PhD in Public Administration, Associate Professor, Odessa Regional Institute for Public Administration of the National Academy for Public Administration under the President of Ukraine
ORCID ID: orcid.org/0000-0001-9333-2933

Kateryna HUNKO, PhD Student, University of the State Fiscal Service of Ukraine, Irpin
ORCID ID: orcid.org/0000-0002-1717-5937

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AREAS OF SMALL BUSINESS DEVELOPMENT IN UKRAINE IN THE CONDITIONS OF EUROPEAN INTEGRATION

Kazimierz Pajak [1], Viacheslav Volik [2]*, Iryna Slovska [3], Yuliia Lushchyk [4], Hanna Tsyhanok [5]

[1]Institute for International Cooperation Development, 24-26/1 Kazimierza Wielkiego Street, Poznan, 61-863, Poland
[2]Mariupol State University, 129a, Budivelnykiv Ave., Mariupol, 87500, Ukraine
[3] National University of Water and Environmental Engineering, 11, Soborna str., Rivne, 33028, Ukraine
[4,5] Sumy National Agrarian University, Gerasima Kondratyev str., 160, Sumy, 40000, Ukraine

E-mail: [2] volik_v@ukr.net (Corresponding author)*

Abstract. The relevance of the subject of this study is due to the situation and negative trends in Ukrainian small business, the importance and number of this type of business entities, and institutional constraints on business activities, which requires increasing its effectiveness and efficiency through sustainable development. The purpose of the paper is to develop theoretical-methodological foundations, scientific-methodical and practical recommendations for the development of small business in Ukraine. To obtain specific scientific results both general scientific and specific methods of study were used: a complex of economic-statistical and economic-mathematical methods of analysis and modeling. The state and tendencies of development of national small business were analyzed. Based on the obtained results the comparative analysis of specifics of small business in Ukraine was carried out. The strategic priorities of small business development of Ukraine were substantiated, which observance will promote growth of national economy and will allow to clearly identify necessary areas of support for small business entities in the course of development and implementation of programs of development of small business at various levels of management. The basis for the development of national and regional strategies for small business development should be not only regulatory and legal support, but also previous positive experience, in particular, on the implementation of strategic projects for small business development in leading European countries, regions and separate cities. The fact that in Ukraine small business is not yet given due attention, there is no clear concept and in fact the declared strategy of its development is not implemented, proves the need to develop small business and reflect this in the development of a strategy.

Keywords: small business; strategy; institutional constraints; development

1. Introduction

The experience of many countries around the world shows that small business should be seen as a driver of economic growth (Vial & Hanoteau (2015); Vigliarolo (2020)). Effective development of small business creates the preconditions for solving the problem of employment and ensuring the welfare of the population. However, the activities and development of small business are more vulnerable to the impact of unpredictable market threats than those of large and medium-sized business entities.

All this, as well as the most significant (over 99 % in Ukraine as of 2019) share of small entrepreneurs in the structure of economic entities of the national economy determine the relevance of development of methodological foundations and scientifically sound tools for effective implementation of small business development programs at all levels of management, taking into account the country, regional or sectoral variability of market conditions for doing business.

In 2019, in Ukraine there were over 1.8 million small business entities (of which almost 19 % were legal entities), which generated 16 % of GDP. 49 % of all jobs in the country were created by small business entities. However, over the past ten years, employment in small business has decreased by almost 16 %, which was also caused by the lack of a balanced scientifically sound strategy for small business development and real practical measures for this development.

The above negative trends and the orientation of Ukrainian small business products mainly to the domestic market, despite the new opportunities and challenges related with globalization 4.0, accelerated development and use in business of information and computer technologies, artificial intelligence, etc., require development of not only new conceptual approaches in the theory of entrepreneurship but also practical recommendations, the implementation of which will improve the management of the potential of small business in Ukraine, will promote the intensification of innovative activities of small entrepreneurs in the process of building the national economy.

The urgency of the development of small business in Ukraine is evidenced not only by the need to increase the level of GDP generated by national small business entities, but also the low position of Ukraine in international rankings: 81st position of 137 in the global competitiveness ranking; last position in Europe and 135th position of 162 in the economic freedom ranking; 43rd position of 190 in the tax burden ranking; 126th position of 180 in the corruption perception ranking; 45th position of 203 in the globalization ranking; 47th position of 129 in the global innovation ranking; and 64th position of 190 in the doing business ranking. The improvement of these ranking positions, as well as the reduction of the unemployment rate in Ukraine, which in 2019 amounted to 8.6 % and in the second quarter of 2020 reached 9.6 %, may, in particular, contribute to the progressive development and effective activities of small business entities, which are difficult to count on in the absence and/or low efficiency of implementation of the state, regional and non-state programs and measures for small businessmen.

2. Literature review

Scientific thought distinguishes between two main models of entrepreneurship: classical and innovative. The classical model is focused on the most efficient use of all types of resources of a business entity. The model involves the assessment of available resources, the study of opportunities to achieve the goal, the practical implementation of opportunities, which can provide the maximum economic effect from the use of resources (Galvão et. al (2020)).

The innovative model is focused on the active use of the latest management, technical, technological and socio-economic solutions and provides for (Senapati & Ojha (2019)): goal setting, study of the state of the environment and the search for additional opportunities, comparative assessment of available resources and identified opportunities, search for external resource sources, analysis of the competitive environment, implementation of tasks in accordance with an alternative option, which is followed by the largest positive economic effect.

Ahsan (2020) giving a comparative description of classical and innovative models of entrepreneurship, as the main criteria for comparison uses the following: the purpose of business activity, means to achieve the goal, variability of actions, attitude to risk, response to changes in the economic environment, incentive system.

Based on IDEF0 methodology, Kimmitt & Munoz (2017) developed a functional model of business activation, which illustrates the structure of business processes, their relationships, provides for an assessment of the optimal organization of interaction between different business processes and within each of them. The suggested model takes into account the influence of external factors, coordinated interaction of public authorities, support and promotion of business in the context of the function of motivation.

In the light of dynamic changes in the environment, current challenges and recent trends in the national economy development, it is considered objectively necessary to digitize the latter, to develop digital infrastructure, stimulate the domestic market of production, use and consumption of digital technologies (Karlan & Valdivia (2011)).

Digitalization as an effective mechanism of economic growth will allow to implement the accelerated scenario of digital development of society while removing existing barriers, motivating business, implementing state projects of digital transformations, creating and developing digital infrastructure, developing digital entrepreneurship and extending digital competencies (Yadav & Gulati (2019)).

In-depth study of basic models of economic development proves the need to study models of regional development, their typification of evolution and special features (Bhuiyan & Ivlevs (2019)). It should be noted that some scientists understand the models of regional development as "country" models of economic development (Mmereki et. al (2020)).

At present, most scientific works focus on the study of regularities in the process of modeling of the organizational development of economic entities, in particular, the special features of alternative models of organizational development, the possibility of their adaptation to market needs and practical application (Shapiro & Mandelman (2016)). As organizational development is one of the ways to make organizational changes, the author considers it appropriate to consider models of organizational change in more detail.

Highly appreciating the theoretical-methodological and scientific-practical contribution of the above scientists in supporting the development of business (including small business), it should be noted that a number of problematic aspects require further study. Although many scientific works focused on recording and analysis of financial results, tax regulation, the financial mechanism of small business development, etc. constant changes in the strength and sometimes the nature of the influence of various factors on the activities of small business determine the feasibility of further study of these issues. The level of validity of small business development forecasts in different scenarios of the market situation also remains unsatisfactory, insufficient attention is paid to improving the efficiency of small business, ensuring its innovation nature, rapid adaptation to change, minimizing losses from market threats, etc.

3. Research Methodology and Data

Synthesis of the results of fundamental and applied research of scientists on the problem of small business development is the methodological basis of the paper. The main scientific method of study in the paper is a system one, the use of which has led to the study of bottlenecks in the development of national small business. The following general scientific methods of study were used to obtain specific scientific results: dialectical method; hypothetical-deductive method — to build the main working hypotheses of the study; inductive method — to move from the results of a scientific experiment to the development of general procedural guidelines; analytical method — to identify problematic aspects of small business development; a complex of economic-statistical and economic-mathematical methods of analysis and modeling — to identify signs of violations of the process of small business development; methods of analogy — to substantiate the main recommendations for the development of a national program for small business development.

Scientific works of scientists, laws and regulations of the Verkhovna Rada of Ukraine and the Cabinet of Ministers of Ukraine, data of the State Statistics Service of Ukraine, data of financial reports of small business entities, results of own studies of small business development were the information base of the paper.

The following hypotheses were suggested and tested during the study:
1) Reduction to a certain level of the number of current regulatory legal acts governing and regulating the economic activity of small business entities and permitting documents has a positive effect and can be considered as one of the measures for the development of small business;
2) Small business entities such individual entrepreneurs can receive additional synergetic effect as a result of their economic activity, which depends on a combination of three parameters: the number of economic activities, the amount of income and the level of tax burden, which directly affect the results of their economic activities;
3) There is a certain marginal level of profitability, after which it is advisable for small business entities to move a simplified system of taxation. Data on the existence of this level create the preconditions for cost-effective development of a small business entity (SBE).

The purpose of the paper is to develop theoretical-methodological foundations, scientific-methodical and practical recommendations for the development of small business in Ukraine.

4. Results

In most countries, small business is considered as a driving force and a key resource for economic growth, but in Ukraine the problems of small business entities are still not given due attention, as evidenced by the low level of GDP generated by small business (about 16 %) (Government applies prudent food price stabilization policy (2021)).

It should be noted that the share of small and medium-sized enterprises (SMEs) (aggregated statistics for Ukraine provides for the generalization of information on small and medium-sized enterprises) in value added by industries ranges from 45 % to 100 %. As of 2019, the lowest share of SMEs in value added was noted in industry (45 %), and the highest share — in agriculture (97%). In agriculture, a significant share of SMEs is due to the specifics of agricultural holdings, most of which are registered as several limited liability companies). The highest share of SME in value added was also noted in financial and insurance sectors (98 %) and other services (100 %) (Economic stimulus program for overcoming the consequences of the COVID-19 epidemic (2021)).

As of the end of 2019, there were 1,922,978 small enterprises, which corresponds to 99.04 % of all business entities in Ukraine, and specifically 96.93 % were represented by micro-enterprises (Figure 1). However, in 2019, the number of small enterprises decreased by 11.06 % compared to 2010. During the analysis period, the lowest

number of small enterprises was noted in 2012 amounting to 1,578,878 enterprises, which is less than in 2010 by 27 %.
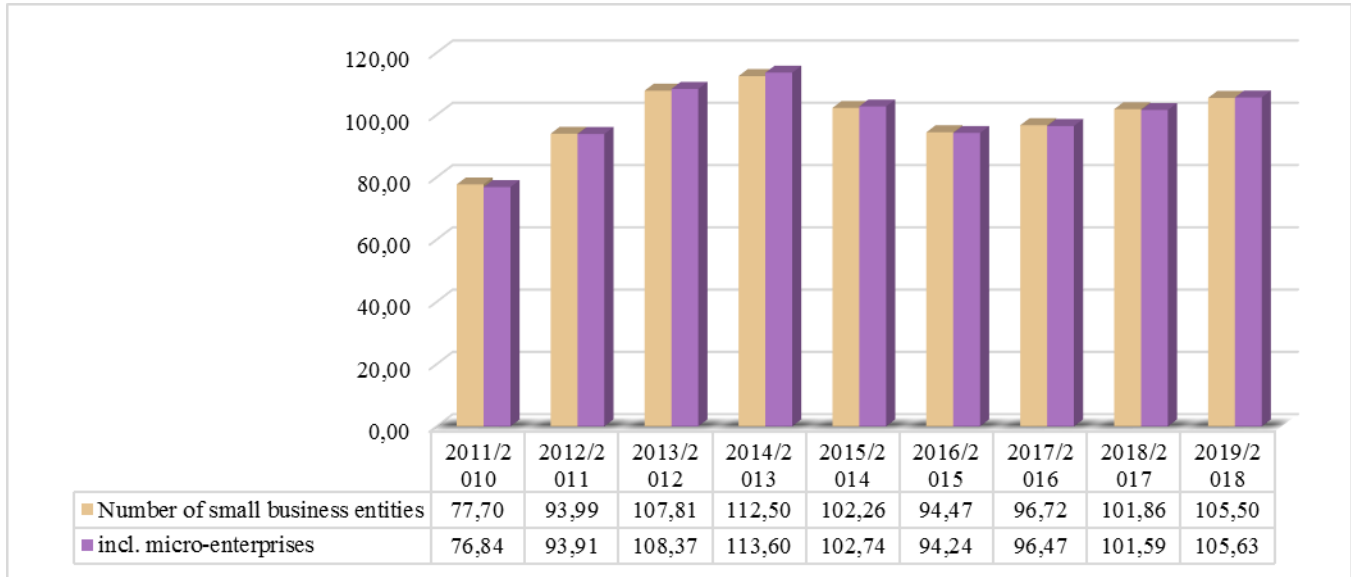

	2011/2010	2012/2011	2013/2012	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2019/2018
Number of small business entities	77,70	93,99	107,81	112,50	102,26	94,47	96,72	101,86	105,50
incl. micro-enterprises	76,84	93,91	108,37	113,60	102,74	94,24	96,47	101,59	105,63

Fig. 1. Relative growth rate of the number of small enterprises, including micro-enterprises in Ukraine during 2010–2019, %
Source: author's calculations based on the data from the official website of the State Statistics Service of Ukraine (2021)

It should be noted that in 2019, 81.16 % of small business entities carried out economic activities without the formation of a legal entity, i.e., chose an individual entrepreneur (FOP) as the organizational and legal form of economic activity (Figure 2).

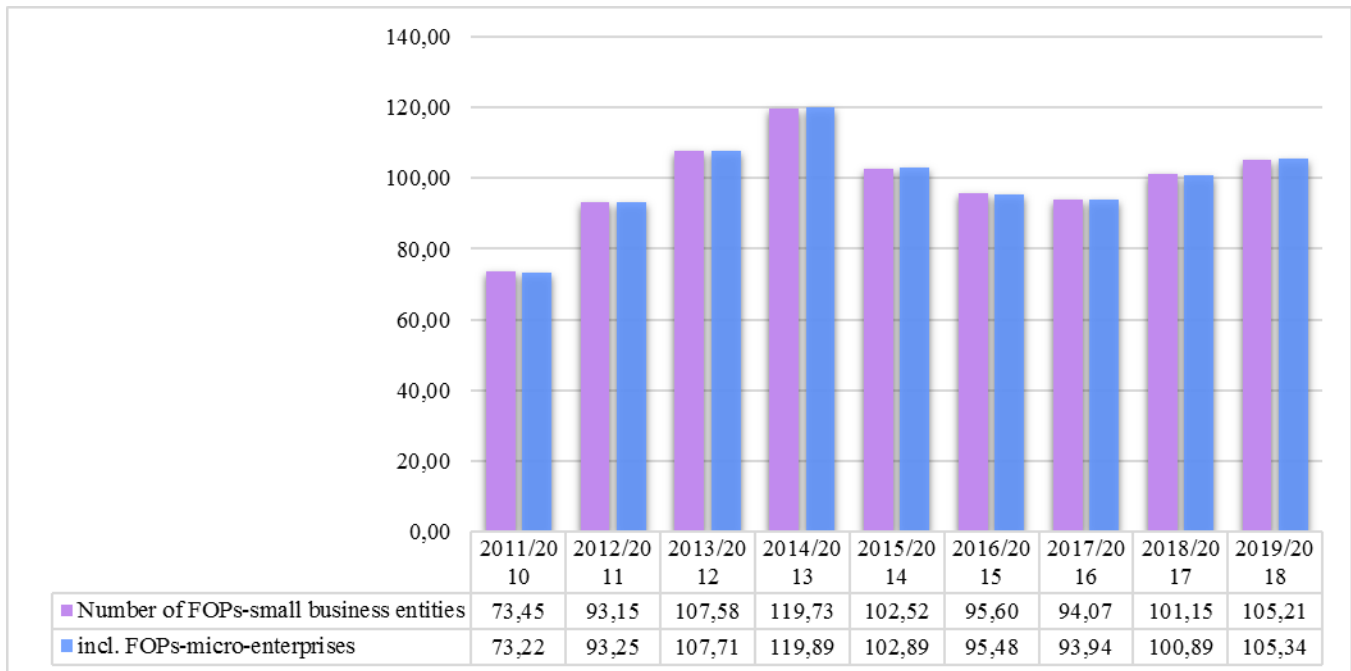|	2011/2010	2012/2011	2013/2012	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2019/2018
Number of FOPs-small business entities	73,45	93,15	107,58	119,73	102,52	95,60	94,07	101,15	105,21
incl. FOPs-micro-enterprises	73,22	93,25	107,71	119,89	102,89	95,48	93,94	100,89	105,34

Fig. 2. Relative growth rate of the number of individual entrepreneurs, small business entities, including micro-enterprises in Ukraine during 2010–2019, %
Source: author's calculations based on the data from the official website of the State Statistics Service of Ukraine (2021)

At the same time, the number of FOPs is similar to the total of SBEs. Their number also decreased by 13.53 % over 10 years. In 2019, the total number of individual entrepreneurs, small business entities, in Ukraine was 1,560,650 persons (this figure corresponds to 80.4 % of all business entities) and specifically 1,550,633 FOPs were represented by micro-enterprises, which corresponds to 99.36 % of all FOPs and 79.86 % of the total number of SBEs. In 2019, the number of individual entrepreneurs engaged in retail and wholesale trade (this type of economic activity is predominant in the structure of FOPs by type of economic activity) was 732,571 persons, which corresponds to 47 % of the total number of FOPs.

However, the volume of products sold by small business entities and individual entrepreneurs in the country in 2019 was insignificant and amounted to UAH 858,337,498.2 thousand, which corresponds to 8.16 % of the total volume of products sold by all business entities in Ukraine. It should be noted that the share of products sold by FOPs and SBEs in the period from 2010 through 2019 fluctuated within 4.8 % (in 2011)–8.16 % (in 2019), demonstrating a growth trend and reaching the maximum value for 10 years in the last reporting period (Figure 3).
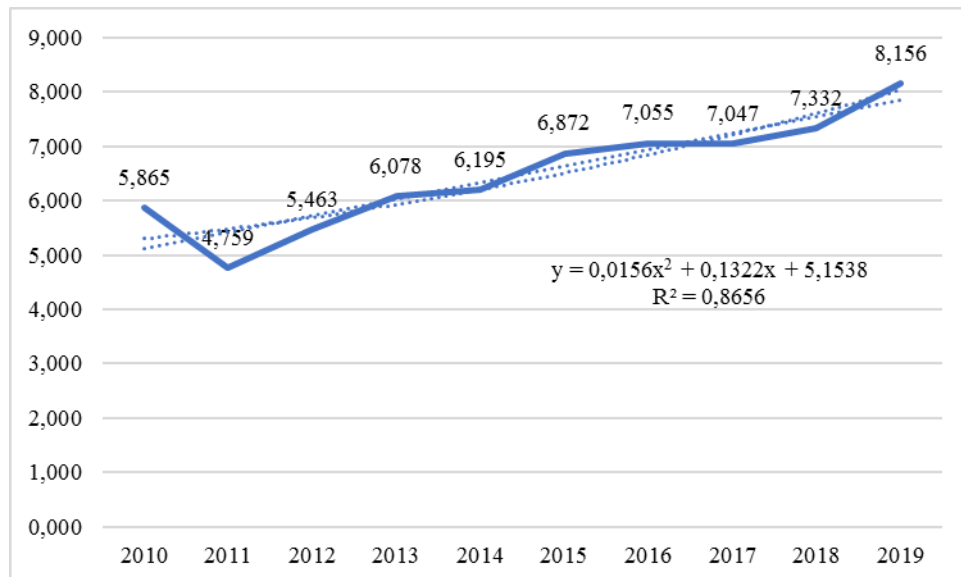

Fig. 3. Share of the volume of products sold by FOPs and SBEs in the volume of products sold by all business entities (%), taking into account the polynomial trend
Source: author's calculations based on the data from the official website of the State Statistics Service of Ukraine (2021)

Individual entrepreneurs provide jobs for more than 2.5 mln ppl per year. As of 2019, the number of people employed by individual entrepreneurs- SBEs corresponded to 2,573,183 persons, including 1,280,252 persons employed by individual entrepreneurs engaged in wholesale and retail trade, which amounted to 49.8 % of all employees employed by individual entrepreneurs-SBEs.

During 2010–2019, the number of SBEs-legal entities (small enterprises and micro-enterprises) remained almost unchanged relative to the baseline indicator of 2010. In 2019, the number of small enterprises decreased by 1.01 %, and micro-enterprises — by 1.04 % compared to the baseline indicator (Figure 4).
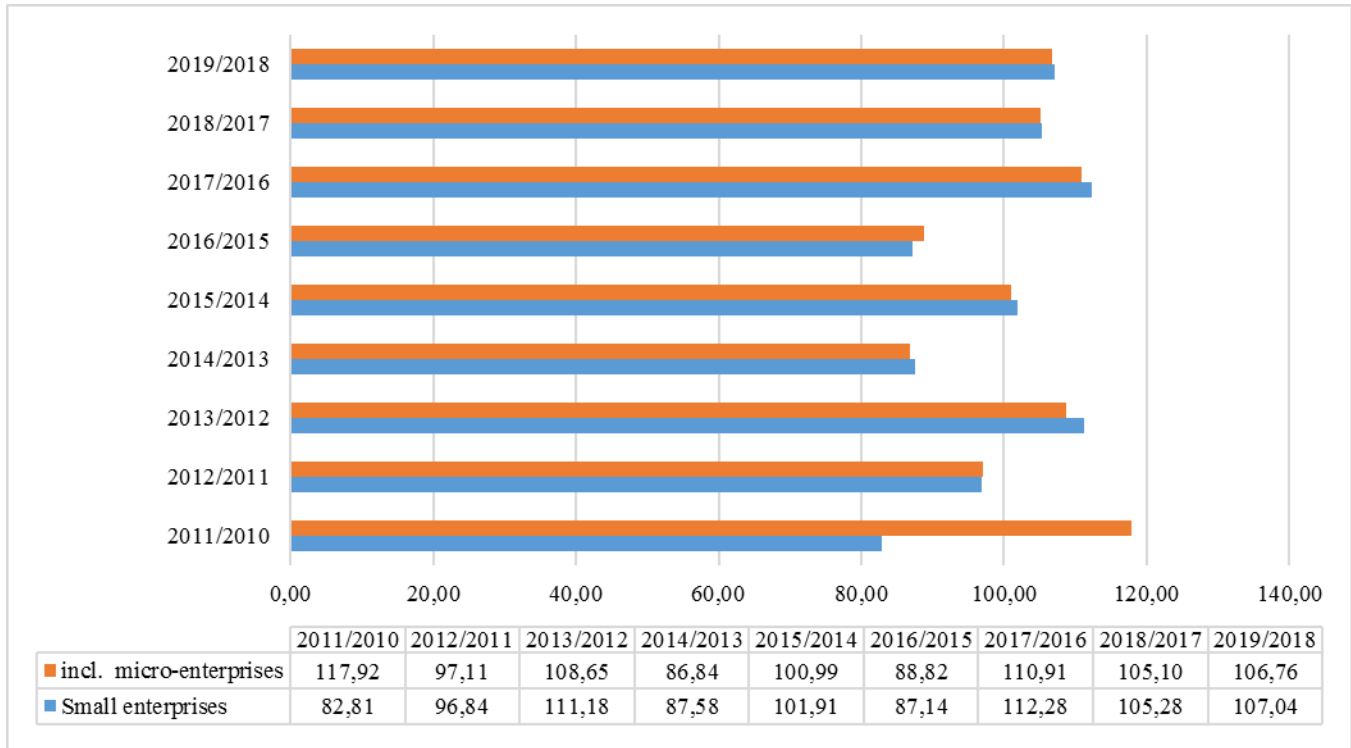
	2011/2010	2012/2011	2013/2012	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2019/2018
incl. micro-enterprises	117,92	97,11	108,65	86,84	100,99	88,82	110,91	105,10	106,76
Small enterprises	82,81	96,84	111,18	87,58	101,91	87,14	112,28	105,28	107,04

Fig. 4. Relative growth rate of the number of small business enterprises-legal entities in Ukraine during 2010–2019, %
Source: author's calculations based on the data from the official website of the State Statistics Service of Ukraine (2021)

At the same time, over the last four years from 2016 through 2019, the number of micro-enterprises-legal entities increased by 65.69 thousand or 26.5 % against the background of a slight increase in their share in the number of small enterprises compared to the same indicator of 2016. It should be noted that in 2019 the share of micro-enterprises in the number of small enterprises (86.5 %) almost reached the maximum figure for the decade, which was noted in 2015. As of 2019, in Ukraine the share of micro-enterprises in the total number of legal entities amounted to 82.34 %, which is 1.5 % higher than in 2016. Accordingly, in 2019, the share of small enterprises in the total number of legal entities was 95.2 %, which is only 0.16 % higher than in 2016. The above data indicate the relative stability of the structure of SBEs-legal entities in Ukraine during 2016–2019 with a slight shift in priorities in favor of micro-enterprises. This trend is explained by the objective advantages of starting and organizing the activities of a micro-enterprise.

The number of employees in small business entities tends to decrease over the last decade (Figure 5). The highest indicator of official employment in small business entities amounting to 4,958.6 thousand persons was recorded in 2010. The lowest employment in small business entities was noted in 2015 and has increased slightly since then. In general, the indicator of 2019 is at the level of 87.1% of the indicator in 2010, which is due not only to the real decline in employment in small business entities, but also the informal employment of part of personnel. In the period from 2010 through 2019, the number of employees in SBEs decreased to 4,958,609 persons. According to World Bank's International Labor Organization, the level of informal employment in Ukraine is between 2 and 4.7 million persons. In fact, this is from 14 to 33% of officially employed.
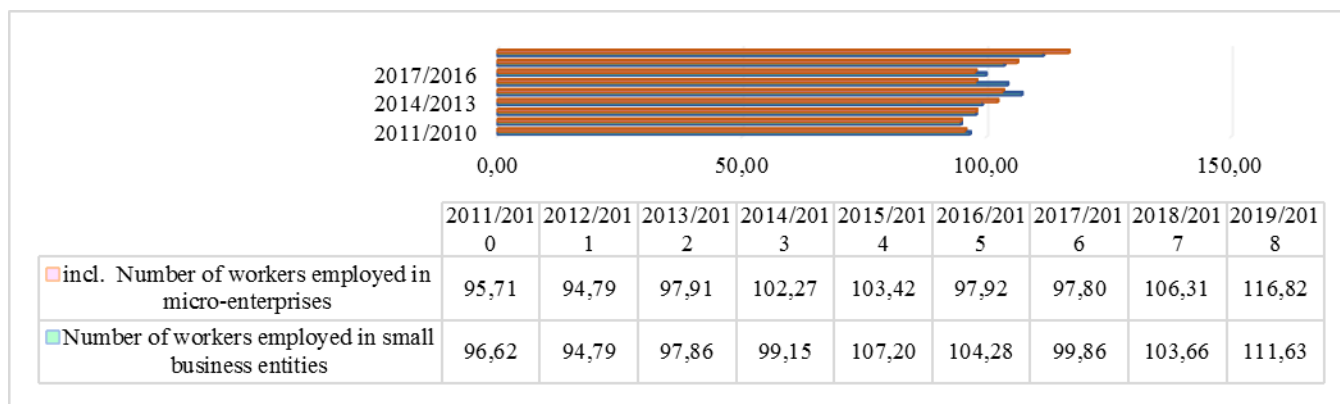
	2011/2010	2012/2011	2013/2012	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2019/2018
incl. Number of workers employed in micro-enterprises	95,71	94,79	97,91	102,27	103,42	97,92	97,80	106,31	116,82
Number of workers employed in small business entities	96,62	94,79	97,86	99,15	107,20	104,28	99,86	103,66	111,63

Fig. 5. Relative growth rate of the number of employees in small enterprises and micro enterprises in Ukraine during 2010–2019, %
Source: author's calculations based on the data from the official website of the State Statistics Service of Ukraine (2021)

In Ukraine, small business entities are an underestimated reserve for employment growth both due to the increase in the number of self-employed persons and due to the jobs they create. It should be noted that the number of hired workers in SBEs over the past 10 years has decreased and in 2019 amounted to 85.6 % of the value of 2010, which corresponds to the value of 2,595,848 persons. The number of employed workers has also decreased over the years of the study. This indicator had the lowest value in 2015. As of the end of 2019, the number of employed workers in micro-enterprises corresponded to 87.4% of the value of 2010.

It should be noted that statistical information on small business entities has not been provided in full on the website of the State Statistics Service of Ukraine since 2018. Most of the data presented relate to small enterprises-legal entities (small enterprises and micro-enterprises), which conditioned the specifics of information provisions, in particular, personnel costs, wages costs and contributions to social activities of Ukrainian small enterprises and micro-enterprises for 2018.

The conducted diagnostics of the state and dynamics of national small business confirmed the presence of negative trends, namely: reduction of the number of small business entities including micro-enterprises during 2010–2019; reduction of the number of individual entrepreneurs-small business entities during 2010–2019; uneven distribution of small business entities by regions as of the end of 2019; distortion of the structure of small business entities by type of economic activity and by volume of products (goods, services) sold by small business entities in favor of certain types of economic activity, including wholesale and retail trade (about 50 %) in 2019; reduction of the number of employed workers in small business entities during 2010–2019; growth of the level of expenses of small business entities in Ukraine during 2010–2019; the presence of 26.7 % of unprofitable small enterprises and 27.9% of micro-enterprises of their total number in 2019; lower than the average level of profitability of operating and all other activities of small enterprises during 2017–2019; unprofitable economic activity of small enterprises during 2010–2017 and micro-enterprises during 2010–2018; almost twice lower growth rates of own capital of small enterprises compared to the growth of own capital of large enterprises in Ukraine in 2019.

Small business plays a key role in the economy of the country, and at the same time suffers the most from the effects of negative factors, in particular, from the crisis caused by the COVID-19 pandemic. As a result of the restrictions established during the quarantine, the following negative effects took place: some sectors have not been able to function properly due to the ban on doing business; traffic restrictions have complicated the logistics of workers; falling incomes of the population. As of May 27, 2020, during the quarantine period the gross value added of SMEs in the hotel and restaurant business and in the field of education and culture decreased by more than 90 %, and in wholesale and retail trade and in the area of provision of professional and administrative

services — by 45 %. Employment by sectors in small and medium-sized enterprises decreased by 4 %–41 % (the largest decrease in employment was in the hotel and restaurant business).

According to the State Fiscal Service, the amount of taxes paid decreased by 40 %–80 % in some sectors. The largest losses by the amount of taxes are noted in wholesale, retail trade and industry, and by the share of uncollected taxes — in education and culture (–77 %) and hotel and restaurant business (–81 %) (Official website of the State Statistics Service of Ukraine (2021)). It should be noted that as a result of the economic downturn worldwide due to coronavirus disease, national small business entities have limited sales opportunities, which negatively affects their economic activities.

5. Discussion

Activation of structural rebuilding of the economy, performance of a number of important functions on diversification and adaptation of production. Traditionally, entrepreneurs set the direction of economic growth. This primarily applies to services provided to the population: personal, trade, tourist, business services: consulting, marketing, engineering, etc (Martínez et. al (2018)). In the above sectors, small business entities fill the niches, which are not coved by large and medium-sized business entities. This is relevant for both foreign and national small business entities.

World experience (Sohns & Diez (2018)) proves the high efficiency of small business, which is achieved through specialization, the ability to produce goods needed by the market, to meet the needs in scarce services, to manufacture custom products. Small business entities are completely independent in carrying out economic activities, have all the capabilities to ensure the management of production, supply, and sales on the basis of simple organizational structures with a minimum number of administrative staff (Halim et. Al (2014)).

However, Ukrainian SBEs are characterized by low efficiency of economic activity, which is confirmed by the results of research. At the same time, they are characterized by the low indicator of labor productivity, which is due to the low level of automation and mechanization of production processes, as well as a small share of SBEs that use the latest technologies; significant energy intensity (exceeding world indicators by 2.5–3 times) and material and material intensity of production in Ukraine (exceeding world indicators by 2–2.5 times).

Small business entities around the world are characterized by mobility, as the lack of significant investment allows them to respond more quickly to changes in market conditions and develop unclaimed segments (Mondal & Jimenez (2015)). This feature is due to the nature of small business entities and low total value of assets at their disposal.

There is ample evidence that small business-dominated communities are socially stable, actively involved in the electoral process, attract more tourists to the region, and support more enterprises (Bögenhold & Klinglmair (2015)). Another positive aspect of small business is the local concentration of funds and, respectively, the growth of local economic indicators. As a result, there is an increase in the well-being of the local population, the number of jobs and tax revenues to the budget.

The above indicates the great political importance of small business. This is relevant for many developed countries, as entrepreneurs as a social group are the basis of the middle class, the most representative in number and one that expresses the political preferences of a large part of the population.

In the context of sustainable socio-economic and political development of society, small business entities are distinguished by the commitment to the principles of democracy, political stability and economic freedom. They are most active when there is a threat to property, as, in contrast to large and medium-sized owners, for small

business entities their property, for the most part, is the main source of livelihood and the most important means of self-expression.

Ukrainian small business entities display high resilience to adaptation to market conditions due to the increased complexity and dynamism of the latter. In countries with developed market economies, SBEs operate mainly in a stable external environment and are less adapted to its changes due to lack of experience of adaptation (Hall et. Al (2019)).

It should be noted that in Ukraine recently there have been positive changes in the area of determining the strategic priorities of national small business, which aims to ensure access to the trajectory of sustainable socio-economic development not only of this stratum of economic entities, but also the economy as a whole. By the Resolution of the Cabinet of Ministers dated May 24, 2017 No. 504-p. there was approved the "Strategy for Small and Medium-sized Enterprise Development in Ukraine until 2020" (On Approval of the Strategy for Small and Medium-sized Enterprise Development in Ukraine until 2020 (2017)), which was developed taking into account the main provisions of the current regulations.

In addition to the above regulatory legal acts, which served as the basis for developing the strategy for small and medium-sized enterprise development in Ukraine, the Law of Ukraine "On Development and State Support of Small and Medium-Sized Enterprises in Ukraine" With amendments (2012)) approved within the framework of the Association Agreement between Ukraine and the European Union is also the legal basis for small business development.

The starting point for the development of the strategy for small business development can be the creation of a project office for the development and implementation of the strategy — the Small Business Development Center, which will: coordinate and support the actions of all institutions engaged in the process of strategic management.

Conclusions

Thus, we can draw a conclusion that small business is not isolated from the general economic system, but is an integral part of it, which is organically introduced into modern economic practice. It is small business that contributes to the formation of the market as a result of the revival of closed and the creation of new industries, the development of tangible and intangible resources, expanding the scope of innovation.

The study of the development of national small business in dynamics over the last 9 years, which is based on official statistical information, proved the presence of negative trends, namely: reduction of the number of small enterprises and micro-enterprises, reduction of the number of individual entrepreneurs-SBEs, distortion of the structure of SBEs by type of economic activity and volume of products sold, reduction of the number of employed and hired workers in SBEs, increase in the share of expenses of SBEs in the total expenses of business entities, total negative balance of the financial result of SBEs, etc.

The studies of small business development based on statistical information, analysis of financial and property condition of SBEs, sample author's studies and observations allowed to define the features of national small business: tendency to intensification of the structural rebuilding of the economy, functions of diversification and adaptation of production; low efficiency of economic activity, which growth can be achieved through specialization; mobility, quick response to changes in the market situation; special attitude to the labor process; ability and willingness to innovate; availability of necessary organizational skills; social orientation.

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Kazimierz PAJAK, Ph.D., Habilitated Doctor in Economics, Professor, Institute for International Cooperation Development, Poland
ORCID ID: orcid.org/0000-0002-4668-0449

Viacheslav VOLIK, Doctor of Law, Professor, Professor of the Law and Public Administration Department, Mariupol State University
ORCID ID: orcid.org/0000-0002-1344-9486

Iryna SLOVSKA, Doctor of Law, Phd, Professor of the Constitutional Law and Branch Disciplines Department, National University of Water and Environmental Engineering
ORCID ID: orcid.org/0000-0001-9587-2300

Yuliia LUSHCHYK, PhD in Educational Sciences, Senior Lecturer of Foreign Languages Department, Sumy National Agrarian University
ORCID ID: orcid.org/0000-0003-4306-1949

Hanna TSYHANOK, PhD in Philological Sciences, Senior Lecture of Foreign Languages Department, Sumy National Agrarian University
ORCID ID: orcid.org/0000-0003-6303-6831

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EFFICIENCY OF USING THE POTENTIAL OF SMALL BUSINESS IN ENSURING SUSTAINABLE ECONOMIC GROWTH

Irina Skuratovych [1]*, Nataliia Lytvyn [2], Iryna Panova [3], Ievgen Ovcharenko [4], Olena Hryhorevska [5]

[1]*Yaroslav Mudryi National law University, Pushkinskaya str., 77, Kharkiv, 61024, Ukraine
[2] State Fiscal Service University of Ukraine, University str., 31, Irpin, Kyiv region, 08201, Ukraine
[3] Kharkiv National University of Internal Affairs, Lev Landau Avenue, 27, Kharkiv, 61000, Ukraine
[4] Volodymyr Dahl East Ukrainian National University, 59-a Tsentralnyi Ave., Sievierodonetsk, 93400, Ukraine
[5] Kyiv National University of Technology and Design, Nemyrovycha-Danchenka Street, 2, Kyiv, 01011, Ukraine

E-mail: [1]* skuratovych@i.ua (Corresponding author)

Abstract. In Ukraine, small business has not yet become the foundation of the national economy and an important factor of socio-economic development. The negative trends in the activities of small business in Ukraine include a decrease in the number of small enterprises, reduction of the number of employees in small enterprises, and worsening of financial results of their activities. The purpose of the paper is to sum up theoretical and methodical foundations and develop scientific and practical recommendations for improving the efficiency of using the potential of small business in ensuring sustainable economic growth. In the process of the study, the following general and special methods were used: dialectical method; method of system analysis; method of graphic analysis; and method of logical generalization of results. Improvement of the organizational and economic relations of small enterprises with large and medium enterprises was determined as one of the directions of increasing the efficiency of small business potential, and the formation of an integration model of business associations as a set of possible forms of interaction of small, medium and large enterprises and areas of integration was suggested. The role of small business in reducing labor emigration as a form of self-employment and employment was studied. Specifics of innovative activity in the small business sector in Ukraine were considered. In order to increase the efficiency of small business potential, the introduction of innovative incubators was suggested. It is advisable to use the practical results of the study for intensification of business activities, for the purpose of increasing the efficiency of using the potential of small business in ensuring sustainable economic growth of the country.

Keywords: sustainable economic development; innovative business; potential; labor migration; efficiency

1. Introduction

In the difficult conditions of building a socially oriented economy of Ukraine, one of the main tasks is the development of small business, the expansion of business initiative of the population of both the country as a whole and its separate regions. In terms of the pace of small business development, Ukraine lags far behind the leading countries of the world that stimulate and support small and medium enterprises, which contributes to their innovative development, improving the quality and competitiveness of products, improving social living standards.

In the structure of the national economic system, small business, compared to medium and large business, can rightly be considered as the most important component that can determine the rate of economic growth, contribute to strengthening the competitive environment and solving social problems. However, the realities of the economy of Ukraine and its regions indicate negative trends in the main characteristics of small business. In its turn, the level of development of small business depends on the formation, implementation and level of use of its potential. In this regard, the issues of scientific substantiation of the directions of increasing the efficiency of using the potential of small business in ensuring sustainable economic growth of the country are actualized.

In modern models of market economies of developed countries, small business is a significant sector, which contribution to production is more than 50 % of GDP, and the number of employees in this sector reaches 50 % – 75 % of total employment (Baker et. al (2021)). Therefore, all economically developed countries support and stimulate the development of small and medium enterprises, which contributes to the growth of their products, improving their quality and competitiveness, intensification of innovation and investment processes in the business sphere.

2. Literature review

The attitude to business activity formed in the country, the business activity itself and the desire of individuals to carry out business activity are the basis for the potential of small enterprises (SEP). The attitude to business reflects the general attitude of the population to businessmen and business activity (Amato et. al (2017)). If in a country there are people who can not only anticipate new business opportunities, but also have the necessary knowledge and experience, this will both significantly affect the level of SEP and contribute to the economic growth of the country as a whole.

The attitude to business in society affects business activity, and vice versa — the image of successful businessmen contributes to a positive attitude of the population to business. The level of business activity, efficiency of use of SEP in the future will be higher when today there will be more people who want to create their own business, carriers of business ideas, innovators capable of producing new products to meet the individual needs of specific consumers (Alsafadi et. al (2020)).

Over a long period of studies, scientists have proven the relationship between economic growth and business potential (Audretsch et. al (2015)). In underdeveloped countries, there are a large number of small firms that provide consumer services in the local market (Summers (2015)). At the same time, employers do not create additional jobs, which encourages the population to start their own business. If a country is characterized by political and economic stability, which contributes to the development of large business, a decrease in the growth rate of small and medium enterprises is observed (Newman et. al (2017)). But after the country reaches a slightly higher level of development, there is an intensification of business activity due to the improvement of the business environment, changes in social values, the drive of the population to making independent decisions and self-realization. Thus, it is the business behavior of the individual who creates a business and manages it is the basis of business potential.

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At the same time, a businessman, acting in real socio-economic conditions, will not be able to fully implement his business ideas without adequate conditions, appropriate legal, economic, infrastructural support. Business environment is a system set of such conditions, which level of favorableness is determined by the influence of a large number of different factors (Audretsch et. al (2015)). The main such factors include political and legal, economic, institutional, scientific and technical, informational, social factors (Henrekson & Sanandaji (2020)).

It should be noted that the potential of small business, as an economic category, can be considered from different points of view while emphasizing the properties, regularities, principles and factors of its formation and use. The main properties and regularities of formation of business potential should include:
- the relationship and balance of the elements of the potential, which must function simultaneously and in aggregate (Canales (2016));
- the alternative elements of the potential, which can to some extent replace each other (Colpan & Jones (2016));
- the dynamics of the potential formation, which makes it impossible to determine it by way of mechanical addition of constituent elements (Staniewski (2016));
- the business potential can be independently transformed with the emergence of new constituent elements;
- flexibility, adaptability and stability of the potential, which will help preserve its integrity in the implementation of external influences (Dana (2017)).

However, paying tribute to the achieved results, we can identify a number of insufficiently addressed issues of formation, use and development of small business potential as a strategic factor of socio-economic changes in economic growth. The scientific and practical relevance of these issues conditioned the selection of the study subject.

3. Research Methodology and Data

The theoretical and methodical basis of the paper are scientific works on the problems of business development, formation and activation of the business potential of small businesses. In the process of the study, the following general and special methods were used: dialectical method — to identify regularities, principles and factors that promote the development of small business potential; system analysis — to provide insight into the components of the potential of small business; graphical analysis — to schematically reflect the generalized theoretical and practical foundations of the study; logical generalization of results — to develop recommendations for improving the efficiency of using the business potential of small businesses in ensuring sustainable economic growth.
The information base of the study consisted of: legislative and normative legal acts of the Verkhovna Rada and the Cabinet of Ministers of Ukraine, normative documents of ministries and government agencies; official data of the State Statistics Service of Ukraine and the Main Department of Statistics; materials published in scientific and periodic publications, on the Internet, as well as data obtained by the author in the process of his own studies.
The purpose of the paper is to generalize theoretical and methodical foundations and develop scientific and practical recommendations for improving the efficiency of using the potential of small business in ensuring sustainable economic growth.

4. Results

Under the influence of globalization, informatization, intellectualization of the entire economic space and its individual areas, the importance of small business is increased and complicated in modern economic systems. Such traditional functions of this sphere of economic activity as mobility of production, development of the competitive environment, formation of a middle class, and creation of additional jobs remain determinant. Along with this, the formation of an open economy, increasing innovation potential, ensuring sustainable economic growth and establishing social stability acquire a primary value.

It should be noted that achievement of a new stage of transformation of small and medium enterprises is an important indicator of the state of development of the business environment in Ukraine. The main indicators of its presence in the structure of the national economy are commensurate with the indicators of developed countries of the world. The share of small and medium enterprises in the tax formation of the state budget revenues is about 50 %, and their share in VAT averages 60 %. This allows to conclude that small and medium enterprises in Ukraine are gradually becoming an important factor in socio-economic development providing the most part of jobs, GDP of the country, and tax revenues to the consolidated budget.

In Ukraine, there were adopted a number of normative and legislative documents regulating the activities, accounting, reporting and taxation of small businesses, including:
1)   Law of Ukraine "On state support of small business". With amendments (2000));
2)   Economic Code of Ukraine. With amendments (2003));
3)   Tax Code of Ukraine. With amendments (2011)).

In the current normative and legislative documents, there are several signs of identification of small businesses for different purposes. Thus, the Law of Ukraine "On state support of small business" With amendments (2000) defines the legal basis for state support of small business. In Art. 1 of this law, a definition of the concept of small business entity is provided, i.e., it is determined, which business entities belong to the category of small business entities, namely: individuals registered in the established order as a business entity; legal entities, business entities of any organizational and legal form and form of ownership, in which the average number of employees for the reporting period (calendar year) does not exceed 50 persons, and the annual gross income does not exceed UAH 70 mln.

According to Art. 63 of the Economic Code of Ukraine. With amendments (2003)), With amendments (2003)). According to this document, a small enterprise is one that has an average number of employees per year of no more than 50 persons, and their annual gross income does not exceed UAH 70 mln.

According to the Tax Code of Ukraine. With amendments (2011)), small enterprises include those, in which the amount of income of each tax reporting period cumulatively from the beginning of the year does not exceed three million hryvnias and accrued wages (income) for each month of the reporting period of employees who are in an employment relationship with the taxpayer, is not less than two minimum wages, the amount of which is established by law, and which meet one of these criteria: created in the order established by law after April 1, 2011; operating, in which during three consecutive previous years (or during all previous periods, if less than three years have passed since their creation), the annual amount of income is declared in the amount not exceeding three million hryvnias, and in which the average number of employees during this period did not exceed 20 persons; which were registered as a single tax payer in the order established by by law in the period before the the Tax Code entered into force, and in which the volume of income from sales of products (goods, works, services) amounted to one million hryvnias and the average number of employees was up to 50 persons in the last calendar year.

For small enterprises of Ukraine, the main economic and legal forms of business organization are private and collective ones. Different legal forms of small enterprises have special mechanisms of operation. Thus, if we consider various aspects of the operation of a private enterprise, limited liability company, and a joint stock company, the differences between them are observed on such grounds as the nature of ownership, management system, internal control functions, the order of profit distribution.

It should be noted that the condition of the commodity market in Ukraine, on which small businesses operates, differ significantly from that of developed countries. If the developed market relations are characterized by the

predominant influence of demand with a rapid response to it, the priority of private property, developed market infrastructure, efficiency and detail of legislation, availability of production factors, information openness, minimal criminalization, Ukrainian small business operates in more complex conditions, which determine its inherent features. The most significant features, which distinguish it from small business in most countries are the following:

- low technical and technological level with significant innovation potential;
- low management level, lack of knowledge, experience and culture of market relations;
- striving for maximum independence when most foreign small businesses operate under conditions of franchise, subcontracting, etc;
- combination of several types of activity within one small enterprise, impossibility in most cases to be guided by one-product model of development;
- lack of self-organization system and insufficient infrastructure to support small business;
- lack of complete and reliable information on the market condition and situation;
- lack of state financial and credit support;
- low level of information, consulting and training services;
- high level of adaptability to the difficult economic situation complicated by management disorganization and the growing criminalization of society;
- distrust of Western partners and so far a negative attitude of the population to businessmen.

Labor migration is one of the most serious state problems in Ukraine, and urgent measures are needed to address it. Lack of clear principles of state migration policy, a narrow range of countries, with which agreements on mutual employment of citizens have been concluded, insufficient level of social protection of workers necessitate the search for new means of combating labor migration.

In Ukraine, the share of GDP generated by small businesses ranges from 7.7 % to 16.6 % (Expenditure on innovation of industrial enterprises by areas of innovation activity (2020)), depending on the study period, the source of information and the accuracy of the calculations. In the EU member states, the average share of GDP generated by small businesses exceeds 50 %, and the average share of the population employed in small business entities (SBEs) reaches 70 % (Table 1).

Table 1. Characteristics of GDP and employment in small business in the world countries

Country	Share of GDP of a country generated by small business entities	Share of the population employed in small business entities
Ukraine	7.7 %–16.6 %	Less than 11 %
Spain	More than 50 %	46 %–73 %
Germany		
France		
Switzerland	51 %	69.1 %
Japan	52 %–55 %	85%
India	-	80 %
China	60 %	75 %
United Kingdom	50 %–53 %	49 %
Singapore	GDP growth at the cost of small business entities at the level of 5 %–6 % per year	-
Canada	43 %	65 %
USA	50 %%–52 %	60 %

Source: systematized by the authors

Small business not only ensures the development of the national economy on an innovative basis, but also helps to reduce social tensions in society by overcoming a number of pressing social problems, including unemployment as a result of increasing the number of new jobs. It is possible to increase the level of employment of population in small business entities under condition of increasing the number of jobs at the cost of newly created small business entities, as well as through increasing the number of employees in existing economic entities.

Studies of the actual needs of employers in employees to fill vacancies and their declared needs according to the reporting of employment centers showed their inconsistency due to failure to provide information on the need in employees to employment services. Small business entities note the low efficiency of recruitment through employment centers, extending the search for staff over time, the lack of highly qualified staff registered in district employment centers. When selecting staff to fill vacancies, small businesses are mainly focused on their own options. Staff search is carried out by means of advertisements on the Internet and in periodicals (specialized newspapers and magazines). The services of recruitment agencies are too expensive for small business entities, so they are not in demand among this type of economic entities.

The problem of legalization of employment of population in Ukraine is extremely urgent at the present stage of development of the domestic economy. As a result of informal employment, the budget loses money in the form of unpaid taxes by both employers and employees, and citizens who agree to informal employment are deprived of social guarantees. Registration of labor relations in the order established by law, the official receipt of wages ensure state protection against illegal dismissal of an employee, safe working conditions, guaranteed right to rest, timely paid legal wages, pension insurance record and the opportunity to have a decent pension support when a worker reaches retirement age.

It should be noted that the most effective ways to promote legalization of employment of population in Ukraine are to optimize the minimum wage, reduce its taxation, increase liability for violations of labor laws, increase funding for active measures to promote employment of population and small business development.

Studies of the policy of employment of population in small business have shown a distortion of the structure of employment towards certain economic activities, in particular the prevalence of employment of population in wholesale and retail trade over employment in other areas of economic activity.
The above proves the need to introduce measures to stimulate small business and employment of population in other areas of economic activity, in particular, in agriculture, forestry and fishery; health care; arts, sports, entertainment and recreation, where the lowest employment rates are observed, 2 %, 1 % and 0.8 %, respectively, in the general structure of employment in small business.

A separate direction of increasing the level of employment of population in small business is the development and implementation of the state program to prevent unemployment, ensuring a downward trend in unemployment at the cost of small business entities through stimulation of the latter, improving the efficiency of regional employment services to find and replace vacancies.

Given the results of scientific studies, it is possible to draw a conclusion on the key role of small business in solving the problem of unemployment and labor migration.

In general, in 2019, in Ukraine there was recorded an increase in migration in the volume of 10,143 of cases. It should be noted that official statistics do not give us a clear idea of the real scale of external labor migration. According to different national and international institutions, the number of migrant workers ranges from 865,000 to 6.5 mln in 2018. In this case, the values of the volume of labor migration beyond the lower limit of the range

were chosen to build the diagram. This rule also applies to the indicators of all institutions involved for comparison without exception (Figure 1).

Fig. 1. Number of labor migrants from Ukraine as of the beginning of 2019 according to estimates of leading national and international institutions, mln ppl.

Source: built by the authors according to Population and migration (2020),   Labor migration from Ukraine is expected to decline in the medium term (2018), How many Ukrainians went abroad and what should the state do about it (2018), International Monetary Fund. European Dept. Ukraine: Request for Stand-By Arrangement and Cancellation of Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Ukraine. Country Report (2019),   United Nations. Department of Economic and Social Affairs. Population Division. Trends in International Migrant Stock (2017), Last year, 10,000 potential illegal migrants were stopped at the border (2020), Site of International Organization for Migration. One in eight Ukrainians ready to accept a job offer that can lead to exploitation: survey on migration and human trafficking in Ukraine, Moldova, Belarus and Georgia (2019)

It should be noted that most institutions are not able to report the exact number of migrant workers from Ukraine. Thus, according to the State Statistics Service, 1.3–2.3 million people work outside Ukraine. This indicator is calculated on the basis of a survey conducted by the State Statistics Service of Ukraine, which covered 20 thousand households. The obtained results were extrapolated to the entire population of Ukraine using the methodology of the International Labor Organization. The figure of 1.3 mln ppl is understated due to the fact that it includes only the contingent of workers who went abroad for a short time and long-term migrants with families in Ukraine.

Migrant workers who left with their families, as well as those who did not have a family in Ukraine at all, are not included in the sample (Population and migration (2020)), according to the National Bank of Ukraine (NBU), it is from 0.865 to 1.384 mln ppl, which is 5 %–8 % of the total labor force calculated according to the number of the working population of Ukraine in 2018 (Labor migration from Ukraine is expected to decline in the medium term (2018)); according to the non-governmental research center for the issues of economic policy — the Center for Economic Strategy (CES), the number of migrant workers from Ukraine in 2018 was about 4 mln ppl, but the number of workers who are simultaneously outside the country is much smaller and ranges from 2.6 to 2.7 mln ppl (How many Ukrainians went abroad and what should the state do about it (2018)); the International Monetary Fund estimates the number of labor migrants from Ukraine at 2–3 mln ppl (International Monetary Fund. European Dept. Ukraine: Request for Stand-By Arrangement and Cancellation of Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Ukraine. Country Report (2019)).

In 2019, the annual volume of external labor migration from Ukraine is 100 thousand people per month, which corresponds to the intensity of the migration flow of 2 people per minute. Since 2010, about 4 million citizens have left Ukraine, which is about 10 % of the population.

In Ukraine, small business entities are an underestimated reserve for employment growth both due to the increase in the number of self-employed persons and due to the jobs they create for employees. As of the beginning of 2019, 99.1 % of all national business entities are represented by SBEs. It should be noted that the number of hired workers in SBEs has decreased over the past 9 years. In 2018, it amounted to 85.8 % of the indicator of 2010, which corresponds to the value of 2,603,135 people. A similar negative trend is observed for workers employed at the cost of SBEs. During 2010–2018, their number decreased by 15.8 % amounting to 4,173,665 people.

Indicators of the number of employed and hired employees in SBEs indirectly reflect the state and trends of small business development in Ukraine. The decrease in employment of population at the cost of SBEs in the period proves the fact of worsening business environment for this group of business entities.

At present, Ukraine is undergoing significant reforms focused on creation of a favorable environment for the operation of SBEs and deregulation of their economic activities, in particular, removing administrative barriers, eliminating unnecessary administrative procedures, bringing regulations in line with the laws of Ukraine and international legal obligations, reforming the permit system, licensing, state supervision and control bodies, maximum simplification of business conditions, compliance with the principle of transparency and consideration of public opinion.

Ensuring the transition of Ukraine to sustainable economic development requires the fulfillment of key conditions, such as: a decent standard of living, education, equality, long and healthy life, favorable economic and environmental conditions. But the realities show that in 2019 in Ukraine the human development index (0.75) was below the average for countries with a high level of human development (0.755) and the average for Europe and Central Asia (0.758) (Human Development Report for 2019 (2020)). As life expectancy depends on confidence in the stability of one's life, which is ensured, in particular, by the availability of a job and the timely payment of wages, in Ukraine, unfortunately, poverty remains one of the main problems of development of the country today.

It should be noted that intensification of the process of creation of new jobs is an important basis for achieving above conditions, which is constantly due to the growth and improvement of production, its structural changes in accordance with market requirements. Without the creation of new jobs, it is impossible to optimize the production employment of able-bodied citizens in society, which is an important factor in improving both production efficiency and living standards. The increase in employment is also reflected in the level of total income of the population, at the expense of which it is possible to meet the needs in payment for medical services, education, purchase of food, recreation, etc.

Thus, given the limited employment opportunities, rising unemployment, small business can significantly alleviate existing social problems. Activization of the use of the potential of small business to create new jobs and absorb surplus labor during cyclical downturns and structural shifts in the economy should be an important precondition for sustainable economic growth.

In terms of the effectiveness of the innovation process, small business entities have a number of advantages over large and medium-sized enterprises, namely: they have a higher level of mobility, respond quickly to changes in market situation due to small volumes of production and sales and, as a result, have lower risks of losses related with the transition to new technologies. The absence of complex management structures increases the efficiency of management of small business entities, which, in turn, contributes to the rapid improvement and

implementation of technologies. Small business shows high resilience in difficult conditions of adaptation to market conditions, which allows it to be a loyal and long-term consumer of advanced technologies.

Creation of business incubators is one of the promising areas of promoting the development of national small business. Business incubators ensure the effective transformation of existing intellectual products in the regions into competitive products and services, stimulate real investment of private capital in innovation, help increase the export potential of national knowledge-intensive high-tech products. As international practice has shown, the most successful models of business incubators are American, European and Asian ones. According to the results of conducted studies (The Global Innovation Index (GII) (2020)), about 30 % of economic entities continue their activities after the first year of operation, and among the clients of business incubators, this figure reaches 80 %, which indicates the feasibility of participating in incubation.

In 2019, Ukraine ranked 47th in the overall ranking of the Global Innovation Index (37.40 points of 100) losing 5 points over the past 7 years. In 2013, Ukraine ranked 42nd in the overall ranking of the Global Innovation Index. As of 2019, Switzerland ranked first, Sweden ranked second, and the USA ranked third. It was calculated according to the methodology of INSEAD international business school based on 82 variables (The Global Innovation Index (GII) (2020)).

It is worth noting that for the last four years there has been a decrease in the share of innovative industrial enterprises in Ukraine. Compared to 2016, their share decreased by 3.1 % (Figure 2).
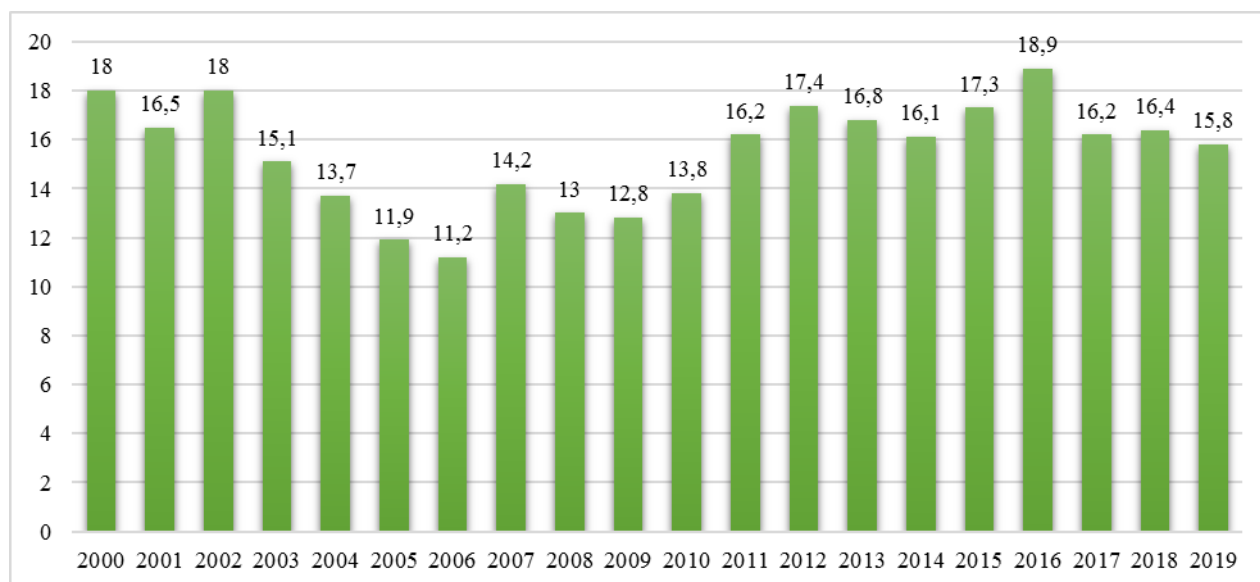

Fig. 2. Share of the number of innovatively active enterprises in the total number of industrial enterprises in the country during 2000–2019, %.
Source: built by the authors according to Expenditures on innovation of industrial enterprises by areas of innovation activity (2020)

Regarding expenditures on innovation, their largest share is accounted for by purchase of machinery, equipment and vehicles: from 54.8 % to 85.3 % during 2000–2019. There is a positive trend of increasing the share of R&D expenditures from 15.1 % in 2000 to 20.5 % in 2019, although in the last year the situation with R&D is not so optimistic. There is a decrease in the share of R&D expenditures by 5.8 % (Figure 3).
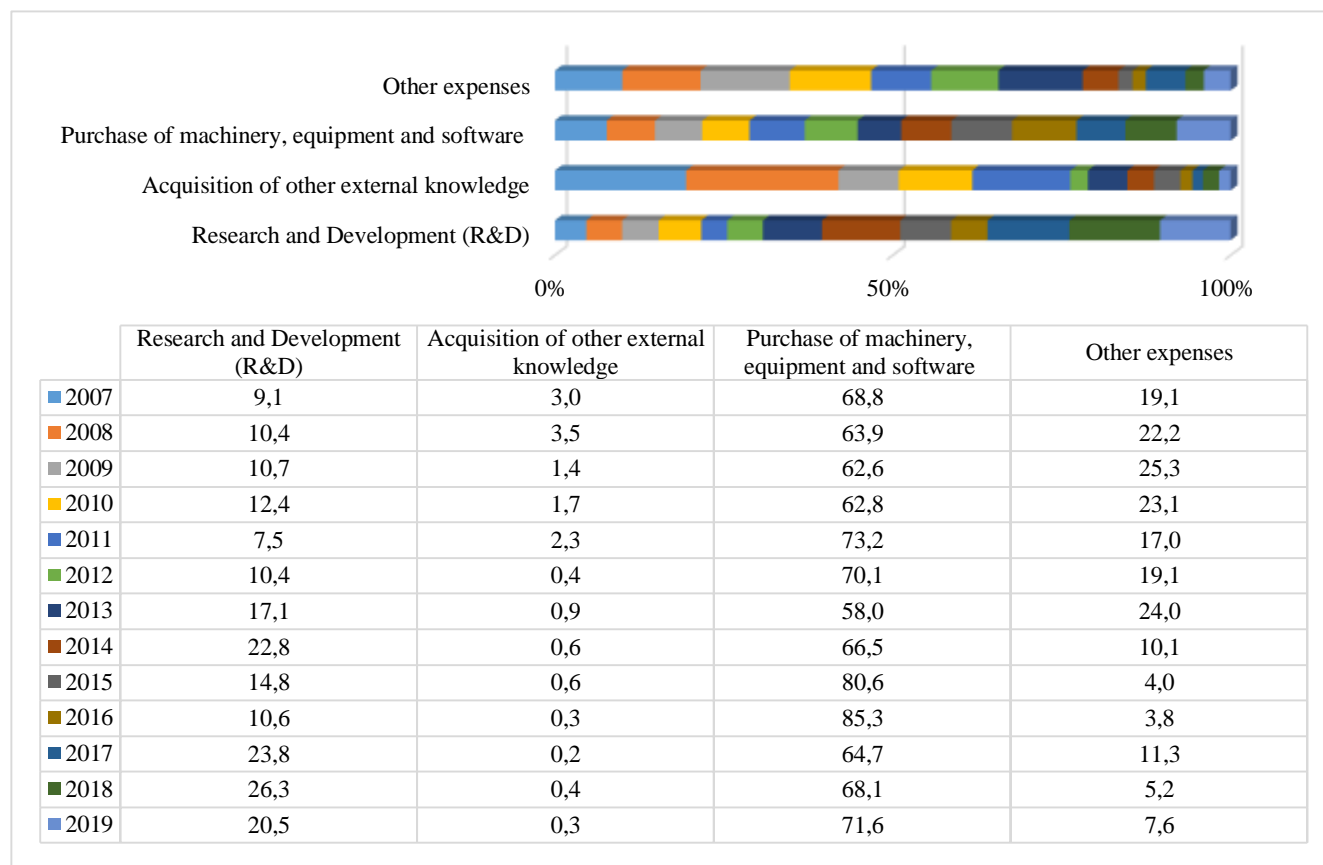
	Research and Development (R&D)	Acquisition of other external knowledge	Purchase of machinery, equipment and software	Other expenses
2007	9,1	3,0	68,8	19,1
2008	10,4	3,5	63,9	22,2
2009	10,7	1,4	62,6	25,3
2010	12,4	1,7	62,8	23,1
2011	7,5	2,3	73,2	17,0
2012	10,4	0,4	70,1	19,1
2013	17,1	0,9	58,0	24,0
2014	22,8	0,6	66,5	10,1
2015	14,8	0,6	80,6	4,0
2016	10,6	0,3	85,3	3,8
2017	23,8	0,2	64,7	11,3
2018	26,3	0,4	68,1	5,2
2019	20,5	0,3	71,6	7,6

Fig. 3. Share of expenditures on innovation of industrial enterprises by areas of innovation activity during 2007–2019, %.
Source: built by the authors according to Expenditures on innovation of industrial enterprises by areas of innovation activity (2020)

It should be noted that as of 2019 15.8 % of national economic entities were engaged in innovation activities. 2 % fewer enterprises implemented innovations. The share of the volume of sold innovative products is at all insignificant. In 2019, it corresponded to the value of 1.3 % of the total volume of products sold by industrial enterprises. According to sample surveys, the share of national innovatively active small business entities does not exceed 18.4 %, which is due to the influence of a number of restraining factors, such as: financing problems (lack of own funds, difficulty in attracting financial resources from market sources: strict credit conditions, insufficient financial support from the state, the difficulty of attracting investors); immaturity of innovation infrastructure; imperfection of the technology market; lack of systematic information regarding the condition and forecast assessment of the market of innovative products; low level of innovation potential of small business entities; high probability of risks from the implementation of innovative activities; low effective demand for Ukrainian innovative products.

According to the results of the state statistical survey "Survey of innovation activity of industrial enterprises" (2015), for national economic entities, own funds are the main source of financing of innovation expenditures: as of the end of 2019, this indicator reaches UAH 12,474.9 mln (87.7 % in the cost structure). It should be noted that the volume of foreign investment corresponds to UAH 42.5 mln or 0.3 %; 3.9 % are provided by state and local budgets; 8.1 % are funds coming from other sources. Thus, the financing of innovation expenditures is one of the most pressing issues of national small business entities, given their limited ability to finance innovation costs from their own funds.

5. Discussion

The use of the principles of business economics, among which the principle of effective interaction of large and small business is important, is one of the key conditions for sustainable development and integration of the modern economic system of Ukraine into the world economic system.

It should be noted that in the difficult conditions of globalization, the selection of the European path of development and accession of Ukraine to the World Trade Organization, representatives of Ukrainian business behave differently. Large corporations enter international markets, participate in the internationalization of high technologies. Medium-sized enterprises are more focused on the domestic market and depend on the economic policy pursued by the state.

Small enterprises are mostly connected with local markets, cover almost all areas of production of goods and services at the regional and domestic levels, have high level of adaptability and are most interested in the policy of effective government regulation and business support, creation of a favorable business environment. But at the same time, both large corporations and medium and small enterprises work closely together.

Thus, in our opinion, intensification of the interaction of small, medium and large enterprises, i.e. their economic integration, should be one of the ways to address the issues of development of small business and increase the efficiency of its potential, which will contribute to the development of small business entities in a crisis, increase in production and sales of its products and services, extension of the life cycle of a business and provision of its sustainable operation as a competitive business entity.

In turn, large enterprises also expect positive results from this cooperation, including: minimization of the number of production and sales operations, which affects the reduction of costs, the process cycle and the price of manufactured products (Belitski et. al (2019)).

Therefore, based on the above, we can draw a general conclusion that the integration of small, medium and large business should be considered a business association of commercial and non-profit organizations and individual businessmen interacting in the process of creation and sale of products (services) and related integration relations as:
- members of business associations can be commercial and private non-profit organizations, including those that successfully carry out their activities in the field of social services;
- product-commodity is, as a rule, the unifying feature of integration production associations;
- integration interactions of participants are not limited to participation in the authorized capital, implementation of targeted programs, but cover all areas and directions of their cooperation.

Since in the economy integration of small, medium and large enterprises is a controlled process of their interaction, which has organizational-management, production-technological, and economic-legal aspects, the structure of business associations should be divided into partnership and management forms. As a result of a low level of capitalization of small enterprises, their participation in partnership forms of integration is limited and may not always give the expected result.

Management forms of integration, which include network and cluster subtypes, are more attractive to small business entities. Thus, there have become widespread such forms of production functional integration relations as subcontracting. In production and sales relations it is franchising, in production-financial relations it is leasing, and in the area of innovation it is venture financing.

The positive effect of the operation of business associations is also observed in the development of economies of EU member states. As you know, in the EU member states, small enterprises create 50 % of jobs and account for almost 40 % of sales, while medium-sized enterprises provide employment for 17 % of the able-bodied population and produce almost 18 % of the total volume of sold products (Yan, J., & Yan, L. (2016)).

Effective use of the potential of small and medium-sized business was facilitated, in addition to significant government support, by their broad interaction with large corporations, when small enterprises act as satellites and ensure the implementation of separate parts of production processes, the manufacture of small-scale products to ensure the activities of large enterprises. Active participation of small and medium-sized enterprises in industrial production characterizes the innovative orientation of business development in the countries of the European Union (Burch et. al (2016)).

It should be noted that the interaction of small and large business, in particular, is necessary when placing orders for the production of some parts, which are needed by large companies, in small enterprises. Many large corporations place their orders in small enterprises located in less developed countries, which helps to save money of the companies and replenish the budgets of these countries. This is the principle of many large enterprises engaged in the production of consumer electronics, clothing, footwear.

Moreover, the potential of a small enterprise can be used in software development, software application testing, and in the organization of service of products manufactured by large enterprises. Successful large companies prefer not to keep system administrators on the payroll and instead conclude agreements with small enterprises for the maintenance of computers and office equipment.

Conclusions

Among the main strategic priorities for economic growth, modernization of regional development of Ukraine is the shift of emphasis on the identification of the internal potential of the regions, the introduction of effective mechanisms and tools to stimulate local and regional development, intensification of business activity. Therefore, identifying ways to improve the efficiency of small business potential as an important structural element of the economic system is one of the preconditions for sustainable economic growth.

Based on the the characteristics and specifics of economic activity of national small business entities previously substantiated in the paper, as well as taking into account the negative trend of recent years to reduction of their innovation activity, the innovative dominants of development were formed: improving the process of conducting statistical surveys and recording indicators of innovation activity separately for SBEs; formation of innovation policy for the small business sector at all levels of government; introduction in the national program of small business of the section on development of innovative activity with the substantiation of priority of its areas and volumes of the financial means necessary for ensuring financial-credit support of SBEs; further development of innovation infrastructure; tax incentives for innovative activity of small business enterprises.

Improvement of the organizational and economic relations of small enterprises with large and medium enterprises was determined as one of the directions of increasing the efficiency of small business potential, and the formation of an integration model of business associations as a set of possible forms of interaction of small, medium and large enterprises and areas of integration was suggested taking into account the level of small business capacity and its activity regarding the operation of these forms in ensuring more efficient use of its potential.

Among the most attractive and possible areas of economic integration of production activities with large companies where small business can intensify the use of its potential, there were identified production-

technological, scientific-technical and economic-legal areas of their interaction, within which such forms of cooperation as franchising, leasing, clusters, industrial parks and others can be used.

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Irina SKURATOVYCH, Ph.D in Law, Associate Professor, Yaroslav Mudryi National law University
ORCID ID: orcid.org/0000-0002-1355-7022

Nataliia LYTVYN, Doctor of Law, Professor, Professor Department of Administrative Law and Process and Customs Security, State Fiscal Service University of Ukraine
ORCID ID: orcid.org/0000-0003-4199-1413

Iryna PANOVA, Ph.D. in Law, Associate Professor, Head of the Department of Law Enforcement Activity and Policeistics, Kharkiv National University of Internal Affairs
ORCID ID: orcid.org/0000-0003-4325-5428

Ievgen OVCHARENKO, D. Sc. (Economics), Professor, Volodymyr Dahl East Ukrainian National University
ORCID ID: orcid.org/0000-0001-5267-5067

Olena HRYHOREVSKA, PhD in Economics, Associate Professor, Kyiv National University of Technology and Design
ORCID ID: orcid.org/0000-0001-8279-3523

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HOW COMPANIES OVERCOME CRISIS THROUGH THE SHARING OF INFORMATION AND TEAMWORK PERFORMANCE DURING THE COVID-19 PANDEMIC[*][†]

Nadežda Jankelová [1], Zuzana Joniaková [2], Jana Blštáková [3*], Katarína Procházková [4], Zuzana Skorková [5], Lasha Abuladze [6]

[1,2,3,4,5] *University of Economics in Bratislava, Dolnozemská cesta 1, 852 35 Petržalka, Slovak Republic*

E-mails:[1] nadezda.jankelova@euba.sk ; [2] zuzana.joniakova@euba.sk ; [3] jana.blstakova@euba.sk (Corresponding author); [4] katarina.prochazkova@euba.sk; [5] zuzana.skorkova@euba.sk; [5] lasha.abuladze@euba.sk*

Abstract. The goal of our research was to determine how crisis management competence affects employee performance of teams and the conditions in the acute stage of the crisis during the pandemic. We have used the mediator model to identify the relations. The study was carried out on a research sample of 122 companies after the outbreak of the COVID-19 pandemic in Slovakia (March - April 2020). The respondents in the research sample were managers at different company levels. The study tests the positive association between leadership

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in crisis and employee performance of teams, which is mediated through the sharing of information, team organization of work and cognitive diversity, supporting crisis management competency. The research results prove that employee performance of teams during the acute stage of the crisis may be positively affected through crisis management competences amplified by information sharing and team cooperation. The study contains knowledge important for managing company competitiveness, because it introduces demonstrable findings on the content of crisis management competences in relation to employee performance. The study results are internationally relevant and the content of the discussion applicable, because the pandemic has hit globally regardless the political or economical borders.

1. Introduction

Companies and the entire business sector was hit by the COVID-19 crisis rapidly and unexpectedly. Social distancing has been the cause of fundamental change of the conditions of economic activity. Retail stores, restaurants, coffee shops, hotels, sports facilities, theatres and cinemas remained closed during the acute stage of the crisis without a prospect of future activity. The production sector limited its production activities, as it was necessary to tighten hygiene measures and change organization of work, which moved to the employees' homes to a great extent. Companies have strived to utilize the potential of the online environment in their work systems. COVID-19 has presented an acute need to utilize the possibilities of the online environment in the business sphere and to immediately react to the current needs of the customers and employees. To manage a crisis is to manage change, whereby the human factor plays a significant role in the management of changes, which is the determinant of success/failure in the implementation of decisions, communication strategies and the reach of leadership in crisis (Hutchins & Wang, 2008).

According to the PwC study (Global Crisis Survey 2019), 7 out of 10 managers have experienced managing a crisis in a company over the past 5 years. Therefore in general, it is not necessary to think about whether a crisis will happen, but when it will happen. In the case of Coronavirus it must be noted that it is a specific crisis caused by external conditions, for which many companies were not and could not have been prepared. For some time, COVID-19 changed not only organizations' work, operative management, but the overall mood, enthusiasm for work and access to everyday activities as well. Preparedness for any crisis seems to be for the foreseeable future a strategic competitive advantage for companies worldwide. Companies cannot avoid any type of crisis, however, they can face it and purposefully use all of the possibilities and the environment the crisis introduces.

Based on the study of Reeves et al. (2020) the most important areas for business to manage in Coronavirus crises are focused on communication and employee needs, but also on diversity and redundancy, which are helping to develop resilience. Argenti (2020) also points to communication as a crucial activity in coronavirus pandemic, according his opionion; the companies have to demisfity the situation for employee, and support and provide hope for the future. Focusing on communication, there is also another crucial element of effective communication during crisis, and it is transparency (Edmondson, 2020). Transparency helps to create a team culture based on trust, and in regard of effective teamwork, trust is key element that is developing team spirit and strong and clear relationship among team members. Based on research by Lencioni (2002) lack of the trust is one of crucial dysfunctions of a team.

Effective people management and use of optimum leadership tools seem to be the key for managing the crisis state. Crisis management creates pressure on using transformational leadership with a focus on charismatic

leadership (Johnson, 2020), however, with an emphasis on maintaining strength and unity of leadership tools (Jacobides, 2020). At the same time, it creates pressure on higher and top management, which should focus on transparent provision and immediate sharing of information, open communication and acceptance of non-conforming solutions (Gardner & Peterson, 2020). Many studies examine the content of quality leadership and point out the importance of cognitive diversity of the leadership and inclusion as a value of learning teams (Chow, 2018). They define the relation between cognitive diversity and performance as complex, affected by the structure, roles and interaction of the subsystems (Jiang & Zhang, 2014). Based on the published studies, we consider it important to examine cognitive diversity, the ability to share information and facilitation of team cooperation as key qualities of crisis management, where we assume positive association with team performance. Based on current knowledge and identification of gaps in the research of corporate management, we have formed the research design for the purposes of this study.The main aim of our research is to identify the impact of competent crisis management of business entities on employee performance in teams, which was necessary to manage the COVID-19 crisis in its acute stage. The first COVID-19 case was recorded in Slovakia at the beginning of March 2020. We collected the research data during March and April 2020. We have examined the mutual relation between the crisis management competences, responsible decision-making in a business crisis situation and employee performance, whereby we assume that the competences of crisis management are positively related to employee performance through information sharing, teamwork and cognitive diversity of work teams.

We have examined the mutual relations between these variables during the initial stage of the pandemic (March-April 2020), i.e. during its acute stage. We were therefore able to assume highly authentic respondent reactions. Given this fact, we consider the obtained information to be of high importance, since it was not affected by additional acquisition of knowledge from the field of crisis management, but it uncovered the actual skillset of the addressed corporate managers in the context of managing the crisis caused by the Covid-19 pandemic.

2. Theoretical background

The crisis caught corporate management by surprise during the initial stage of the 4.0 Industrial Revolution. Fundamental changes are happening in the ever-changing business world. The current global pandemic situation caused an enormous pressure on corporate management during the crisis. The question arises about how much the companies were prepared for this situation, if they were prepared at all? How were they capable of effectively handling it under the extreme conditions and with existing resources? What proven tools and techniques implemented during the current crisis management can they implement also during the latter, post-pandemic operation?

The research of corporate management assumes that the COVID-19 situation is not a one-off matter (Reeves, et al. 2020). Being prepared for change and new situations means that we understand and analyze the current situation and decisions, which were implemented, and management tools and techniques, which were used and implemented and worked effectively. The COVID-19 crisis also initiated changes in the labour market. The situation in the world of work 4.0 was the starting point. The research focused on the virtualization of the labour market demonstrates a decrease of the level of central control and higher level of flexibility (Haak-Saheem, 2020). Changes expected in the business models have a strong impact on work systems. One of the initial fears, expressed by the experts on the 4.0 sectors, is the shortage of qualified workers (Gilchrist, 2016; Shevyakova et al., 2020). Today, the main subject of discussions regarding changes in the field of employment is the question of adapting skills and competences of employees from work in the online environment. During the pandemic, communication platforms, remote access and intelligent work places were coming to the forefront. It is difficult to say whether the digital age creates opportunities especially for the qualified workers, but the need for greater specialization, flexibility and adaptability and the potential smaller breadth of expertise and skills will be very

different. However, in general, the virtual environment causes an increase of demands for employees in the form of responsibility in decision-making (Papula et al., 2019).

Several studies show that in the context of effective crisis management, especially during the acute stage of the crisis, major factors of its successful management include especially effective communication (Kim & Lim, 2020; Clementson 2020), use of suitable people management style (Richardson, 2019; Grant-Smith&Colley, 2018; Kapucu & Ustun, 2018), ability of adequate decision-making (Savi & Randma-Liiv, 2015), (Stanton, 2014), and the establishment of an effective crisis team and sharing of information within (Uitdewilligen & Waller, 2018; Lee et al., 2007). The joint effect of these factors is the precondition for the successful management of difficult conditions and preparation for new, often changed, post-crisis operation. The reaction to the crisis determines the way of recovery and the future of business performance (Bowers et al., 2017). These aspects (communication, teamwork, people management style, decision-making, information sharing) affect the work performance of teams. During the acute crisis stage, it can be assessed through the feeling of satisfaction, safety and conditions for work (Kash et al., 2018). During the stage, communication becomes a strategic element to maintain the reputation of the business (Flores et al., 2019). As the authors of this study argue, the commitment of the employees to the company is reinforced by communication taking place in the form of constant and honest dialogue. The author of the normative crisis communication emphasizes that true and relevant information is its foundation and that information overflow is harmful (Clementson, 2020). The expansion of the impact of social media represents a new era of crisis communication (Cheng, 2020). During the crisis, the companies used the dynamic environment, in which it was important to effectively work with information. During the crisis, the employees often encountered oversaturation of information, incomplete information, or the combination thereof, which led to reduced quality of decision-making and subsequently lower performance. Authors point out the critical increase of the volume of data for decision-making. Kostyuchenko et al. (2020) add that there is extreme uncertainty in companies linked to methodological inaccuracies in the application of models and concepts. Kim & Lim (2020) presented an important practical implication for crisis management, where they emphasized, the key ability of the leadership to activate and enforce positive behaviour of employees by reinforcing the voice of the employees. According Markman (2020) in today times of uncertainty and fast changing environment it is strategic to focused on making a better decision and slow down. Usually in uncertainty and under the anxiety people tend to make shor-sighted decisions, but, at the other hand, if companies and leaders are able to take a time to process data, understand information and choose an optimal variant, the suitable decision can be made.
A recently research also stated that during Coroana crisis, especially remote teams, were able improve conversations and have started to be more focused and less subjective, and the final impact was increasing productivity (Walsh, 2020).

Tourish (2020) objects that the COVID-19 pandemic is also a crisis of leadership theory and practice. He compared decision-making to gambling, where the leadership has weak knowledge unproven by research. The crisis situation we are currently facing often creates an environment especially for populist (Schneiker, 2020) and destructive leadership (Brandebo, 2020) and he also draws attention to the fact that the crisis managers are not always equipped to manage relations, which may have negative consequences from the long-term perspective.
There is a general agreement between the academic community and practicing experts that cooperation is necessary to manage complex risks and events, with which none of the stakeholders deal with all by themselves (Parker et al., 2020). The effective management of a crisis - defined as a situation or an event, which threatens the fundamental values and requires pressing measures related to the uncertainty - requires for the entities with decision-making power and the participating organizations to come together and contribute to the specific stages and activities, which represent crisis management, including preparation, mitigation, reaction, restoration and learning from it (Boin et al., 2017).

The performance of the crisis management team depends on the abilities of the members of this team, as well as on situational assessment, communication and team cooperation Coombs (2007) points out the fact that the

members of the crisis team have to have decision-making authority. Olaniran & Williams (2001) state that crisis management is a process of collective decision-making. Jehn & Techakesari (2014) state that human factors and team processes play the key role in the improvement of reaction speed, accuracy and effectiveness of team members.

Based on the knowledge published in the above-mentioned theoretical framework, we see a research gap in the content of competent crisis management in relation to employee performance in teams. The published studies often stated communication skills, leadership and decision-making as important skills. We have used these to create the initial variable called crisis management competences (CMC). All items, which are part of the CMC are presented in Table 1. We have situated the research in the acute stage of the Covid-19 pandemic crisis, in the environment of digital transformation of companies. We assume that the quality of crisis management is linked to the employee performance during the crisis, and therefore we test how this effect is realized in the new environment, in the conditions of social distancing and urgent need for a new balance. Based on the knowledge presented above, we assume that during the crisis, employee performance will be positively affected if crisis management includes people with different skillsets, knowledge and values. We further assume that the availability of information about the crisis and how the interpretation of this information positively affects the employees' attitudes to work and the consequences for the business. We further assume that employee performance positively affects the ability to cooperate at a certain level of autonomy. We have therefore tested the effect of teamwork. Based on these assumptions, we have compiled a mediator model to test if the crisis management competences (CMC) affect employee performance in teams during the acute stage of the crisis through information sharing, use of teamwork and cognitive diversity of the crisis management. The research results will help to identify important relations for the selection of people management tools during a crisis, and to better focus the effort to restore balance.

3. Research objective methodology and data

Based on the current knowledge and identification and definition of the gap in the research of corporate management during a pandemic crisis, we have formed the research design for the purposes of this study.

3.1 Research model

Research question: What is the impact of competent corporate crisis management on the management of the COVID-19 crisis in its acute stage?

Main research goal: Test the relations between the crisis corporate management competences (CMC) and employee performance (EP), measured during the acute stage of the crisis.

Partial research goals: Determine which elements of competent crisis management and to what extent they affect team performance measured through the feeling of satisfaction, safety and conditions for work.

We have formed the main research hypothesis as follows (Figure 1):

H: The dependency between the CMC and employee performance in teams (EP) is mediated through information sharing (IS), teamwork (TW) and cognitive diversity of crisis management (CD).

To test the main hypothesis, we have used seven partial hypotheses.

Hypothesis1: CMC are positively linked to TP.

Hypothesis 2: CMC are positively linked to IS during a crisis.

Hypothesis 3: IS during a crisis is positively linked to TP.

Hypothesis 4: CMC are positively linked to the level of TW during a crisis.

Hypothesis 5: The level of TW during a crisis is positively linked with TP.

Hypothesis 6: CMC are positively linked to the level of CD of crisis management.

Hypothesis 7: The level of CD of the crisis management is positively linked to TP.
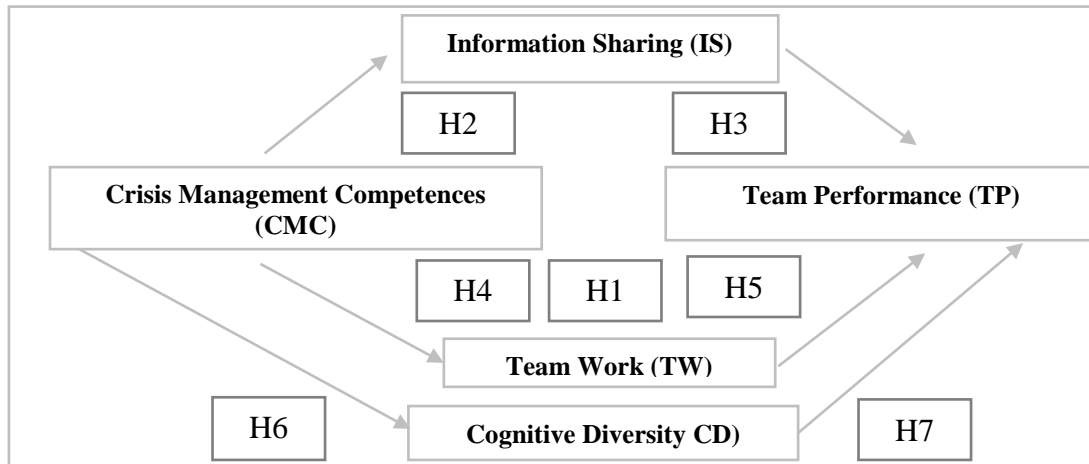
Figure 1. The Mediation Model and the Seven Tested Hypothesis.
Source: own research

We have used the SPSS 22 software package to analyze the data. The reliability of the defined sets of items for individual variables (CMC, TP, IS, TW, CD) was tested using Cronbach's Alpha coefficient. The correlation analysis was used to test the relations between the sets of items, compiled to assess individual variables. Subsequently, the mediator model according to Baron and Kenny was used and Sobel's test was used to test the mediator effect. Finally, the regression analysis was used to test the proposed hypotheses. Control variables were the size of the organization based on the number of employees, gender and age of the manager, his position in the management hierarchy and years of experience in a management position. We have used the ANOVA variance analysis to analyze multiple dependency. We have worked at a significance level of 5%.

3.2 Measures

We have used the mediator model to test the relations between the crisis management competences (CMC), team performance (TP) and mediating variables of information sharing (IS), team work (TW) and cognitive diversity (CD). We use mediation, because thanks to it we can examine the causal relations between the variables and engage other variables in the basic relation to examine processes, which occur between the identified variables, better and more deeply. CMC represent an independent explanatory variable. This variable is operationalized as a score based on the corporate crisis management rating received for 3 items - crisis communication, management style during a crisis and decision-making during a crisis. Every rated item consisted of partial items (Table 1). Overall, the CMC independent variable contains 26 items, which are scaled using the 5-point Likert-type scales (1='strongly disagree' and 5='strongly agree'). After the reliability analysis, the Cronbach's Alpha of the CMC was 0.979 (26 items).

The second variable, understood as a consequence, is the team performance (TP) dependent variable. According to the study of Kasha et al. (2018), items identifying team performance/efficiency depend on the environment and situation, in which the performance is measured. The crisis that entered the development of the value-framework

of people management is a crisis of health and safety first, and then a crisis of business with an impact on the business economic indicators. Humanity, trust, health, activity and transparency are activities that came to the foreground during the pandemic (Chetan Chaudhari, 2020). During the stage of acute crisis, it is not possible to measure team performance through quantitative indicators, since they are not yet available. The precondition for the effective operation and performance of a team during a crisis is the establishment of such conditions for its operation, which would lead in the subsequent crisis stage of process assessment and formulation of recommendations for the future to measurable results at a high level. The team performance variable is operationalized as a score assigned to individual items, representing satisfaction at work, feeling of safety and quality and safe working conditions. We have used the Safety Attitudes Questionnaire (SAQ), which was validated by many researchers, and which was developed specifically for the purpose of examining management opinions on the questions of teamwork, from the perspective of teamwork climate, job satisfaction, perceptions of management, safety climate, working conditions and stress recognition even in extraordinary situations, which the current pandemic no doubt is (McGuire et al., 2013). After the reliability analysis, the Cronbach's Alpha of TP was 0.944 (17 items).

The level of information sharing during a crisis (IS), team nature of work (TW) and the level of cognitive diversity of the work teams (CD) we identified as the mediating variables. An independent variable is the cause for the mediating variable, which is then a cause for the dependent variable (MacKinnon, 2008). Individual mediating variables are operationalized as a score acquired based on the assessment of items, we have extracted from the above-mentioned literature research (Table 2). After the reliability analysis, Cronbach's Alpha of mediator variables has proven the relevancy of individual items: IS: 0.932 (10 items), TW: 0.815 (9 items), CD: 0.84 (4 items).

The relation between the variables CMC, TP, IS, TW and CD may be affected also by external, so-called control variables. For control variables, we have subsequently tested their effect in the course of the basic examined / model relation.

We have used a questionnaire survey to collect data. The questionnaires were sent electronically to corporate managers in Slovakia. For the objective assessment of management skills of crisis managers during the stage of acute crisis, the questionnaires were sent and collected during the first months of the crisis (during March and April 2020), whereby the first Covid-19 case in Slovakia was confirmed on March 6, 2020. The research sample consisted of 122 companies. The respondents were managers at different levels with different amounts of management experience (team leaders, middle management, higher management). In terms of size of the companies, based on the number of employees, companies with more than 250 employees were the most numerous in the research sample (63.9%), followed by companies with 50 to 250 employees (19.7%), and small companies with less than 50 employees (16.4%). The questionnaire survey has been carried out throughout Slovakia. From the regional perspective, the research sample is the most telling about the situation in the Bratislava region (65.6%), while other regions were represented to a lesser degree. Based on the sector, the research sample consists primarily of companies operating in the tertiary sector (services, transportation, trade) (54.1%), followed by companies from the quaternary sector (education, research, technology) (29.5%), secondary sector (processing industry, construction) (13.1%), and the primary sector (mining, agriculture, energy) (3.3%). The structure of the respondents based on the basic demographical characteristics is shown in the table.

4. Results

We have determined the relations between the individual variables by creating a correlation matrix. For its creation we have created summary variables – CMC, TP, IS, TW and CD and we have determined the overall average score of the relevant items. The matrix also includes control variables. The descriptive statistics and the correlation matrix itself is presented in Table 1.

Table 1. Correlation Matrix.

	Mean	SD	N	CMC	TW	IS	CD	TP	Gender	Edu-cation	Age	Exper ience	Job
Competences	3.81	.92	122										
Teamwork	3.62	.71	122	.758**									
Information	3.79	.93	122	.844**	.663**								
Diversity	3.65	.86	122	.061	.268**	-.017							
Result	3.81	.77	122	.779**	.728**	.843**	.062						
Gender	1.41	.49	122	-.276**	-.080	-.287**	.002	-.148					
Highest Completed Education	2.67	.72	122	.021	-.014	.179	-.108	.187**	-.084				
Age	2.38	.91	122	-.075	-.034	.105	.113	.019	-.309**	.542**			
Years of Experience	2.80	1.22	122	-.198**	-.215**	-.042	.008	-.165	-.222**	.378**	.812**		
Current Job Position	1.97	1.23	122	.013	-.019	.111	-.027	.098	-.086	.155	.423**	,414**	
Number of Employees in the Business	3.39	.95	122	.054	-.111	.154	-.269**	.134	-.100	.118	.056	-.090	-.187**

Source: own research

Note. CMC = Crisis Management Competences; TW = Team Work; IS = Information Sharing; CD = Cognitive Diversity; TP = Team Performance;**p > .05.

The correlation matrix indicates that there are significantly positive correlations between all five examined variables, which indicates the use of the mediator model. In mediation we have started with the set main hypothesis.

H: The dependency between the crisis management competences and team performance is mediated through information sharing, teamwork and cognitive diversity of crisis management.

We have proceeded in three steps (A, B, C), in which we will verify the partial hypotheses by calculating three regressions.
C) There is a relation between team performance (Y) and crisis management competences (X).
A) There is a relation between the mediator variable (M) and crisis management competences (X).
B) There is a relation between team performance (Y) and mediator variable (M), on which X does not participate.

Where C represents the overall effect. The multiplication of A*B is mediated through the (indirect) effect of X on Y through M. The difference C' = C – A*B is the net (direct) effect of X on Y without the participation of M.

The hypothesis is true when the indirect effect is significant, meaning if A*B = C - C' is significant (use of Sobel's test). We have added the control variables of age, gender, years of experience and position of the manager and the size of the organization into the modeling of the overall effect. We have used the ANOVA variance analysis to analyze multiple dependency. We have worked at the 5% significance level and the obtained results are presented in Table 2. Since we are working with three mediator variables, we will divide the structure of the model into three parts - i.e. three paths, through which the indirect, meaning the mediated relation, will pass

through every mediator. A path for a direct relation is also part of the model. The breakdown of the variance for the overall dependence on the initial model has shown that no control variable was significant (p-value < 0.05).

Table 2. Parameter Estimate.

Step C: (Dependent Variable: TP)						
Parameter	B	Std. Error	t	Sig.	Lower Limit	Upper Limit
Intercept	.705	.237	2.972	.004	.235	1.175
CMC	.688	.047	14.613	.000	.595	.782
Steps A1. A2. A3: (Dependent Variable: **TW**)						
Parameter	B	Std. Error	T	Sig.	Lower Limit	Upper Limit
Intercept	1.544	.241	6.412	.000	1.067	2.020
CMC	.565	.048	11.825	.000	.470	.660
(Dependent Variable: **IS**)						
Parameter	B	Std. Error	T	Sig.	Lower Limit	Upper Limit
Intercept	.018	.250	.072	.943	-.478	.514
CMC	.843	.050	16.964	.000	.744	.941
(Dependent Variable: **CD**)						
Parameter	B	Std. Error	T	Sig.	Lower Limit	Upper Limit
Intercept	3.713	.448	8.290	.000	2.826	4.600
CMC	.075	.089	.841	.402	-.101	.251
Steps B1. B2. B3: (Dependent Variable: TP)						
					95% Confidence Interval	
Parameter	B	Std. Error	T	Sig.	Lower Limit	Upper Limit
Intercept	.197	.238	.826	.411	-.275	.669
CMC	.077	.076	1.012	.313	-.074	.227
TW	.374	.075	4.981	.000	.225	.523
IS	.476	.068	7.004	.000	.342	.611
CD	-.021	.040	-.517	.606	-.101	.059

	Overall Indirect Effect		Indirect Effect Mediated through Mediators:			
			M1 (**TW**)	M2 (**IS**)	M3(**CD**)	
A*B	0.611	Ai*Bi	0.211	0.402	-0.002	
z	5.491	zi	4.591	6.474	-0.440	
Sig.	0.000	Sig.	0.000	0.000	0.660	

Effect size of individual parts of the overall structure of the model:		
Effect	**Coefficient**	**%**
Total	.688	100%
Direct	.077	11%
Indirect	0.611	89%
Indirect through M1	0.211	
Indirect through M2	0.402	
Indirect through M3	-0.002	

Source: own research
Note. CMC = Crisis Management Competences; TW = Team Work; IS = Information Sharing; CD = Cognitive Diversity; TP = Team Performance; p > .05.   Lower Limit and Upper Limit are in the 95% Confidence Interval

The results in Table 2 show that the overall indirect effect is significant in the positive direction, just like 2 items of the indirect effect that are mediated through individual mediating variables are significant in the positive direction (teamwork and information sharing). The cognitive diversity mediator was not significant. Since the direct effect is not significant and indirect effect is greater than 80% of the overall effect, we can declare complete mediation. Almost 90% of the overall effect of crisis management competences on team performance are mediated by individual mediating variables, of which information sharing has the greatest effect, which has twice the intensity of teamwork. The effect of cognitive diversity has not been verified.

5. Discussion

We have found that the relations expressed through steps A and B are significant for 2 mediating variables, meaning there are relations between teamwork (M1) and sharing of information (M2) and crisis management competences (X) and that there are also relations between team performance (Y) and two mediating variables (M1, M2), on which X does not participate. Due to the significance of these relations, there is an assumption for the existence of mediation.The multiplication of A*B is significant, so the indirect effect of crisis management competences (X) and team performance (Y) through the measured information sharing and teamwork was confirmed. The hypothesis was confirmed. Direct effect is not significant, the overall effect is mediated. Expressed in percentages, we can see that approximately 89% of the overall effect falls onto the indirect effect. Since the indirect effect reaches more than 80% of the overall effect, it is complete mediation.

The hypothesis on the dependency between the crisis management competences and employee performance, which is mediated through the sharing of information and teamwork has been confirmed. Complete mediation has been identified, where the mediator variables mediate more than 80% of the effect. This is a significant finding; specifically that crisis management has an effect on performance through the sharing of information and support of teamwork. Based on research results we state that cognitive diversity of crisis management does not support the effect of crisis management competences on employee performance of teams. Crisis management competences have to be formed in a different way. Our findings are in line with many studies and findings presented in scientific literature, where significant factors for crisis management, especially during its acute stage, are efficient and effective communication (especially internal), selection of suitable management style, flexibility of decision-making, establishment of an effective crisis team and sharing of information within it (Pearce et al., 2020; Bhaduri, 2019; Bowers et al., 2017). Research results have confirmed that support, interest and space for learning from mistakes are important for employee performance in teams during the acute stage of the crisis. Employees are interested in business recovery, pride of own work remains and the crisis reinforces morale in the workplace. Autonomy, feedback and space for critical thinking are important for employee performance. Teamwork as a form of work organization is a supporting element of employee performance during the acute stage of the crisis. Team organization of work during the crisis creates a better environment for questions, mutual support in performance, better coordination and joint search for answers to crisis problems. The research has shown that the competency to lead people during a crisis means creating an environment for teamwork (cooperation), which in its essence includes especially delegating and strengthening of autonomy.

The research has shown that information sharing is the most important of the tested variables. Communication is the most important tested variable in the effect of competent crisis management on performance. The sharing of information in the form of providing information and creating an environment for the sharing of information explain, based on the results, the greatest effect of crisis management on employee performance in teams. The respondents have often ranked sufficient information, explanations, directives and positive aspects of the crisis

state as important. Additionally, there was sincerity, honesty and transparency of communication. Two-way communication and openness in communicating uncertainty, opinions and solutions were also often stated.

Our assumption that diversity of knowledge, which may be used in qualified decision-making during the acute stage of the crisis was not verified. The research did not prove the effect of cognitive diversity of crisis management as an important factor for employee performance.

6. Conclusions

In the digital age, during the COVID-19 pandemic crisis, the society is at the beginning of its path from the physical world to the virtual world. The only certainty on this path is the certainty of change, and because biological evolution is slow, the state of uncertainty remains the greatest source of stress for a person. Social distancing caused fundamental changes of economic activity during the pandemic and business sustainability became the main task of people management. This will most likely lead to permanent changes in corporate management. Through a thorough understanding of causal relations regarding corporate management in the context of the crisis, we can better anticipate the consequences and prepare for opportunities. The conditions of the 4.0 Industry era have prepared the best possible environment for the viability of businesses during the time of social distancing and whether they are prepared to operate in the virtual environment. Using the available published studies on management during the crisis, we have identified the content of crisis management competences and we have defined the relations to employee performance in teams during the acute stage of the crisis.

6.1 Practical implications

The research has confirmed that competent crisis management affects employee performance in teams through information sharing and team organization of work. Cognitive diversity of crisis management does not prove its competence, affecting employee performance in teams. We consider this the fundamental finding of this study. It seems that diversity of knowledge and value foundations of the leadership is not important for the positive effect of crisis management on employee performance, quite the contrary. The employees require value-consistent leadership, without demands for specific knowledge, which informs them reliably and allows them to cooperate. The results show that information and an environment for quality team cooperation are important for team performance during the acute stage of the crisis. From the perspective of the effect on performance, it is not very important, if the crisis management consists of people of different opinions, different knowledge or perspectives on the source of truth. The feeling of safety, good morale and engagement of employees during a crisis is dependent more on reliable and transparent information, empathy, expression of interest and especially on the conditions for the joint search for a way out of the crisis. The research has confirmed that people need access to information and autonomy to decide and cooperate to perform during the crisis. The practical implications of the research are: (1) Leadership during a crisis supports employee performance, if the crisis management is competent, trustworthy and restores certainty. (2) Crisis management competences positively affect performance through information sharing and transparency of decisions. (3) Crisis management competences positively affect performance through the strengthening of autonomy at the level of teams and supporting team cooperation. (4) Crisis management competences are not supported by the cognitive diversity of the crisis management, on the contrary, consistency of opinions is a source of certainty and transparency of management decisions. (5) Communication and cooperation are important tools for managing employee performance, which were defined by the pandemic crisis, and on which the potential of the virtual environment can be focused.

Our research contributed to the existing knowledge through the finding of the importance of management competences during a crisis. We consider these findings to be valuable for the business practice, especially for the management during the stage of acute crisis. According to the published studies, the relation between psychological safety of employees and business performance has been verified (Edmondson, 1999). The path to psychological safety begins with open communication about problems. The basis is the absence of fear, allowing

to express opinions and present new ideas. High level of uncertainty is a source of stress, which inhibits the capacity to think creatively and act rationally. Fear is a source of shortcuts in peoples' thinking and it leads to simplified solutions. Anger is a source of energy and forces people to act. During the crisis, fast and simple solutions do not have to be a safe path to prosperity. During the acute stage of the crisis it is necessary to restore faith, which stands on competency and credibility. Leadership and proven content of consequences of its competences are the key aspects. We consider it important to deal with the content of the relation between competency and employee performance. We consider it beneficial for corporate management to know the relations between specific sources of competency and the nature of their effect on employee performance during the acute stage of the crisis. The applied mediator model has pointed out the need for effective crisis communication based on transparency of sharing information with the employees. Furthermore, the mediator model has verified the positive effect of team organization of work, where it is possible to develop autonomy, trust and cooperation, on employee performance. The research has also verified that the diversity of crisis management does not have a fundamental effect on its competency, which affects employee performance in teams. Demographic characteristics of crisis management, such as personal or service age, gender and education, are also not important for the relation of competent crisis management and employee performance.

The aim of the research was also to point out the space for the forming of a new normal for the post-crisis period. The 4.0 Industry in its nature has prepared an environment for the companies, in which it is possible to preserve economic activity and overcome a pandemic-type crisis, which is specific to social distancing. The use of the potential of the virtual environment during the pandemic crisis is dependent on the ability of interconnecting the digital and the real world. On the corporate level, these are challenges of organizational and cultural nature. The leaders and the change management must be understood and respond adequately to these challenges (Schneider, 2018).

During the crisis caused by social distancing, fears are fulfilled and deepened. The digital age stimulates topics of scientific research of management in the direction of topics suitable also from the perspective of business practice. The penetration of the scientific research and applied examination are leadership challenges with a far-reaching impact. These are usually change management, building of competency for the digital age, development of new business models, derived consequences of the business models and qualification of employees. The acceptance of change is the subject of many scientific studies, such as change management, and it emphasizes timely communication and participation of employees (Sinčić Ćorić et al., 2020). Building competency for the digital age means the ability to acquire big data in structured or unstructured form, store it safely, process it and intelligently use it. Building the competency for the digital age means focusing on the technological, organizational and human aspect of the business (Schneider, 2018).

According to Boin et al. (2013), learning from the crisis is one of the main roles of crisis management. Since every crisis is unique, its very nature requires the capacity to improvise, discover and experiment. Therefore, it is of utmost importance for the crisis managers to have the ability to learn. Learning is the precondition for adaptation, which should subsequently help fixing dysfunctional processes and facilitate the application of newly discovered solutions. However, it also has a symbolic value for the companies – it demonstrates the ability to learn from failures.

6.2 Research limitations

The performed research has several limitations, especially in the form of other aspects of crisis management, the consideration of which would contribute to a better informative value of the results. Bigger and more quality research samples would contribute to a higher validity of research results and conclusions for the crisis management in the business practice. In the interest of covering the relevant business sectors and the size of companies in Slovakia, managers at any management level were included in the research sample, because the organizational structures of companies are different. The statements of the respondents on the crisis management competency and the relation to team performance are therefore affected by the level of management, of which

they are part. Another limitation of the interpretation of the research results is the local nature of the research and the limited research sample (122) of companies in Slovakia. From the regional perspective, the results are relevant; their generalization would require for the sample to be expanded.

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Nadežda JANKELOVÁ is the Professor of Management at the University of Economics in Bratislava. Her research is devoted to entrepreneurial decisionmaking, management in various fields of economics as well as crises management.
ORCID: 0000-0002-0045-4737

Zuzana JONIAKOVÁ is the Associate Professor of Human resources management and the leader of the Department of Management at Faculty of Business Management, University of Economics in Bratislava. She is teaching courses Rewarding, Corporate Culture and Human Resources Management. As the researcher she has been involved in many research projects in the HRM related fields.
ORCID: 0000-0002-7706-2977

Jana BLŠTÁKOVÁ is the Associate Professor of Human resoureces management and the vice-dean for international relations at Faculty of Business Management, University of Economics in Bratislava. She has been invloved in the CRANET research network as the reserach team coordinator for Slovak team. Her research focus is in people management in 4.0 Industry Era
ORCID: 0000-0002-0107-0102

Katarína PROCHÁZKOVÁ is the Assistant Professor at University of Economics in Bratislava, Faculty of Business Management: Department of Management. She is lecturer of International Management and Business course and Leadership course. Her current research activities are focused on Women in Leadership, Strategies of startups and she participate in current research task focused on crisis management during a pandemic.
ORCID: 0000-0001-7103-8338

Zuzana SKORKOVÁ is the senior researcher at Department of Management at University of Economics in Bratislava in Slovakia. She is a lecturer of Management, Organizing and Leadership. She is interested in organization theory and design, management and personal management.
ORCID: 0000-0002-4828-2188

Lasha ABULADZE is PhD student at Faculty of Business Management, University of Economics in Bratislava. He is interested in personeal management, HRM and management.
ORCID: 0000-0002-3236-0137

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