Gregurec, Iva (Ed.); Dukic, Darko (Ed.); Nedzhad, Abdelhamid (Ed.)

Conference Paper

Economic and social development : 71st International Scientific Conference on Economic and Social Development : book of proceedings : 06 August, 2021

Provided in Cooperation with:
Varazdin Development and Entrepreneurship Agency

Reference: (2021). Economic and social development : 71st International Scientific Conference on Economic and Social Development : book of proceedings : 06 August, 2021. Varazdin, Croatia : Varazdin Development and Entrepreneurship Agency. https://www.esd-conference.com/upload/book_of_proceedings/Book_of_Proceedings_esdAugust2021_Online.pdf.

Varazdin Development and Entrepreneurship Agency and **University North**
in cooperation with
Faculty of Management University of Warsaw
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat
Polytechnic of Medimurje in Cakovec

Economic and Social Development

71st International Scientific Conference on Economic and Social Development Development

Book of Proceedings

Editors:
Iva Gregurec, Darko Dukic, Abdelhamid Nedzhad

ISSN 1849-7535

06 August, 2021

Varazdin Development and Entrepreneurship Agency and **University North**
in cooperation with
Faculty of Management University of Warsaw
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat
Polytechnic of Medimurje in Cakovec

Editors:
Iva Gregurec, University of Zagreb, Croatia
Darko Dukic, Josip Juraj Strossmayer University of Osijek, Croatia
Abdelhamid Nedzhad, National School of Business and Management, Morocco

Economic and Social Development

71st International Scientific Conference on Economic and Social Development Development

Book of Proceedings

06 August, 2021

Title ■ Economic and Social Development (Book of Proceedings), 71st International Scientific Conference on Economic and Social Development Development

Editors ■ Iva Gregurec, Darko Dukic, Abdelhamid Nedzhad

Publishing Editor ■ Spomenko Kesina, Mario Vrazic, Domagoj Cingula

Publisher ■ Design ■ Print ■ Varazdin Development and Entrepreneurship Agency, Varazdin, Croatia / University North, Koprivnica, Croatia / Faculty of Management University of Warsaw, Warsaw, Poland / Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat, Morocco / Polytechnic of Medimurje in Cakovec, Cakovec, Croatia

Printing ■ Online Edition

ISSN 1849-7535
The Book is open access and double-blind peer reviewed.
Our past Books are indexed and abstracted by ProQuest, EconBIZ, CPCI (Web of Science) and EconLit databases and available for download in a PDF format from the Economic and Social Development Conference website: http://www.esd-conference.com

CONTENTS

APPLICATION OF INDUSTRY 4.0 TECHNOLOGIES IN CREATION OF AUTOMATED INDUSTRIAL COMPLEXES

Vitaliy Grachev
Siberian State Industrial University (SIBSIU),
Kemerovo region, Novokuznetsk,
Kirova str. 42, 654007, Russian Federation
vitaly.grachev@nicsu.ru

Leonid Myslyaev
LLC "Research Center of Control Systems",
Kemerovo region, Novokuznetsk,
Kirova str. 42, 654007, Russian Federation
mail@nicsu.ru

Marina Purgina
Novosibirsk State University of Economics and Management (NSUEM),
Novosibirsk region, Novosibirsk,
Kanemskaja str.56, 630099, Russian Federation
pur-11@yandex.ru

Michail Venger
Kemerovo Institute (branch) G.V. Plekhanov,
Kemerovo region, Kemerovo,
Kuznetsky str. 39, 650992, Russian Federation
venger_mk@mail.ru

ABSTRACT

The article deals with the development of automated industrial complexes using Industry 4.0 technologies. The main stages of the development of the concept of "Industry", the technology of the current stage of Industry 4.0 - technologies for the construction and use of "digital twins", BIM-technology for 3D-modeling of buildings and structures are described. The areas of application of these technologies, as well as their advantages and disadvantages are presented. An example of designing the elements of an automated process control system for the "Mine No. 12" processing plant using traditional methods and using Industry 4.0 technologies is given.

Keywords: *automated industrial complex (AIC), industrial revolution, Industry 4.0, digital twin, BIM-technologies, computer-aided design (CAD) systems, modeling, automated process control systems (APCS), EPLAN*

1. STAGES OF INDUSTRIAL REVOLUTIONS. MODERN INDUSTRY 4.0 TECHNOLOGIES

The creation of modern automated industrial complexes (AIC) is a complex task, both technically and organizationally. In conditions of limited resources, it is impossible to effectively solve the problems of creating an agro-industrial complex without the use of modern technologies, in particular, Industry 4.0 technologies. Now briefly consider the process of development and formation of the concept of the industrial revolution - "Industry" (Figure 1) [1], as well as the main technologies of the current stage of Industry 4.0 in the field of creating automated complexes.

The first industrial revolution (Industry 1.0) began in the second half of the 18th century after the appearance of steam engines, which made it possible to switch from manual labor to machine labor in almost all areas of production and caused a colossal rise in labor productivity.

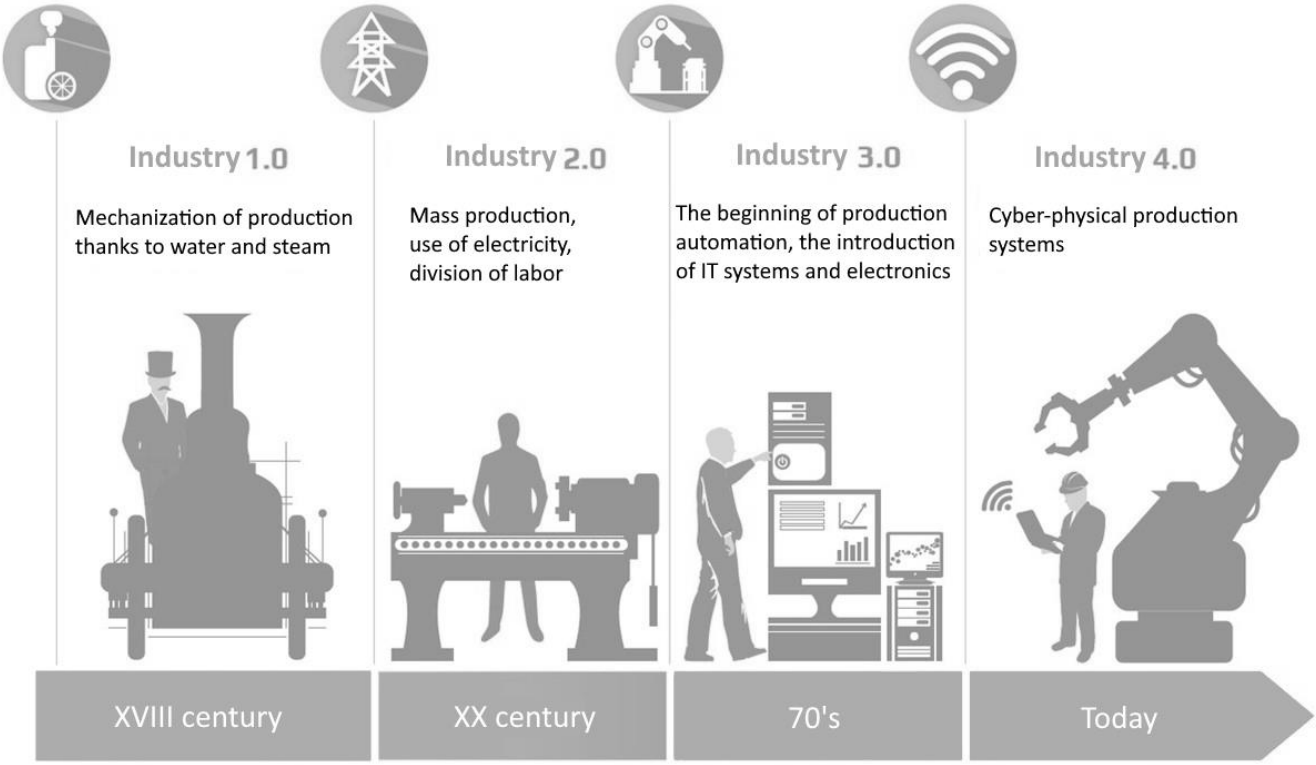


Figure 1: The process of development of the concept of "Industry" - industrial revolution

The second industrial revolution (Industry 2.0) came with the development of electricity and was characterized by the development of mass conveyor production. Its main "engine" was the development of science and the introduction of its results into production. The third industrial revolution (Industry 3.0), also called the digital revolution, began in the second half of the 20th century with the creation of digital computers and the subsequent evolution of information technology. The industrial revolution is currently entering the fourth stage (Industry 4.0), the features of which are the massive introduction of "cyber-physical systems" into production. The fourth industrial revolution began with a 2011 initiative led by academics, designers, manufacturing and policy makers who identified Industry 4.0 as a means of increasing the competitiveness of the manufacturing industry through the enhanced integration of “cyber-physical systems” into factory processes [2]. The main technologies developed in the framework of the fourth industrial revolution (Industry 4.0) are shown in Figure 2.

Figure following on the next page

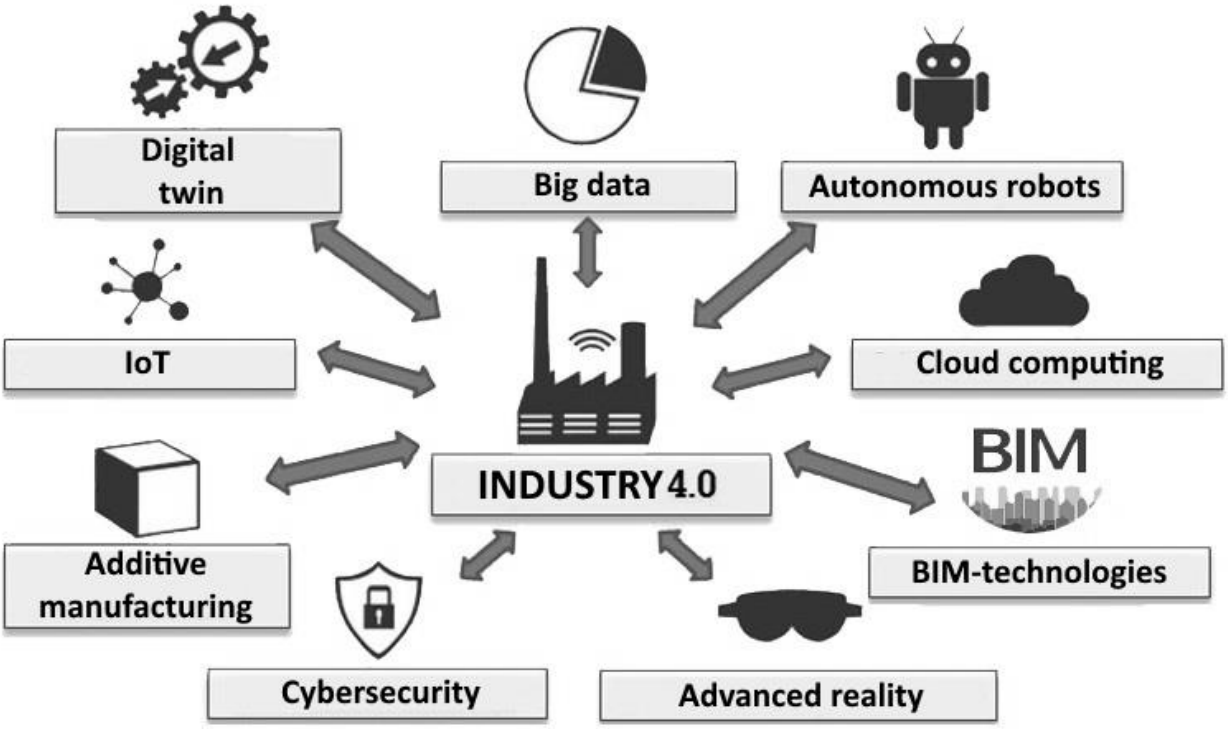


Figure 2: The main technologies of Industry 4.0

2. BUILDING INFORMATION MODELING TECHNOLOGIES

When creating automated industrial complexes, the most important and promising Industry 4.0 technologies are BIM (Building Information Model / Modeling) technologies - technologies for 3D-modeling of buildings and structures, as well as technologies for constructing and using "digital twins". "Digital Twin" in Industry 4.0 is defined as a virtual representation of a physical object, system, complex throughout their life cycle using real-time data obtained from smart sensors [3]. Within the framework of the technology of "digital twins" a digital model is created for a physical object, piece of equipment or an entire industrial complex, which is used to analyze and predict the behavior of such an object or complex as a whole. The digital model is constantly updated in order to fully comply with the current operating mode of the real complex. This makes it possible to identify unforeseen changes in the processes, to optimize the operating modes of equipment, to prevent breakdowns and accidents, which ultimately makes it possible to significantly increase the reliability and efficiency of the agro-industrial complex. However, at the moment, the scientific and practical foundations for creating digital twins of the agro-industrial complex are poorly developed [4]. For some industries, digital twins of standard objects have been developed and debugged, for example, the oil and gas industry, mechanical engineering. However, it is impossible to completely transfer a ready-made debugged system to a new object, since even seemingly insignificant differences can cause significant deviations and errors. Even for seemingly similar productions, every time a significant revision is required. The main difficulty in creating an agro-industrial complex using digital twin technologies lies in the selection and further development of such methods for creating and researching digital twins, which allow, firstly, to reasonably transfer (recalculate) the results of model solutions to a full-scale control system, and, secondly, take into account the features and conditions of its functioning most fully. In our opinion, this is possible when using the methods of natural-mathematical modeling [5-6]. BIM in the framework of Industry 4.0 is defined as an information model / modeling of buildings and structures, which in a broad sense means any infrastructure objects [7]. The first BIM-technologies began to appear in the late XX - early XXI century.

As a separate direction of computer-aided design (CAD) systems associated with 3D-modeling of buildings and structures in the form of digital three-dimensional models (digital twins of buildings and structures), BIM was formed in the second decade of the 21st century (Figure 3).

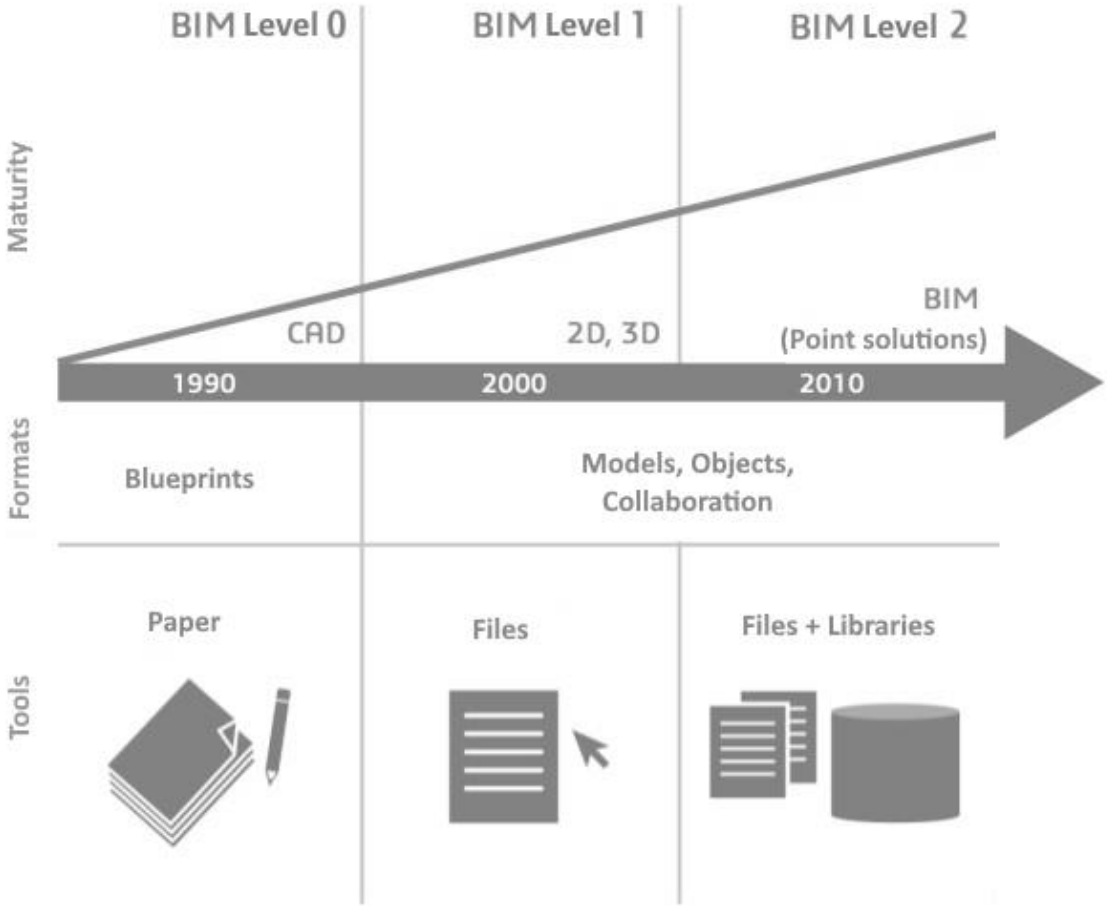


Figure 3: Evolution of BIM-technologies in the creation of automated industrial complexes

The design process is based on the creation and use of 3D-models of absolutely all elements of buildings and structures, as well as their utilities (Figure 4). Thus, BIM-technologies provide a single information platform for all participants in the creation of an automated industrial complex - designers, architects, engineers, builders, etc. BIM-technologies allow you to combine the work of many people in different directions into a single shell, allowing you to simplify and automate the design and development processes.

Figure following on the next page

Figure 4: 3D-model of a building constructed using BIM

It should be noted that BIM-technologies are not universal and comprehensive technologies for the design of automated industrial complexes in general. The areas of effective application of BIM-technologies are limited and are primarily associated with the tasks of constructing 3D-models of buildings and structures, their utilities, that is, with tasks of a spatial nature - the layout of building structures, technological equipment, utilities (water, gas, electrical, sewer, communication) etc. BIM-technologies do not solve the problems of developing software, algorithmic mathematical support for ACS TP - to solve these problems, the use of other design tools and technologies is required [8, 9]. The main advantage of using BIM technologies is the high speed of designing 3D-models, their clarity, the ability to quickly make changes at any stage of the design, the ease of organizing the joint work of many performers of one project. However, there are drawbacks when using BIM-technologies. First of all, this is the need for a transitional process to the use of BIM-technologies: it is required to restructure all participants in the creation of an automated industrial complex from traditional local design to 3D-modeling. The responsibility of specialists is growing, as well as the requirements for their knowledge and qualifications, both in the technical and informational parts [10, 11]. Also, one of the possible problems of using BIM-technologies in the design of automated industrial complexes can be a set of project documentation generated by BIM-tools and a form of document submission. The overwhelming majority of programs for building BIM-models are products of foreign production and, as a rule, are not fully adapted and localized to the design and construction standards of the Russian Federation. In 90 percent of cases, additional labor-intensive operations are required to localize project documentation to the norms and standards of a particular state. Despite all these shortcomings, the scope of application of BIM-technologies in the construction of 3D-models is quite wide, their use is economically feasible and effective. The use of digital twins of buildings and structures in the form of 3D-models built using BIM greatly simplifies the processes of their design, construction and operation.

3. BIM-SOFTWARE PRODUCTS - EPLAN ELECTRIC PACKAGE

At the moment, in the Russian design market in the field of civil engineering, there are many software products for BIM-solutions (Table 1).

Characteristic	BIM-package			
	Allplan	Revit	Renga	EPLAN
1. Development company	Nemetschek Allplan Systems GmbH (Germany)	Autodesk, Inc. (USA)	Renga Software (Russia)	EPLAN Software & Service GmbH & Co. KG (Germany)
2. Functionality	medium	high	low	high
3. Fields of application	architecture, structural elements architecture	architecture, structural elements, engineering architecture	architecture	automation, structural elements, engineering
4. Support for the Russian market	Russified software, lack of construction and documentation standards for the Russian market	partial Russification, lack of construction and documentation standards for the Russian market	full support of Russian requirements and design standards	support of Russian regulatory and technical standards GOST for working documentation
5. Compatibility of use with other software products	integration with open design systems of Russian software developers	integration with Autodesk applications	application of the created models in 1C solutions	compatibility of document formats with other CAD systems (for example, AutoCAD)

Table 1: BIM-packages presented on the Russian software market

When designing the control system cabinets of the coal-processing plant "Mine No. 12" (Kiselevsk), the EPLAN Electric BIM-package from EPLAN Software & Service GmbH & Co (Germany) was tested for the automatic generation of design documentation based on 3D-models of the components used in the data. cabinets. BIM-design made it possible to significantly, 5 times reduce the time for the development of the project of control cabinets for the automated process control system (Figure 5).

Figure following on the next page

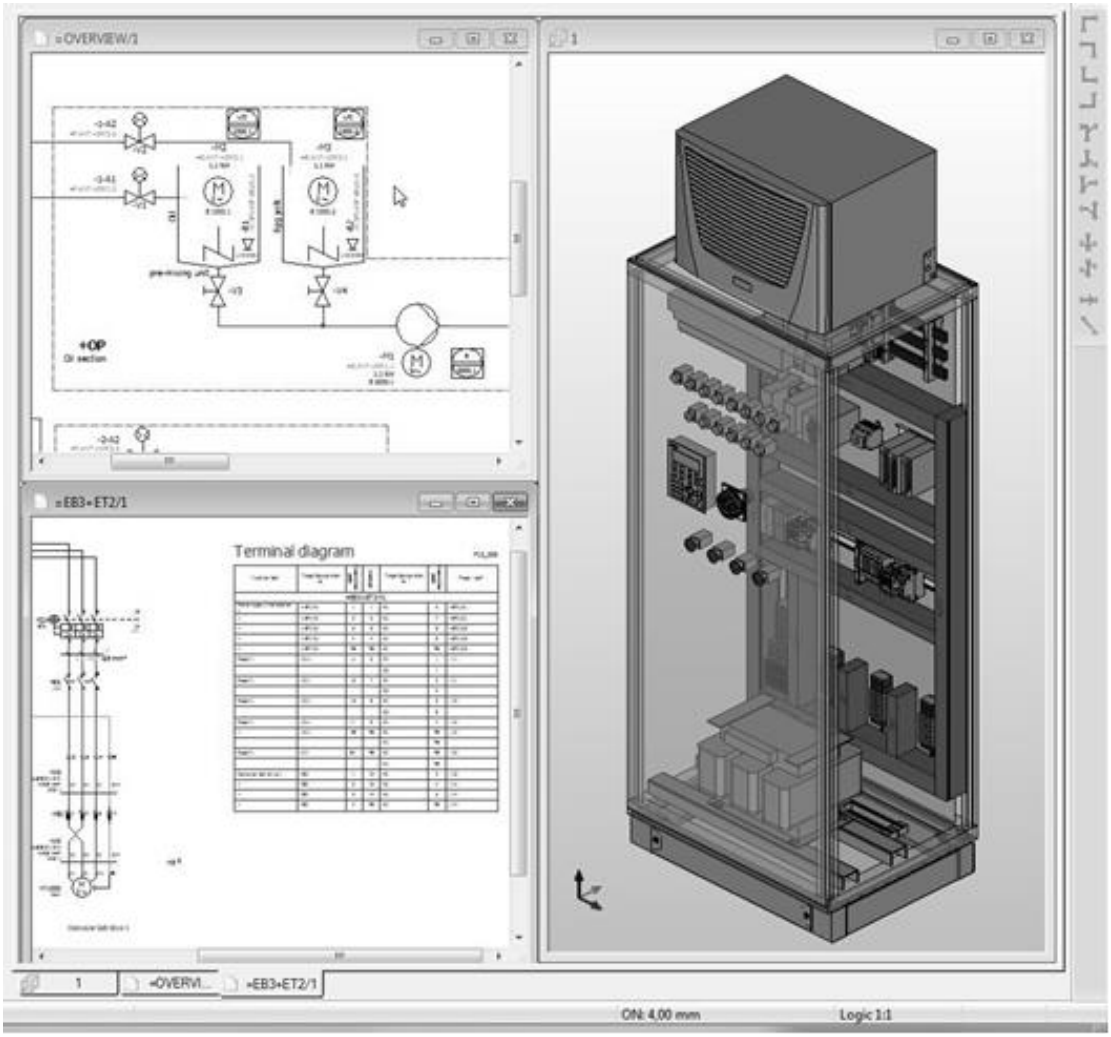


Figure 5: Control cabinet of the APCS of the Mine No. 12 PF, designed using the EPLAN Electric BIM-package

4. CONCLUSION

Technologies of the fourth industrial revolution Industry 4.0 are in many ways promising technologies for the creation of automated industrial complexes. The Industry 4.0 technologies considered in this article - technologies for building and using digital twins, BIM-technologies - are not universal tools for creating automated industrial complexes. They only in some part allow solving the problems of designing the agro-industrial complex, but they do not solve the problems of algorithmic control of complex technological processes, the problem of developing information, mathematical and software for the agro-industrial complex. However, with the development of these technologies in line with the natural-model approach, they can serve as the basis for the creation of modern automated industrial complexes.

LITERATURE:

1. Industrial Revolution // Wikipedia URL: https://ru.wikipedia.org/wiki/Promyshevnaya_revolyutsiya/ (date accessed: 01.10.2020).
2. The fourth industrial revolution // Wikipedia URL: https://ru.wikipedia.org/wiki/Four_industrial_revolution/ (date accessed: 01.10.2020).
3. Digital Twin: Prospects for using digital twins [Electronic resource]. - Access mode: https://nfp2b.ru/2019/01/09/digital-twin-perspektivy-ispolzovaniya-tsifrovyh-dvojnikov/ (date of access: 01.10.

4. Myshlyaev L. P. Digitalization and management / L.P. Myshlyaev, K.G. Wenger, V.V. Grachev // Automation systems in education, science and production. AS'2019: Proceedings of the XII All-Russian Scientific and Practical Conference (with international participation) / Ministry of Science and Higher Education of the Russian Federation, Sib. state industrial un-t [and others]; under total. ed .: S. M. Kulakova, L. P. Myshlyaeva. - Novokuznetsk: Ed. Center SibGIU, 2019 .-- S. 29-31.
5. Automation systems based on the natural-model approach: Monograph in 3 volumes. Vol.2: Automation systems for industrial purposes. Myshlyaev, A.A. Ivushkin, E.I. Lvov and others; Ed. L.P. Myshlyaeva. - Novosibirsk: Nauka, 2006 .-- 483 p.
6. Natural-mathematical modeling in control systems: Textbook. allowance / V.P. Avdeev, S.R. Zeltser, V. Ya. Kartashov, S.F. Kiselev. - Kemerovo: KemSU, 1987 .-- 84 p.
7. BIM // Wikipedia URL: https://ru.wikipedia.org/wiki/BIM (date accessed: 01.10.
8. Sazykin G.P. Design and construction of new generation coal preparation plants / G.P. Sazykin, B.A. Blue-eyed, L.P. Myshlyaev. - Novokuznetsk: SibGIU, 2003 .-- 126 p.
9. Grachev V.V. Software for control automation systems for industrial complexes / V.V. Grachev, M.V. Shipunov // Automated electric drive and industrial electronics in metallurgical and mining and fuel industries: tr. Sixth All-Russia. scientific-practical conf. - Novokuznetsk: SibGIU, 2014 .-- P. 226 - 232.
10. BIM - from project to finished building. Information modeling in the construction industry // Information portal Rengabim.com URL: https://rengabim.com/press-room/renga-v-smi/bim-ot-proekta-do-gotovogo-zdaniya-informacionnoe-modelirovanie-v- stroitelnoj-otrasli / (date accessed: 04.10.
11. Talapov V.V. BIM Basics: An Introduction to Building Information Modeling / V.V. Talapov. - M .: Publishing house: DMK-Press. - 2011 - 392 p.

CONTEMPORARY PUBLIC LEGAL CHALLENGES IN THE AREA OF E-COMMERCE

Natalia Kozlowska
Jagiellonian University in Kraków, Faculty of Law and Administration,
ul. Gołębia 24, 31-007 Cracow, Poland
natalia97.kozlowska@student.uj.edu.pl

Adam Kozien
Jagiellonian University in Kraków, Faculty of Law and Administration,
Doctoral School in the Social Sciences of the Jagiellonian University in Kraków in the discipline of Legal Sciences,
ul. Gołębia 24, 31-007 Cracow, Poland
a.kozien@doctoral.uj.edu.pl

ABSTRACT

The socio-economic development of modern societies in a globalized and digitized world contributes to the development of e-commerce as part of e-business. The transformation of running a business from traditional to electronic also requires the adaptation of appropriate legal solutions. The need for efficient legislative action is related to the dynamics of e-commerce development and its global nature. Economic activity in the field of e-commerce goes beyond national regulations, especially since it is conducted in the electronic sphere, and therefore, as a rule, has an international scope. In this situation, from the public law perspective, there is the issue of proper regulation of aspects related to competition protection, consumer law and personal data protection, so as to ensure the effectiveness of legal provisions protecting competition, consumers and personal data of entities that are parties to legal transactions in the field of e-commerce. Due to the nature of e-commerce, it is necessary to regulate both online sales and the traditional flow of goods, thanks to which it is possible to talk about the dual-track e-commerce sale. The cross-border nature of electronic sales forces consideration of contemporary public-legal challenges related to e-commerce at the international, EU and national level. The aim of the article is to analyze the current public law problems in the field of e-commerce, especially in the field of competition law, consumer law, and personal data protection law, taking into account the socio-economic aspects in the contemporary globalized world. In addition, public law challenges in the area of e-commerce will be indicated from the perspective of international, EU and national law.

Keywords: *competition law, consumer law, data protection law, e-commerce, public law*

1. INTRODUCTION

In the modern world, a particular growth and significant dissemination of e-commerce can be noticed. The development of e-commerce is related to technological progress in the Internet sphere. This led to the emergence of a new form of business. The current large increase in economic activity in the form of e-commerce is also triggered by the so-called "digital revolution" (IAB Poland, 2020), as well as the ongoing COVID-19 pandemic (Dlahandlu.pl, 2020). The numerous restrictions introduced at the international, EU, national and local level, related to the ongoing pandemic, led to the necessity to adapt the form of conducting business activity to the changing global situation. At the international level, the first documents published by the World Health Organization indicated the need for individual countries around the world to use measures to stop the spread of COVID-19 in relation to economic, social, public and economic issues (https: //www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-

pandemic). From the perspective of the European Union, specific restrictions related to the COVID-19 pandemic have been introduced, for example in the areas of public health (OJ L 213I, 16.6.2021), customs (OJ L 241, 27.7.2020), water management and fisheries (OJ L 130, 24.4. 2020), foreign trade (OJ L 85, 12.03.2021), digital single market (OJ L 114, 14.04.2020), consumers (OJ C 193, 09.06.2020), competition (OJ L 337, 14.10.2020), enterprises (COM / 2020/102 final), agriculture (OJ L 204, 26.6.2020, p. 1-3), internal market (OJ L 204, 26.6.2020, p. 4-17), transport (OJ L 158, 6.5.2021, COM (2020) 685 final) , employment and social policy (OJ L 53, 16.2.2021), to which each Member State should adapt. The solutions introduced by the EU legislator led not only to the legal, but also to the actual restriction of the implementation of the freedoms of the internal market of the European Union, specified in the Treaty on the Functioning of the European Union (OJ C 202, 7.6.2016, hereinafter TFEU), such as: art. 28-37 TFEU), services (art. 56-62 TFEU), capital (art. 63-66 TFEU), as well as persons, consisting of the freedom of establishment (art. 49-55 TFEU) (Matarewicz, 2021) and movement of employees (Articles 45-48 TFEU) (Barcz, Górka, Wyrozumska, 2015, p. 62). It is worth noting that the laws of individual countries introduced restrictions that made it difficult or even impossible to conduct business in a traditional form. The duration of the pandemic meant that it was necessary to rethink some solutions related to running a business. The market response to this situation was the popularization of the existing electronic forms of business activity. In fact, overnight, there was a transformation of trade into e-commerce, and traditionally run stores into e-shops (Koumparoulis, 2013; Madleňák, Madleňáková, 2020). The popularization of e-commerce is also in line with the preamble to the Treaty on the Functioning of the European Union, stating that: "to ensure the economic and social progress of their States by common action to eliminate the barriers which divide Europe" (OJ C 202, 7.6. 2016). In this case, the widespread use of e-commerce has led to the breaking of the economic barriers created by the pandemic. The transformation from a traditional business to an e-commerce business also requires appropriate legal regulations at the international, EU and national level. Particular attention should be paid to the international dimension, especially that in the case of e-commerce, national borders are blurred. From the legal perspective, this issue is not only of a private-law nature and of the relationship between a business entity and the consumer, but also of a public-law nature, especially in the sphere of competition protection, consumer and personal data protection, and generally freedom of economic activity. E-commerce significantly influences the globalization of more and more areas of social, political and economic life. From an economic and managerial perspective, as well as a legal one, an important element is the correct selection of an appropriate business model (Osterwalder, Pigneur, 2010; Kowalczuk, Kosch, Mucha, 2017; Kardas, 2016), which is also innovative and creative today (Tomczyk, 2014), which is appropriate to the nature of the economic activity in question and ensures undistorted competition as well as protection of consumer interests. The aim of the article is to analyze the current public law problems in the field of e-commerce, especially in the field of competition law, consumer law, and personal data protection law, taking into account the socio-economic aspects in the contemporary globalized world. In addition, public law challenges in the area of e-commerce will be indicated from the perspective of international, EU and national law.

2. MEANING OF E-COMMERCE FROM THE LEGAL, ECONOMICAL AND MANAGERIAL PERSPECTIVE

In the literature on the subject, for example, the following definition of e-commerce can be indicated: "The term e-commerce comes from the English language, and its full name is electronic commerce. Literally translated, it means electronic commerce" (Gotfryd, Całczyńska, 2021, own translation). The rapid increase in the importance of online sales resulted in the clarification of certain models in the field of e-commerce, i.e. B2B, B2C, C2C

and C2B (Moriset, 2018). It should also be noted that e-commerce is dualistic in nature. In this context, the moment of purchase itself, via online platforms, as well as the traditional relocation of previously purchased goods will be relevant. Accordingly, two stages of e-commerce transactions can be distinguished: the first is the conclusion of a civil law contract, i.e. a purchase and sale contract, although not in a traditional written form, because in this case we are dealing with a contract, but concluded via a new channel, which is the Internet (Wiktorczyk, 2015). The second stage, however, is the actual transfer of goods to the consumer or entrepreneur - in this respect, regulations in the field of transport and customs regulations will gain importance. Therefore, e-commerce is not detached from the so-called cross-border areas (Trybka, 2015), i.e. cooperation between states, in particular in the field of the movement of goods. First of all, online sales are characterized by the fact that it covers a wide audience, which translates into its global nature. The duality of e-commerce makes the purely formal process of concluding a contract easier, but running an e-commerce business does not mean that administrative barriers between countries automatically disappear. There are many components to the existence and functioning of e-commerce. First of all, the development of e-commerce would not be possible without electronic banking and various forms of electronic payment available (Czech, 2020). Also, the purchase-sale transaction itself would not have taken place if it were not for the physical release of the goods, which is why another important aspect in this area is the logistics department, i.e. managing the delivery, storage and transport of goods. In particular, the above will be important in transactions between entities from different countries, so it is important to adopt an appropriate business model that would meet certain basic requirements in the field of e-commerce. E-commerce must also not be deprived of control, and in particular the monitoring of product movements. In this context, states should clarify the issues related to administrative procedures that will not lead to distortion of competition and will not be an excessive formality on the part of entities participating in various types of transactions. Performing certain administrative and legal actions is often associated with exceeding the threshold of the value of the goods being transferred. This solution has been adopted in the field of e-commerce, but only within the European Union, through the EU Council Directive 2017/2455 of 5 December 2017 (OJ L 348, 29.12.2017) and the EU Council Directive 2019/1995 of 21 November 2019 (OJ L 310, 2.12.2019) This means that the trade in goods in excess of the legally determined amount will be associated with specific obligations on the part of consumers or entrepreneurs. The pace of e-commerce development means that the states, and in particular the member states of the European Union, make certain regulations so that the law meets the needs and changing trends in the field of running a business, in fact all over the world. However, a problematic issue may be the globalization of online sales (Chodak, 2010), which makes it difficult to regulate e-commerce issues in a larger area than, for example, economic unions. Legal systematization of regulations in the field of e-commerce would also have a positive impact on economic issues, because the pace at which sales through online platforms develops brings significant income and it is becoming increasingly necessary to regulate issues related to the distribution and consumption of various types of goods. E-commerce is correlated with foreign trade, and thus it will gradually be possible to observe an increase in the importance of macroeconomics or the science of international economic relations (Budnikowski, Kawecka-Wyrzykowska, 2006). There is no doubt that the huge benefit of e-commerce is the development of international trade, because buying and selling transactions using the Internet increases the availability of various types of goods. Innovation in running a business in the field of e-commerce is not only a number of benefits and facilitations, because its proper functioning is associated with a number of obligations.

First of all, like any business, it should be conducted on the basis of a certain economic and business model, which is of particular importance from the perspective of the nature of e-commerce, because it should meet the general criteria related to electronization and digitization, while ensuring basic consumer rights.

3. ECONOMIC FREEDOM AND ECONOMIC ACTIVITY REGARDING TO E-COMMERCE

Economic activity in the area of e-commerce is part of the implementation of freedom or freedom of economic activity. This could be seen especially in the context of the COVID-19 pandemic, when the freedom to conduct a business was radically restricted due to health protection. At that time, one of the few possibilities of relatively free business activity was the one conducted as e-commerce. It can therefore be concluded that the very creation and development of e-commerce significantly affects the implementation of economic freedom. Economic freedom is not absolute and there are possibilities to limit this freedom, however, they must take place within the scope and procedure defined at the constitutional and legislative levels. In the legal doctrine, economic freedom derives from liberal concepts and treats it as: "the freedom of the citizen to freely operate in the economic market" (Banasiński, 2015a, p. 64, own translation). Economic freedom as an idea is at the basis of economic, legal and philosophical considerations (Szafrański, 2018), while treating it as an "instrument of economic development" (Banasiński, 2015a, p. 66, own translation) can be seen in classical economic thought, i.e. in the works of e.g. A. Smith and JS Milla (Banasiński, 2015a, p. 66). In the liberal approach, economic freedom "should be understood as a certain bundle of rights (property, choice of profession, freedom of work, etc.) that allow a person to individually fulfill their needs and develop their own personality" (Banasiński, 2015a, p. 66, own translation), while economic activity can be equated as "activity characterizing an entrepreneur" (Gronkiewicz-Waltz, Jaroszyński, 2015, p. 232, own translation) and "means undertaking a set of activities that are related to the participation of an individual in economic turnover" (Gronkiewicz-Waltz, Jaroszyński, 2015, p. 232, own translation). From a legal perspective, for example, according to the Polish Act of 6 March 2018 - Entrepreneurs' Law, economic activity is "organized gainful activity, performed on one's own behalf and on a continuous basis" (article 3, Dz.U. – Journal of Laws 2021, item 162, own translation). In law, economic freedom is both a rule of law and a public subjective law (Szafrański, 2018, p. 71). Consideration of economic freedom, even from a legal perspective, cannot be closed in the law itself, because this concept, being closely related to philosophy and economics, has strong dynamics related to the economic life of states and societies (Szafrański, 2018, p. 72). It is also worth noting that in legal doctrine it is noted that economic freedom has its foundations outside of positive law (Szafrański, 2018, p. 72; Zaradkiewicz, 2016, p. 547) and belongs to natural law (Szafrański, 2018, p. 72; Kieres, 2013, p. 92), and therefore a holistic approach to economic freedom, even in legal terms, requires interdisciplinarity. It should also be emphasized that nowadays economic freedom is part of the concept of sustainable development (Kozien, Kozien, 2018; Kozien, Kozien, 2019). E-commerce has an international dimension, so it is worth noting that economic freedom is also ensured at the level of international law. Pursuant to art. 22 Universal Declaration of Human Rights "Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic , social and cultural rights indispensable for his dignity and the free development of his personality" (https://www.un.org/sites/un2.un.org/files/udhr.pdf). At the level of European Union law, it is worth pointing out that, apart from the freedoms of the internal market of the European Union, specified in the Treaty on the Functioning of the European Union (OJ C 202, 7.6.2016), the freedom to conduct a business is protected under Art. 16 Charter of Fundamental Rights of the

European Union in the words: "The freedom to conduct a business in accordance with Union law and national laws and practices is recognized" (OJ C 326, 26.10.2012). It should be stated that e-commerce fits perfectly into economic freedom, as well as running a business, and allows for even more effective implementation of this freedom, also in times of crisis.

4. PUBLIC LEGAL ASPECTS OF E-COMMERCE

Prima facie, it seems that the issue of e-commerce from the legal perspective relates in principle to private law, and more specifically to contractual relations, however, a wide range of possibilities for e-commerce activities beyond escaping national regulations and the need to look at this subject from the legal point of view It also means that certain aspects of running a business in the field of e-commerce should be considered in the public law. The most characteristic public law aspects of e-commerce include competition law, consumer protection law and personal data protection law. Competition protection is one of the key elements of freedom of economic activity. Legal doctrine states that "Competition in the market is associated with the freedom of competing entrepreneurs who have free property" (Banasiński, 2015b, p. 316, own translation). Lack of competition between entrepreneurs leads to the creation of a monopoly and a denial of economic freedom. In order to prevent practices restricting competition by business entities, first of all, appropriate regulations at the level of international, EU and national law are necessary, but also specific actions of competent administrative authorities that will counteract the practices of entrepreneurs restricting competition or unfair practices (Banasiński, 2015b, p. 316). The relevant regulations in the field of competition protection are contained in national legal orders, however, it is worth pointing out that the EU legislator attaches great importance to competition protection, which in art. 101 TFEU states that: "The following shall be prohibited as incompatible with the internal market: all agreements between the board, decisions by associations of and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market" (OJ C 202, 7.6.2016) followed by an open directory of prohibited activities. Moreover, the EU legislator in art. 102 TFEU states that: "Any abuse by one or more of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States" (OJ C 202, 7.6.2016), and then also the EU legislator indicates an open catalog of prohibited activities of entrepreneurs. Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty (Text with EEA relevance) (OJ L 001 4.1.2003, p. 1 as amended) and Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of between (the EC Merger Regulation) (Text with EEA relevance) (OJ L 024, 29.01.2004). Also in the area of e-commerce, it is necessary to counteract practices that restrict competition, and may be both prohibited collective practices - e.g. agreements between entrepreneurs, as well as individual - by abusing "a dominant position by one or more entrepreneurs (individual practices)" Banasiński, 2015b, p. 323, own translation). On the one hand, it seems that activity in the Internet sphere allows for stronger competition between various entities conducting business activity, however, at the same time, the possibility of anti-competitive activities using unlawful behavior on the Internet (e.g. hacker attacks) leads to the conclusion that the e-commerce area is also vulnerable to unfair market practices and anti-competitive activities. In addition, a separate issue, albeit of lesser importance in the area of e-commerce, is state aid from the state, which may significantly distort competition. The need to protect consumers results from appropriate regulations both at the level of individual countries and those of an international nature. Consumer protection was indicated by the EU legislator in art. 169 paragraph 1 TFEU, which states that: "In order to promote the interests of consumers and to ensure a high level of consumer protection, the Union shall contribute to protecting the health,

safety and economic interests of consumers, as well as to promoting their right to information, education and to organize themselves in order to safeguard their interests" (OJ C 202, 7.6.2016). The European Union may also, in accordance with art. 169 paragraph 2 and 3 TFEU, adopt specific measures to protect consumers, but regardless of this on the basis of art. 169 paragraph 4 TFEU "Measures adopted pursuant to paragraph 3 shall not prevent any Member State from maintaining or introducing more stringent protective measures. Such measures must be compatible with the Treaties. The Commission shall be notified of them" (OJ C 202, 7.6.2016). The doctrinal definition of consumers "refers to people who use the material effects of entrepreneurs and includes people in a specific legal relationship aimed at obtaining a specific benefit, as well as potential buyers of these benefits" (Banasiński, 2015c, p. 373, own translation) . A consumer in a legal relationship with an entrepreneur is rightly treated as the weaker party to the legal relationship, if only due to the assumption that he does not have the professional and specialist knowledge that the entrepreneur has in the field of business activity. In the area of e-commerce, consumer protection is of particular importance, because the consumer, when concluding a standard sale and purchase contract, cannot check what product is sent to him, therefore, in some legal orders, there is a possibility of withdrawing from a distance contract outside the entrepreneur's seat within a specified period of time. . In the area of e-commerce, the consumer choosing a product via the Internet also does not have the possibility to check various features of a given product and to a large extent the consumer-entrepreneur relationship is based on trust that, firstly, the description of a given product corresponds to reality, and legal and physical defects and will be delivered in a timely manner. For this reason, it is necessary to have appropriate regulations protecting the rights of consumers in the field of e-commerce at the international, EU and national level, especially as the problematic issue may be differences in the scope of regulations regarding e-commerce in the legal orders of individual countries. An important element of the legal order strengthening consumer protection is also the functioning of the relevant administrative bodies dealing with consumer protection, as well as the existence of appropriate proceedings in the case of practices harmful to the interests of individual and collective consumers. In the area of e-commerce, the issue of personal data protection is of particular importance. In the modern world, personal data is a commodity with a specific value. By operating in the Internet sphere, users are constantly forced to enter a variety of personal data. The necessity to extend the protection of personal data on the legal level resulted from computerization (Barta, Fajgielski, Markiewicz, 2011, p. 26). In legal terms, personal data is protected under international law, both at the level of the United Nations and the Council of Europe legislation. At the European Union level, apart from art. 8 Charter of Fundamental Rights of the European Union (OJ C 326, 26.10.2012), a significant strengthening of the protection of personal data was the introduction of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46 / EC (General Data Protection Regulation) (Text with EEA relevance) (OJ L 119, 4.5.2016), which as comprehensive as possible regulated the issue of personal data protection in the territory of the European Union. It is also worth noting from the e-commerce perspective that this regulation, in accordance with Art. 3 sec. 1 "applies to the processing of personal data in the context of the activities of an establishment of a controller or a processor in the Union, regardless of whether the processing takes place in the Union or not" (OJ L 119, 4.5.2016) and, in addition, in accordance with art. 3 sec. 2 of the Regulation "applies to the processing of personal data of data subjects who are in the Union by a controller or processor not established in the Union, where the processing activities are related to:

a) the offering of goods or services, irrespective of whether a payment of the data subject is required, to such data subjects in the Union; or

b) the monitoring of their behavior as far as their behavior takes place within the Union" (OJ L 119, 4.5.2016).

As a result, it can be concluded that the EU legislator wanted to prevent the circumvention of European Union law by global entities that have their headquarters outside the European Union, but also conduct business activity there. It should also be emphasized that also individual countries have national regulations aimed at the protection of personal data. In the area of e-commerce, the collection and processing of data via the Internet is carried out on a massive scale, and large enterprises operating in the field of e-commerce process and collect numerous data that can be classified as Big Data (Schermann, Krcmar, Hemsen, Markl, Buchmüller, Bitter, Hoeren, 2014; Klein, Tran-Gia, and Hartmann, 2013; Marx, 2013). Activities in the area of e-commerce may pose a significant threat to the protection of consumers' personal data. A problematic issue is often the amount of data that the consumer has to provide to purchase a product, and the fact that this data may be transferred to other entities, while entrepreneurs may also learn about consumer preferences from other online platforms, e.g. social media. Moreover, in order for the consumer to be able to conclude contracts in the area of e-commerce, he must consent to the collection and processing of personal data in the form that will be indicated by the entrepreneur. In general, the problem of cross-border data collection and processing in the area of e-commerce and the fact that the consumer is the weaker party to the obligation relationship with the entrepreneur, which also with regard to the collection and processing of personal data, despite numerous legal regulations, may impose *sui generis* own rules of the game.

5. CONTEMPORARY CHALLENGES OF E-COMMERCE FROM THE PESPECTIVE OF PUBLIC LAW

Technological and IT development contributes to the facilitation of everyday life, but at the same time becomes a challenge for the legislation of modern countries. This time, however, in terms of online sales, we are not only talking about issues that affect individual countries separately. E-commerce is a global topic of a universal nature. This is due to the specific nature of transactions carried out on the Internet. At the outset, the question arises whether it is possible in any way to regulate the issues related to the purchase and sale transaction that takes place in the virtual world. The specificity of the e-commerce industry and the current situation in the world mean that in today's information society a new model of making various types of electronic transactions is becoming more and more popular (https://www.forbes.com/sites/jiawertz/2020/08/01/3-emerging-e-commerce-growth-trends-to-leverage-in-2020/?Sh=7c0422606fee). As it was pointed out at the beginning, running and using this type of activity is possible thanks to the rapid development of digitization in the world. Therefore, the noticeable transformation of the conducted business activities causes a number of legal and economic problems. Traditional sales between entities from different countries have been regulated in many legal acts, including in the United Nations Convention on Contracts for the International Sale of Goods, drawn up in Vienna on 11 April 1980 (Dz.U. – Journal of Laws of 1997, No. 45, item 286). Online sales, on the other hand, is a completely different form and requires new regulations in this area. In fact, e-commerce is closely related to international trade, because it is mainly to facilitate sales between entities outside a given country, or even outside the European Union. Internet sales are also recognized nationally, but it is trade outside the country that raises legal problems. At various times in history, people wondered where, individual countries have their borders. In the 21st century, it is possible to return to this topic, albeit from a different perspective, i.e. cyberspace management (Worona, 2017). In this context, the question arises how to recognize and systematize sales between entities from different countries, using sales platforms.

It seems that it is necessary to find mechanisms that will allow for the standardization of regulations concerning online sales to some extent. The online sales model is also associated with administrative issues, i.e. creating internal solutions in the field of legal and tax services for electronic transactions. At this point, it is also worth considering whether it is possible to adjust regulations on a universal level, which were not only a bilateral legal agreement, but global principles guiding e-commerce. A consequence of the global nature of e-commerce is also ensuring equal opportunities for all entities participating in transactions via the Internet. Considering that e-commerce mainly facilitates trade between entities from outside the European Union, it should mainly focus on the issue of ensuring equal opportunities for entities that are not members of the Community, while not discriminating against members of the European Union. From a different perspective, it can be said that, in fact, thanks to one network, which is the Internet, a global, *de facto* one market was created, and all entities operating in it should have equal rights and opportunities. It would not be possible to talk about e-commerce if it were not for the dynamic development of electronic platforms. In this respect, one may wonder whether we are dealing with a completely new economic entity operating on the international arena at the moment. Regulating the provisions on electronic platforms (Targański, 2006) is connected with some kind of legal fiction, although having such a status could significantly facilitate online sales. There is no doubt that the creation of an entity which would be an electronic platform should be a regulation at the supranational level, and if such a solution is not possible, it would be necessary to find out how other countries, which do not distinguish such an economic entity, should recognize it in their transactions. The issues of e-commerce are not only legal issues, but also issues related to economics and management (Szymański, 2013). Running a business in the form of e-commerce cannot take place without appropriate management of technological systems that allow consumers and entrepreneurs to make purchase and sale transactions using the Internet. Internet sales are often associated with the fact that transactions are made faster than using traditional methods. Thus, proper management of platforms and online stores should constitute the basis for conducting business in this form. Proper management of websites, which are the de facto basic tool in e-commerce, should also ensure the return of goods, which is one of the many consumer rights. A completely different issue in the field of e-commerce development and its global character is the problem of the slow disappearance of cultural differences between nations. The 21st century is often referred to as the beginning of the information society century (Krztoń, 2015, p. 103-108) The availability of goods on various types of online platforms not only causes excessive consumerism, but also in the longer term leads to the standardization of certain behaviors and the unification and similarity of various nations in many respects. It can be concluded that e-commerce is part of the ongoing globalization process.

6. CONCLUSIONS

In the area of e-commerce there are numerous challenges not only of an economic, social and technological nature, but also legal. Legal challenges in the field of e-commerce concern not only private law but also public law issues, among which the protection of competition, consumers and personal data can be distinguished in a special way. E-commerce is a new form of business, the creation and development of which is related to technological progress and the gradual digitization of subsequent areas of political, social and economic life. Economic activity in the area of e-commerce requires the use of an appropriate business model, flexible management and the provision of appropriate technological facilities, without which it would not be possible to effectively conduct e-commerce business. In addition to these aspects, it is necessary to properly adjust legal regulations to conduct business in the area of e-commerce. Due to the global nature of e-commerce, it is necessary to have appropriate legal regulations not only at the national level, but especially at the EU and international level.

Regardless of the need for legal regulations at the EU and international level, cooperation between individual countries in the control of global economic activity in the area of e-commerce is necessary. From the public-law perspective, the aspects that require appropriate legal regulations and inter-state cooperation in this area include the protection of competition, consumers and personal data. Technological development contributed to the emergence of e-commerce, although its development was particularly influenced by the COVID-19 pandemic, during which, in principle, the only possible form of doing business was in the area of e-commerce. It also follows that in order to ensure the full realization of economic freedom nowadays, it is necessary to operate e-commerce as a form of running a business. In addition, e-commerce is part of the globalization tendencies in many areas of political, social and economic life and is the result of the development of the so-called information society.

LITERATURE:

1. Act of 6 March 2018 – Entrepreneurs' Law, Dz.U. – Journal of Laws 2021, item 162.
2. Banasiński, C. (2015a). *Konstytucyjne podstawy ustroju gospodarczego*. [in:] Gronkiewicz-Waltz, H., Wierzbowski, M. (Eds.). *Prawo gospodarcze. Zagadnienia administracyjnoprawne*. Warszawa: Wolters Kluwer.
3. Banasiński, C. (2015b). *Publicznoprawne aspekty ochrony konkurencji (prawo antymonopolowe i prawo pomocy publicznej*. [in:] Gronkiewicz-Waltz, H., Wierzbowski, M. (Eds.). *Prawo gospodarcze. Zagadnienia administracyjnoprawne*. Warszawa: Wolters Kluwer.
4. Banasiński, C. (2015c). *Publicznoprawne problemy ochrony konsumentów*. [in:] Gronkiewicz-Waltz, H., Wierzbowski, M. (Eds.). *Prawo gospodarcze. Zagadnienia administracyjnoprawne*. Warszawa: Wolters Kluwer.
5. Barcz, J., Górka, M., Wyrozumska, A. (2015). *Instytucje i prawo Unii Europejskiej. Podręcznik dla kierunków prawa, zarządzania i administracji*. Warszawa: Wolters Kluwer.
6. Barta, J., Fajgielski, P., Markiewicz, R. (2011). *Ochrona danych osobowych. Komentarz*. 5. wydanie, Warszawa: Wolters Kluwer.
7. Budnikowski, A., Kawecka-Wyrzykowska, E. (2006). *Międzynarodowe stosunki gospodarcze*. Warszawa: Polskie Wydawnictwo Ekonomiczne.
8. Charter of Fundamental Rights of the European Union, OJ C 326, 26.10.2012.
9. Chodak, G. (2010). *E-commerce narzędziem globalizacji handlu*. „Przegląd Organizacji", nr 6, pp. 40– 43.
10. Commission Decision (EU) 2020/1101 of 23 July 2020 amending Decision (EU) 2020/491 on relief from import duties and VAT exemption on importation granted for goods needed to combat the effects of the COVID-19 outbreak during 2020 (notified under document number C(2020) 4936), OJ L 241, 27.7.2020.
11. Commission Implementing Regulation (EU) 2021/442 of 11 March 2021 making the exportation of certain products subject to the production of an export authorization, OJ L 85, 12.3.2021.
12. Commission Implementing Regulation (EU) 2021/734 of 5 May 2021 amending Implementing Regulation (EU) 2021/521 making specific arrangements to the mechanism making certain products subject to the production of an export authorization, OJ L 158, 6.5.2021.
13. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, COM/2020/102 final.
14. Communication from the Commission to the European Parliament, the European Council and the Council upgrading the transport Green Lanes to keep the economy going during the COVID-19 pandemic resurgence, COM(2020) 685 final.

15. Council conclusions on media literacy in an ever-changing world, OJ C 193, 9.6.2020.
16. Council Directive (EU) 2017/2455 of 5 December 2017 amending Directive 2006/112/EC and Directive 2009/132/EC as regards certain value added tax obligations for supplies of services and distance sales of goods, OJ L 348, 29.12.2017.
17. Council Directive (EU) 2019/1995 of 21 November 2019 amending Directive 2006/112/EC as regards provisions relating to distance sales of goods and certain domestic supplies of goods, OJ L 310, 2.12.2019.
18. Council Recommendation (EU) 2021/961 of 14 June 2021 amending Recommendation (EU) 2020/1475 on a coordinated approach to the restriction of free movement in response to the COVID-19 pandemic (Text with EEA relevance), OJ L 213I, 16.6.2021.
19. Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation) (Text with EEA relevance), OJ L 024, 29.01.2004.
20. Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty (Text with EEA relevance), OJ L 001 4.1.2003, p. 1 as amended.
21. Czech, T. (2020). Prawa konsumenta. Komentarz. Warszawa: Wolters Kluwer, art. 18.
22. Dlahandlu.pl (2020). *Shoper: Ruch w e-sklepach jak w Black Friday.* https://www.dlahandlu.pl/e-commerce/wiadomosci/shoper-ruch-w-e-sklepach-jak-w-black-friday,87456.html, [access: 15.07.2021].
23. Gotfryd, K., Całczyńska, E. (2021). *Opodatkowanie handlu e-commerce*. [in:] Łuczak, S. (Ed.). *Podatki w branży FMCG i e-commerce*. Warszawa: Wolters Kluwer.
24. Gronkiewicz-Waltz, H., Jaroszyński, K. (2015). *Przedsiębiorca*. [in:] Gronkiewicz-Waltz, H., Wierzbowski, M. (Eds.). *Prawo gospodarcze. Zagadnienia administracyjnoprawne*. Warszawa: Wolters Kluwer.
25. https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic, [access: 15.07.2021].
26. https://www.forbes.com/sites/jiawertz/2020/08/01/3-emerging-e-commerce-growth-trends-to-leverage-in-2020/?sh=7c0422606fee, [access: 15.07.2021].
27. IAB Polska. (2020). *Rewolucja 4.0 – jak pandemia COVID-19 zmieni rynek pracy?*. https://www.iab.org.pl/aktualnosci/rewolucja-4-0-jak-pandemia-covid-19-zmieni-rynek-pracy/, [access: 15.07.2021].
28. Kardas, M. (2016). *Pojęcia i typy modeli biznesu*. [in:] Klincewicz, K. (Ed.). *Zarządzanie, organizacje i organizowanie – przegląd pespektyw teoretycznych*, Warszawa: Wydawnictwo Naukowe Wydziału Zarządzania Uniwersytetu Warszawskiego.
29. Kieres, L. (2013). [in:] Hauser, R., Niewiadomski, Z., Wróbel, A. (Eds.). *System Prawa Administracyjnego, t. 8A. Publiczne prawo gospodarcze*. Warszawa: C.H. Beck.
30. Klein, D., Tran-Gia, P., Hartmann, M. (2013). *Big Data*. „Informatik Spektrum", Vol. 36.
31. Konwencja Narodów Zjednoczonych o umowach międzynarodowej sprzedaży towarów, sporządzona w Wiedniu dnia 11 kwietnia 1980 r., Dz.U. 1997 nr 45 poz. 286.
32. Koumparoulis, D.N. (2013). *PEST Analysis: The case of E-shop*. "International Journal of Economy, Management and Social Sciences", 2(2), pp. 31-36.
33. Kowalczuk, M., Kosch, O., Mucha, D. (2017). *Modele biznesu w teorii zarządzania*. „Security, Economy & Law", no. 2/2017.

34. Kozien, E., Kozien, A. (2018). *The sustainability development concept under the regulations in force of the Treaty on European Union and the Treaty on the Functioning of the European Union – legal and economical view*. [in:] Ribeiro, H., Naletina, D., da Silva, A.L. (Eds.). *Economic and Social Development (Book of Proceedings), 35th International Scientific Conference on Economic and Social Development – „Sustainability from an Economic and Social Perspective"*. Varazdin: Varazdin Development and Entrepreneurship Agency.
35. Kozień, E., Kozień, A. (2019). *Efficiency of the Principle of Sustainable Development in the European Union Law*. [in:] Ulewicz R., Hadzima B. (Eds.), *Quality Production Improvement - QPI 2019*, Warszawa: Walter de Gruyter (Sciendo).
36. Krztoń, W. (2015). *XXI wiek – wiekiem społeczeństwa informacyjnego*. "Modern, Management, Review", Quarterly, Volume XX (July - September), Research Journal 22 (3/2015).
37. Madleňák, R., Madleňáková, L. (2020). *Multi-Criteria Evaluation of E-Shop Methods of Delivery From the Customer's Perspective*. "Transport Problems", vol. 15, issue 1, doi: 10.21307/tp-2020-001.
38. Marx, V. (2013). *The big challenges of big data*. „Nature", Vol. 498.
39. Moriset, B. (2018). *e-Business and e-Commerce*. halshs-01764594, https://halshs.archives-ouvertes.fr/halshs-01764594/document, [access: 15.07.2021].
40. Osterwalder, A., Pigneur, Y. (2010). *Tworzenie modeli biznesowych. Podręcznik wizjonera*. One Press Exclusive, Gliwice: Wydawnictwo Helion.
41. Recommendations Commission Recommendation (EU) 2020/518 of 8 April 2020 on a common Union toolbox for the use of technology and data to combat and exit from the COVID- 19 crisis, in particular concerning mobile applications and the use of anonymised mobility data, OJ L 114, 14.4.2020.
42. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance), OJ L 119, 4.5.2016.
43. Regulation (EU) 2020/560 of the european parliament and of the council of 23 April 2020 amending Regulations (EU) No 508/2014 and (EU) No 1379/2013 as regards specific measures to mitigate the impact of the COVID-19 outbreak in the fishery and aquaculture sector, OJ L 130, 24.4.2020.
44. Regulation (EU) 2020/872 of the European Parliament and of the Council of 24 June 2020 amending Regulation (EU) No 1305/2013 as regards a specific measure to provide exceptional temporary support under the European Agricultural Fund for Rural Development (EAFRD) in response to the COVID-19 outbreak, OJ L 204, 26.6.2020, p. 1-3.
45. Regulation (EU) 2020/873 of the European Parliament and of the Council of 24 June 2020 amending Regulations (EU) No 575/2013 and (EU) 2019/876 as regards certain adjustments in response to the COVID-19 pandemic, OJ L 204, 26.6.2020, p. 4-17.
46. Regulation (EU) 2021/177 of the European Parliament and of the Council of 10 February 2021 amending Regulation (EU) No 223/2014 as regards the introduction of specific measures for addressing the crisis associated with the outbreak of COVID-19, OJ L 53, 16.2.2021.
47. Regulations Commission Regulation (EU) 2020/1474 of 13 October 2020 amending Regulation (EU) No 360/2012 as regards the prolongation of its period of application and a time-bound derogation for undertakings in difficulty to take into account the impact of the COVID-19 pandemic, OJ L 337, 14.10.2020.

48. Schermann, M., Krcmar, H., Hemsen, H., Markl, V., Buchmüller, Ch., Bitter, T., Hoeren, T. (2014). *Big Data - An Interdisciplinary Opportunity for Information Systems Research*. „Business & Information Systems Engineering", Vol. 6, Iss. 5.
49. Szafrański, A. (2018). *Konstytucyjna wolność gospodarcza na tle historii idei i gospodarki*. Warszawa: C.H. Beck.
50. Szymański, G. (2013). *Innowacje marketingowe w sektorze e-commerce*. Łódź: Wydawnictwo Politechniki Łódzkiej.
51. Targański, B. (2006). *Platformy handlu elektronicznego z perspektywy prawa antymonopolowego Wspólnoty Europejskiej*. „International Journal of Management and Economics", no. 20.
52. Tomczyk, M. (2014). *Determinanty wyboru kreatywnego modelu biznesowego*. "Zeszyty Naukowe Uniwersytetu Szczecińskiego" Ekonomiczne problemy usług nr 110, no. 796.
53. Treaty on the Functioning of the European Union (Consolidated version 2016), OJ C 202, 7.6.2016.
54. Trybka, W. (2015). *Europejska współpraca administracyjna w przepisach prawa administracyjnego procesowego*. [in:] Jagielski, J., Wierzbowski, M. (Eds.). *Prawo administracyjne dziś i jutro*. Warszawa: Wolters Kluwer.
55. Universal Declaration of Human Rights proclaimed by the United Nations General Assembly in Paris on 10 December 1948, https://www.un.org/sites/un2.un.org/files/udhr.pdf, [access: 15.07.2021].
56. Wiktorczyk, M. (2005). *Zawieranie umów przez sieć Internet*. „CBKE e-Biuletyn", Centrum Badań Problemów Prawnych i Ekonomicznych Komunikacji Elektronicznej, Wydział Prawa, Administracji i Ekonomii, Uniwersytet Wrocławski, Wrocław; https://www.bibliotekacyfrowa.pl/Content/23683/PDF/Zawieranie_umow_przez_siec_Internet.pdf, [access: 15.07.2021].
57. Worona, J. (2017). *Cyberprzestrzeń a Prawo Międzynarodowe Status Quo i Perspektywy*. Uniwersytet w Białymstoku, Białystok, doctoral thesis, https://repozytorium.uwb.edu.pl/jspui/bitstream/11320/5875/1/J_Worona_%20Cyberprzestrzen_a_%20prawo_miedzynarodowe_Status_quo_i_perspektywy.pdf, [access: 15.07.2021].
58. Zaradkiewicz K. (2016). [in:] Safjan, M., Bosek, L. (Eds.). *Konstytucja RP, t. 1*. Warszawa: C.H. Beck.

FACTOR INFLUENCING CONSUMER INTENTION TO CONTINUE USE OF MOBILE SHOPPING APPS DURING COVID-19 PANDEMIC

Samar Rahi
Hailey College of Banking & Finance, University of the Punjab, Lahore, Pakistan
sr_adroit@yahoo.com

Mehwish Ishtiaq
Hailey College of Banking & Finance, University of the Punjab, Lahore, Pakistan

ABSTRACT

Despite various studies indicate a tremendous development for m-shopping during the COVID-19 pandemic, several service providers are unaware about the factors which influence consumer intentions to continuing use m-shopping apps during the pandemic. The purpose of this research work is to examine the factor influencing consumer intention to continue use of mobile shopping apps during COVID-19 pandemic. Literature review revealed that ECM, brand-awareness facets, and task-technology fit (TTF) have been positively associated to the SAT except USF and PBA. The SAT and TTF would be positively associated to the INT to use m-shopping apps during COVID-19 pandemic. The research combines the ECM, brand awareness components, and task-technology fit (TTF) with the self-efficacy factor to get insights into customers' continuing intents to use m-shopping apps during the COVID-19 pandemic. Businesses should offer online commodities to increase organizational viability in the face of the COVID-19 pandemic, particularly in developing nations like Pakistan. In terms of theoretical development, we developed an innovative framework that combines components from three prominent theories: expectation confirmation theory, online knowledge, and task-technology fit (TTF) with self-efficacy factor. The study differentiates from multiple other studies that explored earlier adoption of m-shopping apps during the COVID-19 pandemic since it includes a huge assessment of consumer behavior in terms of future aspirations.

Keywords: *Perceived usefulness, expectation-confirmation model, perceived ease of use, brand-awareness facets, Task Technology Fit (TTF), continuance intentions, consumer behavior, user satisfaction, self-efficacy*

1. INTRODUCTION

The introduction of all traditional and online shopping venues has made it easier for people to buy. The electronics industry is active and diverse (Bhattacherjee., 2001a). According to Bourlakis, Papagiannidis, and Fox (2008), m-shopping apps are gained prominence as a convenient means of making purchases. This is a frequent strategy for purchasing in the digital age. M-shopping becomes more popular than ever, whether for clothing, electronics, or livestock. Throughout the year, new browsers and applications are developed to meet the growing demand for instant shopping (Rahi, Abd.Ghani, & Hafaz Ngah, 2019). According to Bhattacherjeee and Lin' (2015a), 'IS continuity' refers to a conscientious and aspirational conduct that motivates users to use an IS for an extended period of time. Despite the fact that m-commerce apps are already incredibly popular, the reasons affecting their continued growth will help equally economic specialists and e-commerce practitioners (S. Rahi, 2018; S. Rahi & M. Ghani, 2018; Rahi, Ghani, & Ngah, 2020). The study intends to examine an integrating framework that comprises three core theories, “expectation-confirmation theory (ECT), online knowledge, and task-technology fit model with self-efficacy factor,” as well as evaluate customers' continuous intentions for the usage of m-shopping applications during COVID-19 pandemic. What has an impact of TTF on USF and SAT? How to analyse the impact of brand-awareness elements in the continuous use of m-shopping applications.

What effect does SEF have between SAT and INT. Researchers have been studying continual intentions in the field of digital marketing. Many online shops are actively seeking m-shopping applications. Customers who have access to digital platforms and cellphones may get any forms of consumer items. According to Wagner (2011) If businesses comprehend the consumers' portable multichannel behavior, smartphones do have the capacity to modify the buying expertise. Similarly, in 2019 new COVID-2019 burst as a dangerous world-wide outbreak toward the start of December and spread throughout China before reaching the entire globe in Feb 2020. "According to the World Health Organization (WHO), there were 184,105,272 globally confirmed cases of COVID-19 infections and 3,988,565 deaths up through July 7, 2021" (WHO, 2021). Throughout the COVID-19 outbreak, the WHO strongly advised using a masks in publicly, social distances self-isolation, as well as various self-protection activities to prevent explicit and implicit interaction between humans and minimize the chance of COVID-19 spread (Rahi, Khan, & Alghizzawi, 2021; Wilder-Smith & Freedman, 2020). Because of the increasing prominence of mobile shopping apps, experts and administrators of e-commerce organizations would've been interested in determining the factors that influence their sustained usage, however it would be necessary to investigate how to satisfy customers with the continuous usage m-shopping applications during COVID-19 pandemic. A thorough literature review revealed that previous research on expectation confirmation theory (ECT), online knowledge, and task-technology fit with self-efficacy factor was conducted, but can't elaborate on all of the notions as determinants which might impact SAT for continuous usages of m-shopping applications. The importance of continued use surpasses the importance of first use (Rahi, Othman Mansour Majeed, Alghizzawi, & Alnaser Feras, 2019; Rahi, Othman Mansour, Alharafsheh, & Alghizzawi, 2021). Although brand awareness facets and TTF have various distinct characteristics that potentially influence customer behavior throughout the ongoing use of m-shopping (Rahi, Ghani, & Alnaser, 2017; R. Samar, Norjaya, & Feras, 2017). The theoretical background becomes an important aspect of a journal articles because a complete investigation could not be carried out and similarly rational outcomes could not be produced without it. First of all, the expectation-confirmation model (ECM), which was extensively studied in prior study although not in the manner as this research study will examine. This topic was already investigated in wristwatches (Nascimentoo, Oliveira;, & Tam., 2018; Rahi & Abd. Ghani, 2019b), e-learning (Lee, 2010b), electronic banking (Rahi & Abd. Ghani, 2019a; Rahi & Ghani, 2019; R. Samar & Mazuri, 2019), and digitalization (Hong', Thong;, & Tamm, 2006). This research model could provide a more comprehensive understanding of customers' long-term goals. Secondly, another concept that had not properly investigated in previous research would be online knowledge services. (Dağhan & Akkoyunlu, 2016; M.-H. Hsu, Chang, Chu, & Lee, 2014; W.-T. Wang, Wang, & Liu, 2016; Y.-S. Wang, Tseng, Wang, Shih, & Chan, 2019). This study provides a diverse picture of the influence of information system factors on SAT by studying the three elements of brand-awareness (Rahi, 2016a; Rahi & Abd. Ghani, 2019c; S. Rahi & M. A. Ghani, 2016). Therefore, this paper would then contribute to the existing amount of understanding (Rahi, 2016b; Rahi & Abd. Ghani, 2018; Rahi & Abd.Ghani, 2019; S. Rahi & M. A. Ghani, 2018b; Rahi, Ishtiaq, Farooq, & Alnaser, 2021). Thirdly, TTF has been the most studied element in the analysis, but it has not been studied in the way in which this paper will discuss . The influence of TTF on the continuing utilization of m-shopping applications during COVID-19 pandemic are investigated in this research. And that's how this study will provide to the literature, paving the way for future study in this field.

2. LITERATURE REVIEW

2.1. Expectation-Confirmation Model (ECM)

The expectation confirmation model (ECM) has been widely used to investigate individual purchase behavior especially using information technology Hong' et al. (2006); Hsiao, Chang,

and Tang (2016a); Wen, Prybutok, and Xu (2011), communication via mobile or digital devices online schooling for consumers by Joo, Park, and Shin (2017a); Oghumaa, Libaquee-Saenz, Wongg, and Changg (2016a); (S. Rahi & M. A. Ghani, 2018a) web browsing's signaling affects by Pee, Jiang, and Klein (2018a), and technological innovation in wrist watch by Nascimentoo et al. (2018). ECM is studied the behavior of users rigorously following the purchase of sustainable development, expectations and satisfaction in marketing sector (Dabholkar, Shepherd, & Thorpe, 2000). According to Sarkar and Khare (2019) ECMs must be utilized in contemporary market research for study of linkages between confirmation, satisfaction and user intention to adopt digital shopping applications. According to Bhattacherjee' (2001c), User Satisfaction is defined as the customer's effects on the previous usage, which encompasses the successful continuance element. ECM essentially indicates that consumers of information technology have been happy by their earlier usage of specific products and services (Baker'-Eveleth & Stone., 2015a; Bhattacherjee', 2001c; Fleischmann, Amirpur, Grupp, Benlian, & Hess, 2016a; Halilovic & Cicic, 2013b). Despite employing it as a INT predictor, Zhouu (2011a) expressed customer satisfaction (SAT) with cellular networking. According to Kim and Son (2009), customer satisfaction (SAT) influences web users' continuous intentions (INT). Users that have been pleased with mobile shopping are encouraged to continue using them and to spread nice word.

2.2. Expectation-Confirmation (CON)

According to Bhattacherjee' (2001c), since the earliest usage of IT implicitly imposed on customer expectations, CON had been a behavioural assumptions. TAM and related studies (Davis, Bagozzi, & Warshaw, 1989; Kwon, Park, & Kim, 2014; Rahi, Ghani, & Ngah, 2018; van der Heijden, 2004), was shown that external characteristics and behavioral ideas might even assist consumers recognize their acceptability frames, physiologic and operational aspects. Throughout this research, CON has been defined as obtaining predicted advantages or benefits from m-shopping applications, whereas inconsistencies may indicate an inability to match the customer's fundamental expectations. Whenever the previous expectations (CON) are met, the adoption of m-commerce applications will increase consumer USF, EOU, and SAT. As a result, it may be hypothesized as follows:

- **H1:** Expectation-confirmation (CON) is positively related to perceived usefulness (USF) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.
- **H2:** Expectation-confirmation (CON) is positively related to perceived ease of use (EOU) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.
- **H3:** Expectation-confirmation (CON) is positively related to user satisfaction (SAT) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.

2.3. Perceived Usefulness (USF)

According to Bhattacherjee' (2001c), perceived Usefulness (USF) is a quantifiable platform for people to boost productivity by adopting IT. It covers the theoretical aspect of IT continuity including the use of selections. The USF has been recognized as a crucial element to SAT and INT in all IT industry segments. (Park, 2013; Rahi, Ammara, & Qazi, 2021; W. Wang, Ngai, & Wei, 2012). According to (Bhattacherjee., 2001a; Rahi, Ghani, Alnaser, & Ngah, 2018), post-purchase criteria are sometimes fair because they've been formed by current or previous IT experience. (Fleischmann et al., 2016a; Halilovic & Cicic, 2013b; C.-L. Hsu & Lin, 2015; Rahi & Ahmad, 2020; Zhouu & Lu, 2011a). Research studies reveal a significant relationship between USF and SAT, suggesting customers' attitudes on higher rationality in m-shopping applications (Alnaser, Ghani, & Rahi, 2019; S. Rahi & M. Ghani, 2016; Rahi & Ishaq, 2020). Users being more valuable if their expectations, profitability, and expenditures will be met.

As a result, the following hypothesis is proposed:

- **H4:** Perceived usefulness (USF) is positively related to user satisfaction (SAT) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.

2.4. Perceived Ease of Use (EOU)

In terms of m-shopping applications, the latest research defines "perceived ease of use (EOU)" as "the degree where almost every user believes that the enormous amount of effort isn't required in order to use or manage mobile shopping applications" (Davis', 1989a; Daviss, Bagozzii, & Warshaww, 1989b; S. Samar, Ghani, & Alnaser, 2017). According to (Davis', 1989a; Lesemann, Woletz, & Koerber, 2007a; Moon & Kim, 2001a), EOU is becoming an important part of technology and INT adoption, as well as a consistent practice of behavior. EOU had widely used in previous research to demonstrate the use of behavior and the implementation of IS. According to Ashfaq, Yun, Waheed, Khan, and Farrukh (2019), if there was no simple accessibility to a reliable communicating channel (such as applications or websites), it appears that these mediums had a detrimental impact on their customers. As a result, the following hypothesis is proposed:

- **H5:** Perceived ease of use (EOU) is positively related to user satisfaction (SAT) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.

2.5. Perceived Ease of Use (EOU) and Perceived Usefulness (USF)

According to Lee (2010b), the TAM framework's major features are stated as "perceived ease of use (EOU) and perceived usefulness (USF)." USF denotes whether an individual possesses by employing a unique method and boosting his working performance and EOU denotes a person's belief in the ease with which a given method can be applied (system) (Daviss et al., 1989b; Samar Rahi, 2018). Previous research has suggested that EOU has a favorable influence on USF in m-shopping (Alnaser et al., 2018; Joo, So, & Kim, 2018; Kumar, Purani, & Viswanathan, 2018; Shang & Wu, 2017). The research shows that EOU and USF have a strong relationship when it comes to m-shopping applications. As a result, the following hypothesis have been formed:

- **H6:** Perceived ease of use (EOU) is positively related to perceived usefulness (USF) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.

2.6. Continuance Intention (INT)

According to Lii and Fang (2019), the level of user satisfaction (SAT) with IT influenced INT. Several ECM studies are available in try to better understand INT. For example Zheng, Zhao, and Stylianou (2013), demonstrate that INT consumers in the digital world have influenced by SAT in order to utilize and participate to online societies. According to Ramkissoon and Mavondo (2015), tourist happiness is tied to the aim to be environmentally sustainable. SAT had an apparent and concealed influence on approved INT users (Rahi, 2015; Wen, Prybutok, & Xu, 2011a). An past analysis revealed that the SAT does have a substantial impact on INT (Hsiao et al., 2016a; Oghumaa et al., 2016a). As a result, the following hypothesis have been formed:

- **H7:** User satisfaction (SAT) is positively related to continuance intentions (INT) of consumer intention to continue use of m-shopping apps during COVID-19 pandemic.

3. DISCUSSION AND CONCLUSION

The framework combines the ECM, brand awareness facets and TTF models and the self-efficacy factor was proposed in the study to examine variables that intend to maintain the continued usage of m-shopping apps during COVID-19 pandemic. The results suggest that CON has a strong relationship with USF (Rahi, Alnaser, & Ghani, 2019).

This is also similar with earlier research that have studied expectation-confirmation influence on the purchase of apps, smartphones and cellular instant messaging (Lii & Fang, 2019; Oghumaa et al., 2016a; Sarkar & Khare, 2019). Lii and Fang (2019) research work shows that smartphone brand applications' expectations of their USF are favorably associated. Sarkar and Khare (2019) shows that the USF has a beneficial effect on CON in the ongoing use of mobile shopping. The study combines the ECM, brand awareness components, and TTF model with self-efficacy to acquire insights into customers' continuing intentions to use m-shopping apps during COVID-19 pandemic. Businesses should offer online commodities to increase organizational sustainability during COVID-19 pandemic, particularly in developing countries like Pakistan. Businesses should define suitable customer criteria enhance marketing strategies, and strive to meet customers' demands and needs in order to increase user satisfactions with continual utilisation m-shopping apps during COVID-19 pandemic. The three-faceted brand awareness is a differentiating feature in the continuing use of m-shopping apps during COVID-19 pandemic. As a result, in order to keep users known, businesses should focus on brand awareness development on business channels and on providers aspects. Mobile shopping apps must be made more interesting by offering regular use contests, such as referring tickets for wins. Authorities should convince customers that purchasing digital things is a simple, safe, and efficient process. The applications should be simple to use and accessible so that customers' opinions are positively and constructively influenced throughout the m-shopping experiences during COVID-19 pandemic. Because the virus's propagation are expected to persist for a longer period, it's necessary to maintain social distance by minimizing outdoor purchasing. This requires consistent use of m-shopping apps during COVID-19 pandemic. During COVID-19 pandemic, ECT, brand awareness facets, TTF, and self-efficacy for m-shopping apps could lead to a positive assessment of quality services. In regarding the theoretical development, we have built a theoretical framework that integrates aspects from three prominent theories, the theory of expectation confirmation, online knowledge and task-technology fit with self-efficacy. When compared to previous studies that assessed customers' continuous intents to use m-shopping applications, this study had a greater explanatory power of 90.1 percent than Du et al. (2020), which had just 55.2 percent. The study differs from multiple other studies that explored early uptake of m-shopping apps (Ashfaq et al., 2019; Sarkar & Khare, 2019), in that It entails a large-scale assessment of customer behavior in terms of continued intents. Additionally, the data revealed that satisfaction is the most powerful effective motivator and is the highest importance values in IPMA. Hence, the proposed framework makes a substantial contribution to the developing marketing area, specially in regards of continued usage of m-shopping apps during COVID-19 pandemic.

LITERATURE:

1. Alnaser, F. M., Ghani, M. A., & Rahi, S. (2019). The Implementation of Partial Least Square Modelling (PLS) For Marketing Research in Arab Countries: Introduction to Beginner Users-Evidence from Islamic Banks of Palestine. *Economic and Social Development: Book of Proceedings*, 1134-1141.
2. Alnaser, F. M., Ghani, M. A., Rahi, S., Mansour, M., Abed, H., & Alharbi, A. H. (2018). *Extending the Role of Servqual Model in Islamic Banks with Subjective Norms, Customer Satisfaction and Customer Loyalty.* Paper presented at the Economic and Social Development (Book of Proceedings), 32nd International Scientific Conference on Economic and Social.
3. Ashfaq, M., Yun, J., Waheed, A., Khan, M. S., & Farrukh, M. (2019). Customers' expectation, satisfaction, and repurchase intention of used products online: Empirical evidence from China. *SAGE Open, 9*(2), 2158244019846212.

4. Baker'-Eveleth, L., & Stone., R. W. (2015a). Usability, expectation, confirmation, and continuance intentions to use electronic textbooks. *Behaviour & Information Technology, 34*(10), 992-1004. doi: 10.1080/0144929X.2015.1039061
5. Bhattacherjee', A. (2001c). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly, 25*(3), 351-370. doi: 10.2307/3250921
6. Bhattacherjee., A. (2001a). Understanding information systems continuance: An expectation-confirmation model. *MIS quarterly*, 351-370.
7. Bhattacherjeee, A., & Lin', C.-P. (2015a). A unified model of IT continuance: three complementary perspectives and crossover effects. *European Journal of Information Systems, 24*(4), 364-373. doi: 10.1057/ejis.2013.36
8. Bourlakis, M., Papagiannidis, S., & Fox, H. (2008). E-consumer behaviour: Past, present and future trajectories of an evolving retail revolution. *International Journal of E-Business Research (IJEBR), 4*(3), 64-76.
9. Dabholkar, P. A., Shepherd, C. D., & Thorpe, D. I. (2000). A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study. *Journal of retailing, 76*(2), 139-173.
10. Dağhan, G., & Akkoyunlu, B. (2016). Modeling the continuance usage intention of online learning environments. *Computers in Human Behavior, 60*, 198-211.
11. Davis', F. D. (1989a). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319-340. doi: 10.2307/249008
12. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science, 35*(8), 982-1003.
13. Daviss, F. D., Bagozzii, R. P., & Warshaww, P. R. (1989b). User acceptance of computer technology: a comparison of two theoretical models. *Management science, 35*(8), 982-1003.
14. Fleischmann, M., Amirpur, M., Grupp, T., Benlian, A., & Hess, T. (2016a). The role of software updates in information systems continuance — An experimental study from a user perspective. *Decision Support Systems, 83*, 83-96. doi: https://doi.org/10.1016/j.dss.2015.12.010
15. Halilovic, S., & Cicic, M. (2013b). Understanding determinants of information systems users' behaviour: a comparison of two models in the context of integrated accounting and budgeting software. *Behaviour & Information Technology, 32*(12), 1280-1291. doi: 10.1080/0144929X.2012.708784
16. Hong', S., Thong;, J. Y., & Tamm, K. Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision support systems, 42*(3), 1819-1834.
17. Hsiao, C.-H., Chang, J.-J., & Tang, K.-Y. (2016a). Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives. *Telematics and Informatics, 33*(2), 342-355.
18. Hsu, C.-L., & Lin, J. C.-C. (2015). What drives purchase intention for paid mobile apps? – An expectation confirmation model with perceived value. *Electronic Commerce Research and Applications, 14*(1), 46-57. doi: https://doi.org/10.1016/j.elerap.2014.11.003
19. Hsu, M.-H., Chang, C.-M., Chu, K.-K., & Lee, Y.-J. (2014). Determinants of repurchase intention in online group-buying: The perspectives of DeLone & McLean IS success model and trust. *Computers in Human Behavior, 36*, 234-245.
20. Joo, Y. J., Park, S., & Shin, E. K. (2017a). Students' expectation, satisfaction, and continuance intention to use digital textbooks. *Computers in Human Behavior, 69*, 83-90.

21. Joo, Y. J., So, H.-J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. *Computers & Education, 122*, 260-272.
22. Kim, S. S., & Son, J.-Y. (2009). Out of Dedication or Constraint? A Dual Model of Post-Adoption Phenomena and Its Empirical Test in the Context of Online Services. *MIS Quarterly, 33*(1), 49-70. doi: 10.2307/20650278
23. Kumar, D. S., Purani, K., & Viswanathan, S. A. (2018). Influences of 'appscape'on mobile app adoption and m-loyalty. *Journal of Retailing and Consumer Services, 45*, 132-141.
24. Kwon, S. J., Park, E., & Kim, K. J. (2014). What drives successful social networking services? A comparative analysis of user acceptance of Facebook and Twitter. *The Social Science Journal, 51*(4), 534-544. doi: https://doi.org/10.1016/j.soscij.2014.04.005
25. Lee, M.-C. (2010b). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model. *Computers & Education, 54*(2), 506-516.
26. Lesemann, E., Woletz, N., & Koerber, S. (2007a). *Combining methods to evaluate mobile usability*. Paper presented at the Proceedings of the 9th international conference on Human computer interaction with mobile devices and services.
27. Lii, C.-Y., & Fang, Y.-H. (2019). Predicting continuance intention toward mobile branded apps through satisfaction and attachment. *Telematics and Informatics, 43*, 101248.
28. Moon, J.-W., & Kim, Y.-G. (2001a). Extending the TAM for a World-Wide-Web context. *Information & management, 38*(4), 217-230.
29. Nascimentoo, B., Oliveira;, T., & Tam., C. (2018). Wearable technology: What explains continuance intention in smartwatches? *Journal of Retailing and Consumer Services, 43*, 157-169.
30. Oghumaa, A. P., Libaquee-Saenz, C. F., Wongg, S. F., & Changg, Y. (2016a). An expectation-confirmation model of continuance intention to use mobile instant messaging. *Telematics and Informatics, 33*(1), 34-47.
31. Park, E. (2013). The adoption of tele-presence systems. *Kybernetes*.
32. Pee, L. G., Jiang, J., & Klein, G. (2018a). Signaling effect of website usability on repurchase intention. *International Journal of Information Management, 39*, 228-241.
33. Rahi, S. (2015). Moderating role of brand image with relation to internet banking and customer loyalty: a case of branchless banking. *The Journal of Internet Banking and Commerce, 20*(3).
34. Rahi, S. (2016a). Impact of Customer Perceived Value and Customers Perception of Public Relation on Customer Loyalty with Moderating Role of Brand Image. *The Journal of Internet Banking and Commerce, 21*(2), ---.
35. Rahi, S. (2016b). Impact of Customer Value, Public Relations Perception and Brand Image on Customer Loyalty in Services Sector of Pakistan. *Arabian J Bus Manag Review S2*, 004.
36. Rahi, S. (2018). Examining the Effects of Travel Constraints, Tourist Satisfaction and Website Image on Tourist Loyalty in Developing Countries Context. *Economic and Social Development: Book of Proceedings*, 478-487.
37. Rahi, S. (2018). *Technology Adoption Issues in Banks*: CreateSpace Independent Publishing Platform.
38. Rahi, S., & Abd. Ghani, M. (2018). The role of UTAUT, DOI, perceived technology security and game elements in internet banking adoption. *World Journal of Science, Technology and Sustainable Development, 15*(4), 338-356. doi: doi:10.1108/WJSTSD-05-2018-0040
39. Rahi, S., & Abd. Ghani, M. (2019a). Does gamified elements influence on user's intention to adopt and intention to recommend internet banking? *International Journal of Information and Learning Technology, 36*(1), 2-20. doi: doi:10.1108/IJILT-05-2018-0045

40. Rahi, S., & Abd. Ghani, M. (2019b). Integration of expectation confirmation theory and self-determination theory in internet banking continuance intention. *Journal of Science and Technology Policy Management, 10*(3), 533-550. doi: 10.1108/jstpm-06-2018-0057
41. Rahi, S., & Abd. Ghani, M. (2019c). Investigating the role of UTAUT and e-service quality in internet banking adoption setting. *The TQM Journal, 31*(3), 491-506.
42. Rahi, S., & Abd.Ghani, M. (2019). Integration of DeLone and McLean and self-determination theory in internet banking continuance intention context. *International Journal of Accounting & Information Management, 27*(3), 512-528. doi: 10.1108/ijaim-07-2018-0077
43. Rahi, S., Abd.Ghani, M., & Hafaz Ngah, A. (2019). Integration of unified theory of acceptance and use of technology in internet banking adoption setting: Evidence from Pakistan. *Technology in Society, 58*, 101120. doi: https://doi.org/10.1016/j.techsoc.2019.03.003
44. Rahi, S., & Ahmad, S. (2020). *Investigating the role of employee readiness to change on effective organizational change implementation: a theoretical perspective.* Paper presented at the Economic and Social Development (Book of Proceedings), 52nd International Scientific Conference on Economic and Social Development.
45. Rahi, S., Alnaser, F. M., & Ghani, M. A. (2019). Designing Survey Research: Recommendation for Questionnaire Development, Calculating Sample Size and Selecting Research Paradigms. *Economic and Social Development: Book of Proceedings*, 1157-1169.
46. Rahi, S., Ammara, U. E., & Qazi, T. F. (2021). THE IMPACT OF ADVERTISEMENT ON CUSTOMER LOYALTY WITH MEDIATING ROLE OF WORD OF MOUTH (WOM). *Economic and Social Development: Book of Proceedings*, 224-229.
47. Rahi, S., & Ghani, M. (2016). Internet Banking, Customer Perceived Value and Loyalty: The Role of Switching Costs. *J Account Mark, 5*(4), 188. doi: 10.4172/2168-9601.1000188
48. Rahi, S., & Ghani, M. (2018). *E-Banking Challenges and Opportunities: An Empirical Investigation on Branchless*: CreateSpace Independent Publishing Platform.
49. Rahi, S., Ghani, M., Alnaser, F., & Ngah, A. (2018). Investigating the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context. *Management Science Letters, 8*(3), 173-186.
50. Rahi, S., Ghani, M., & Ngah, A. (2018). A structural equation model for evaluating user's intention to adopt internet banking and intention to recommend technology. *Accounting, 4*(4), 139-152.
51. Rahi, S., & Ghani, M. A. (2016). Customer's Perception of Public Relation in E-Commerce and its Impact on E-Loyalty with Brand Image and Switching Cost. *Journal of Internet Banking and Commerce, 21*(3).
52. Rahi, S., & Ghani, M. A. (2018a). *Investigating the Role of E-Service Quality and Brand Image in Internet Banking Acceptance Context with Structural Equation Modeling (SEM-PLS).* Paper presented at the Economic and Social Development (Book of Proceedings), 30th International Scientific Conference on Economic and Social.
53. Rahi, S., & Ghani, M. A. (2018b). *A Structural Equation Modeling (SEM-AMOS) for Investigating Brand Loyalty and Customer's Intention towards Adoption of Internet Banking* Paper presented at the Economic and Social Development (Book of Proceedings), 29th International Scientific Conference on Economic and Social.
54. Rahi, S., & Ghani, M. A. (2019). Integration of expectation confirmation theory and self-determination theory in internet banking continuance intention. *Journal of Science and Technology Policy Management*.
55. Rahi, S., Ghani, M. A., & Alnaser, F. M. (2017). The Influence of E-Customer Services and Perceived Value on Brand Loyalty of Banks and Internet Banking Adoption: A Structural Equation Model (SEM). *The Journal of Internet Banking and Commerce, 22*(1), 1-18.

56. Rahi, S., Ghani, M. A., & Ngah, A. H. (2020). Factors propelling the adoption of internet banking: the role of e-customer service, website design, brand image and customer satisfaction. *International Journal of Business Information Systems, 33*(4), 549-569. doi: 10.1504/ijbis.2020.105870
57. Rahi, S., & Ishaq, M. (2020). *Factors Influencing online Shopping behavior With Mediating Role of Customer Perceived Value.* Paper presented at the Economic and Social Development: Book of Proceedings.
58. Rahi, S., Ishtiaq, M., Farooq, W., & Alnaser, F. (2021). *EXAMINING FACTORS INFLUENCE INDIVIDUAL BEHAVIOUR TO CONTINUE USE OF MOBILE SHOPPING APPS WITH THE INTEGRATION OF TECHNOLOGY ACCEPTANCE MODEL AND BRAND AWARENESS.* Paper presented at the Economic and Social Development (Book of Proceedings), 7th ITEM Conference-" Innovation, Technology, Education and.
59. Rahi, S., Khan, M. M., & Alghizzawi, M. (2021). Factors influencing the adoption of telemedicine health services during COVID-19 pandemic crisis: an integrative research model. *Enterprise Information Systems, 15*(6), 769-793. doi: 10.1080/17517575.2020.1850872
60. Rahi, S., Othman Mansour Majeed, M., Alghizzawi, M., & Alnaser Feras, M. (2019). Integration of UTAUT model in internet banking adoption context: The mediating role of performance expectancy and effort expectancy. *Journal of Research in Interactive Marketing, 13*(3), 411-435. doi: 10.1108/jrim-02-2018-0032
61. Rahi, S., Othman Mansour, M. M., Alharafsheh, M., & Alghizzawi, M. (2021). The post-adoption behavior of internet banking users through the eyes of self-determination theory and expectation confirmation model. *Journal of Enterprise Information Management, ahead-of-print*(ahead-of-print). doi: 10.1108/jeim-04-2020-0156
62. Ramkissoon, H., & Mavondo, F. T. (2015). The satisfaction–place attachment relationship: Potential mediators and moderators. *Journal of Business Research, 68*(12), 2593-2602. doi: https://doi.org/10.1016/j.jbusres.2015.05.002
63. Samar, R., & Mazuri, A. G. (2019). Does gamified elements influence on user's intention to adopt internet banking with integration of UTAUT and general self-confidence? *International Journal of Business Excellence, 19*(3), 394-414.
64. Samar, R., Norjaya, M. Y., & Feras, M. A. (2017). Measuring the role of website design, assurance, customer service and brand image towards customer loyalty and intention to adopt interent banking. *The Journal of Internet Banking and Commerce, 22*(S8).
65. Samar, S., Ghani, M., & Alnaser, F. (2017). Predicting customer's intentions to use internet banking: the role of technology acceptance model (TAM) in e-banking. *Management Science Letters, 7*(11), 513-524.
66. Sarkar, S., & Khare, A. (2019). Influence of expectation confirmation, network externalities, and flow on use of mobile shopping apps. *International Journal of Human–Computer Interaction, 35*(16), 1449-1460.
67. Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*.
68. van der Heijden, H. (2004). User Acceptance of Hedonic Information Systems. *MIS Quarterly, 28*(4), 695-704. doi: 10.2307/25148660
69. Wagner, J. (2011). ANYTIME/ANYWHERE--PLAYING CATCH UP WITH THE MIND OF THE SMARTPHONE CONSUMER. *International Journal of Mobile Marketing, 6*(1).
70. Wang, W.-T., Wang, Y.-S., & Liu, E.-R. (2016). The stickiness intention of group-buying websites: The integration of the commitment–trust theory and e-commerce success model. *Information & Management, 53*(5), 625-642. doi: https://doi.org/10.1016/j.im.2016.01.006

71. Wang, W., Ngai, E. W. T., & Wei, H. (2012). Explaining Instant Messaging Continuance Intention: The Role of Personality. *International Journal of Human–Computer Interaction, 28*(8), 500-510. doi: 10.1080/10447318.2011.622971
72. Wang, Y.-S., Tseng, T. H., Wang, W.-T., Shih, Y.-W., & Chan, P.-Y. (2019). Developing and validating a mobile catering app success model. *International Journal of Hospitality Management, 77*, 19-30.
73. Wen, C., Prybutok, V. R., & Xu, C. (2011). An integrated model for customer online repurchase intention. *Journal of Computer Information Systems, 52*(1), 14-23.
74. Wen, C., Prybutok, V. R., & Xu, C. (2011a). An integrated model for customer online repurchase intention. *Journal of Computer information systems, 52*(1), 14-23.
75. WHO, L. (2021). WHO coronavirus disease (COVID-19) dashboard.
76. Wilder-Smith, A., & Freedman, D. O. (2020). Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *Journal of travel medicine*.
77. Zheng, Y., Zhao, K., & Stylianou, A. (2013). The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: An empirical investigation. *Decision Support Systems, 56*, 513-524. doi: https://doi.org/10.1016/j.dss.2012.11.008
78. Zhouu, T. (2011a). An empirical examination of users' post-adoption behaviour of mobile services. *Behaviour & Information Technology, 30*(2), 241-250. doi: 10.1080/0144929X.2010.543702
79. Zhouu, T., & Lu, Y. (2011a). Examining mobile instant messaging user loyalty from the perspectives of network externalities and flow experience. *Computers in Human Behavior, 27*(2), 883-889. doi: https://doi.org/10.1016/j.chb.2010.11.013

FACTORS AND MECHANISMS AFFECTING INNOVATION DEVELOPMENT OF INDUSTRIAL BUSINESS ORGANIZATIONS: COOPERATIVE RESOURCE MODEL

Venelin Terziev
Georgi Rakovski Military Academy, Sofia, Bulgaria
University of Rousse, Rousse, Bulgaria
Kaneff University Hospital, Rousse, Bulgaria
vkterziev@gmail.com

Vladimir Klimuk
Baranavichy State University, Baranavichy, Republic of Belarus
klimuk-vv@yandex.ru

ABSTRACT
In the contemporary conditions of functioning of industrial business organizations the stimulation of innovation activities is defined as the main priority for increasing competitiveness. The paper proposes a model of functioning of organizations aimed at innovation development – a cooperative resource model – with functional blocks and expected results from each member of the cooperation scheme.
Keywords: *Factors, mechanisms, Innovation development, Industrial business organizations, Cooperative resource model*

1. INTRODUCTION

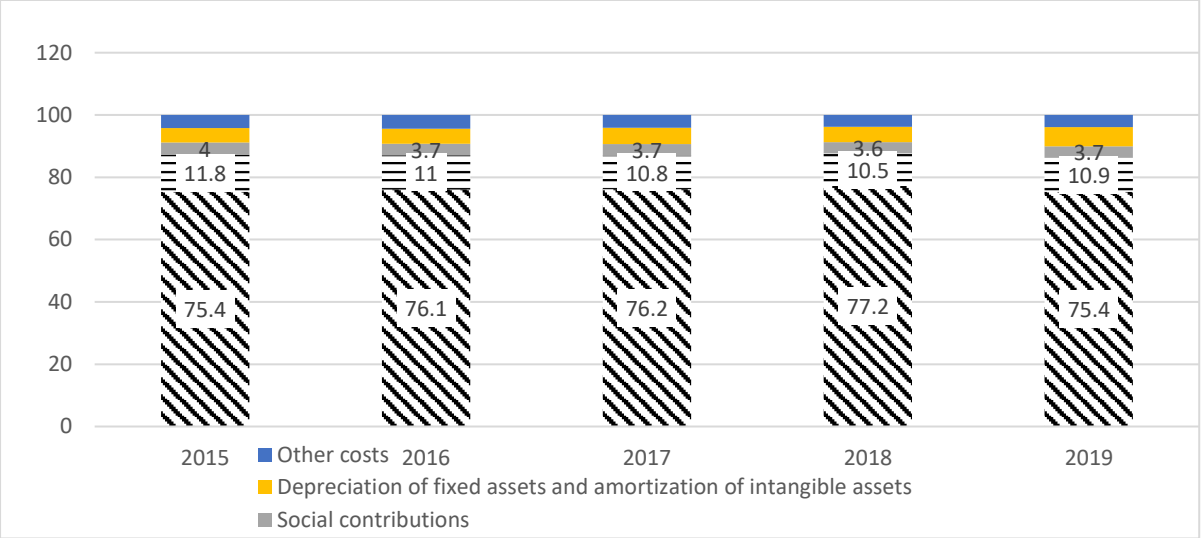
The level of competitiveness of global and national social and economic systems is determined, first of all, by the pace and level of innovation implementation by organizations of different industries. The development of information and communication technologies, the current epidemiological situation, the changed customer preferences and priorities determine the need to create new forms and implement new mechanisms of innovation development and stimulate research and development. By creating more science-based products it will be possible to develop a number of competitive advantages for the country (region, enterprise), providing an opportunity to reduce production costs, create a unique product and increase partner networks (incl. international).

2. FACTORS AND MECHANISMS AFFECTING INNOVATION DEVELOPMENT OF INDUSTRIAL BUSINESS ORGANIZATIONS: COOPERATIVE RESOURCE MODEL

A percentage of scientific activity in the GDP of the Republic of Belarus from 2015 to 2019 has increased from 0,5 to 0,59 % respectively (2020a), which indicates the strengthening role of science in the state. For comparison, the percentage of scientific activity in the Republic of Bulgaria during the first 10 years after accession to the EU had been steadily decreasing (from 0,29% to 0,2% of GDP), which is 3 times less than the EU average (0,64%). The main objective of the National Development Programme of Bulgaria until 2030 is to create a high-quality research infrastructure and modernize the research ecosystem, stimulate the development and implementation of innovation in certain sectors of the economy. At the same time, cooperation between the industry and research centres, development of intellectual potential of specialists and researchers, commercialization of applied research developments should be of utmost importance (2019). The industrial sector is a leading contributor to the gross domestic product (25,7% in the Republic of Belarus in 2019) (2020b). A negative fact is that the freight transport volume of innovative products by industrial organizations decreased by 5,5% in 2019 compared to previous year`s value (until 2019 the average annual growth rate was 28,7%).

Some of the reasons of such a transition include considerable investments in the development of material and technological infrastructure, financial incentives for labour force, changed customer preferences, etc. This is confirmed by an analysis of the industry cost structure of the Republic of Belarus (Fig. 1) (2020b) that determines the development of the strategy for implementing modern high-performance equipment and new technologies, the development of intellectual potential of labour force: the share of material costs decreased to 2,3% in 2019, the share of labour costs increased to 3,8% and the share of depreciation also increased to 24,5% (2020b).

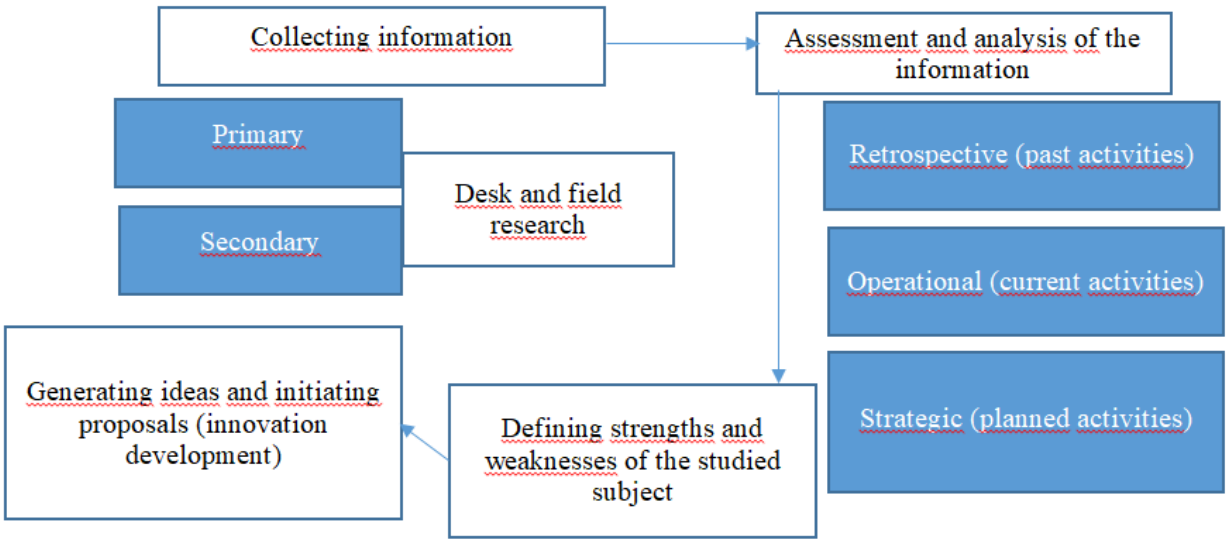
Figure 1: Industry cost structure in the Republic of Belarus in 2015-2019



It is noteworthy that in 2019 the share of freight transport volume of innovative products in the total industrial production decreased by 10,8%. However, this indicator for small organizations increased: from 0,9% in 2018 to 1,4% in 2019, which is due to the state policy to support the development of small and medium-sized enterprises (state subsidies (to the unemployed, those willing to start their own business, incl. in the industrial sector; an annual plan for the implementation of start-up events by the country`s organizations). The share of innovative industry organizations also increased by 1,2% (24,5% in 2019) compared to the previous year`s value, which again indicates the increased role of the state in the implementation of innovation policy. Innovation enables the growth of the competitiveness of the national economy by developing a new and unique product. In the current conditions of development of society each country strives to stimulate the development of its innovation potential, therefore, competition in this area is growing, the process of creating an innovative product is optimized, since except for the novelty the manufacturers have to consider time and durability factors ("viability" of the product – to what extent the innovation will be useful for the industry and the country considering the duration of its impact). Consequently, the innovation process should be complex, multifunctional, creative, time and resource efficient. Enterprises, as initiators and developers of innovation, cannot perform this task by themselves anymore, which includes the growth of competitiveness through innovation development. Enterprises, as representatives of the real sector of the economy, are one of the components of a high quality and fully-fledged process – the implementation of innovation. Cooperation of partners, that are interested in creating an innovation and receiving economic and, of course, social effect from its implementation, would be very effective in developing an innovative product. That is why, for high-quality innovations it is vital to engage as many interested parties as possible, taking into account preferences of end users – beneficiaries, the predicted level of science and technology

development, the pace and vectors of the country`s social and economic development. The most important resource that stimulates innovation is intellectual resource, the development of which is determined by the effective organization and functioning of the education and research sectors. Innovations are developed on the basis of new technologies, new methods, by creating new or improving the existing products (works, services), which is possible only through high-quality research (not necessarily and not always scientific). The research process itself involves a cooperative work of specialists based on the analysis of information (past, current, planned/predicted), the identification of strengths and weaknesses of the studied object (process), the search for opportunities for potential development and the efficiency of the used resources (Fig. 2).

Figure 2: Organizational chart of the interrelation between research and innovation



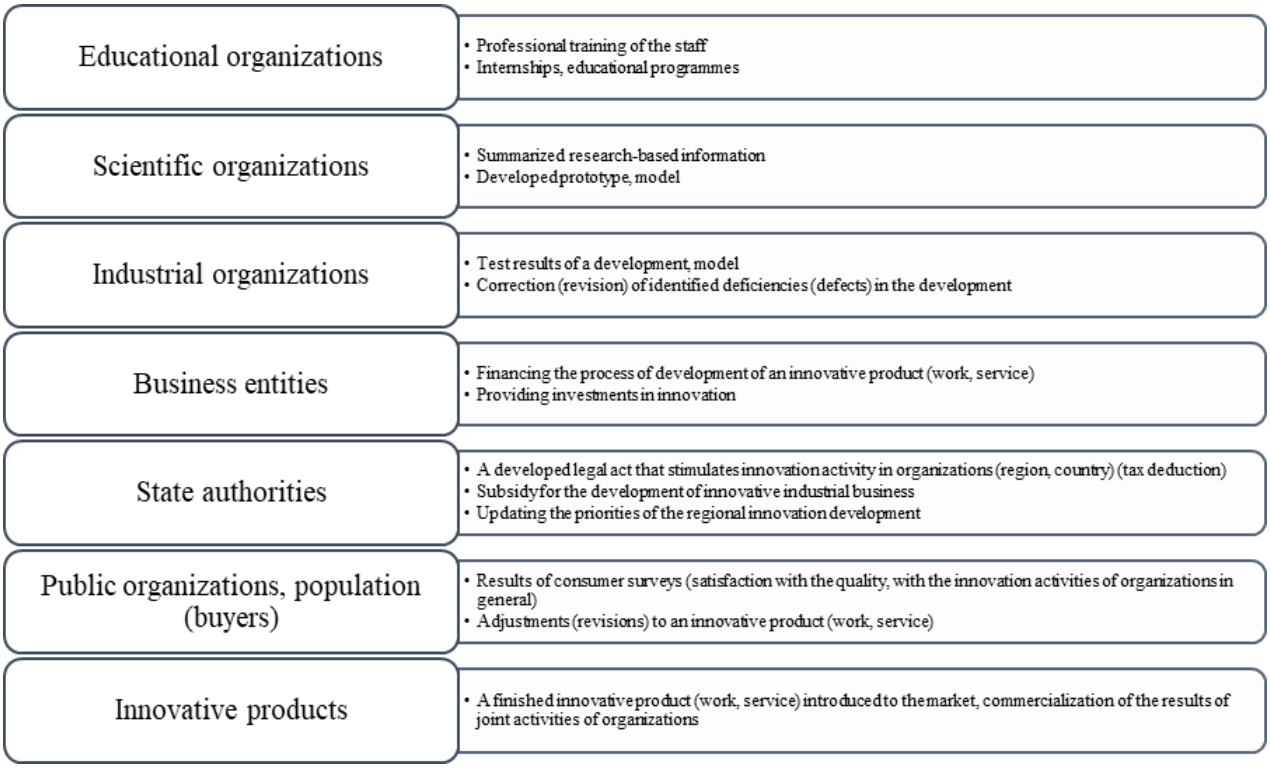
Considering the above-mentioned facts it should be noted that according to art. 19 of the Law of the Republic of Belarus "On State Innovation Policy and Innovation Activities in the Republic of Belarus" (2016), "innovation activities" may include the following:

- performing research and development necessary to transform a novelty into innovation;
- developing a new or improved product, new or improved technology, creating new services and organizational and technical solutions;
- preparing and developing the production of new or improved products, developing the production of new or improved technologies, preparing the implementation of new organizational and technical solutions;
- producing new or improved products, producing products based on new or improved technology;
- introducing for public or personal use new or improved products, new or improved technologies, new services and new organizational and technical solutions;
- other activities aimed at transforming a novelty into innovation" (2016).

By conducting a consistent and comprehensive study it is possible to improve the process (processes), create a new product (work, service), i.e. to implement innovation. The success of this process in one enterprise, a region or country depends on a number of factors that include the development of intellectual potential, scientific and innovation infrastructure, the degree of cooperation between developers, clients, intermediaries (partners), the level of research and others.

The success of the innovation is determined by the quality and effectiveness of cooperation in the process of innovation product (work, service) development between all interested parties, i.e. the real sector of the economy, the business entities, the government sector, public organization and research and education sectors. Thus, the process of innovation is determined by the usefulness of cooperation between these sectors in order to achieve a synergistic effect focused on solving social and economic issues. We define this model of cooperation as a cooperative resource model, which is an effective mechanism of interaction between these sectors based on mutually beneficial use of the resources of partners (members of the association). The "cooperative resource model" represents a system of interrelated and complementary partners – organizations of the real sector of the economy, research and education sector, the business entities, the government sector, public organization, working permanently or temporarily in order to achieve a synergistic social and economic effect in solving the set tasks (a complex of tasks) on the basis of mutual use of the existing and potential resources. One of the main problematic aspects of stimulating and increasing performance (both economic and social) of innovation activity of industrial business is the degree of cooperation between economic entities of the real sector of the economy and education and scientific organizations (research and education sector), representatives of the business community (business sector), state authorities (government sector) and public organizations (consumer sector). Important –developing an innovative product (work, service) based on cooperative and purposeful work done simultaneously or sequentially by each partner-sector (Fig. 3).

Figure 3: Functional blocks and expected outcomes of organizations working within the cooperative resource model



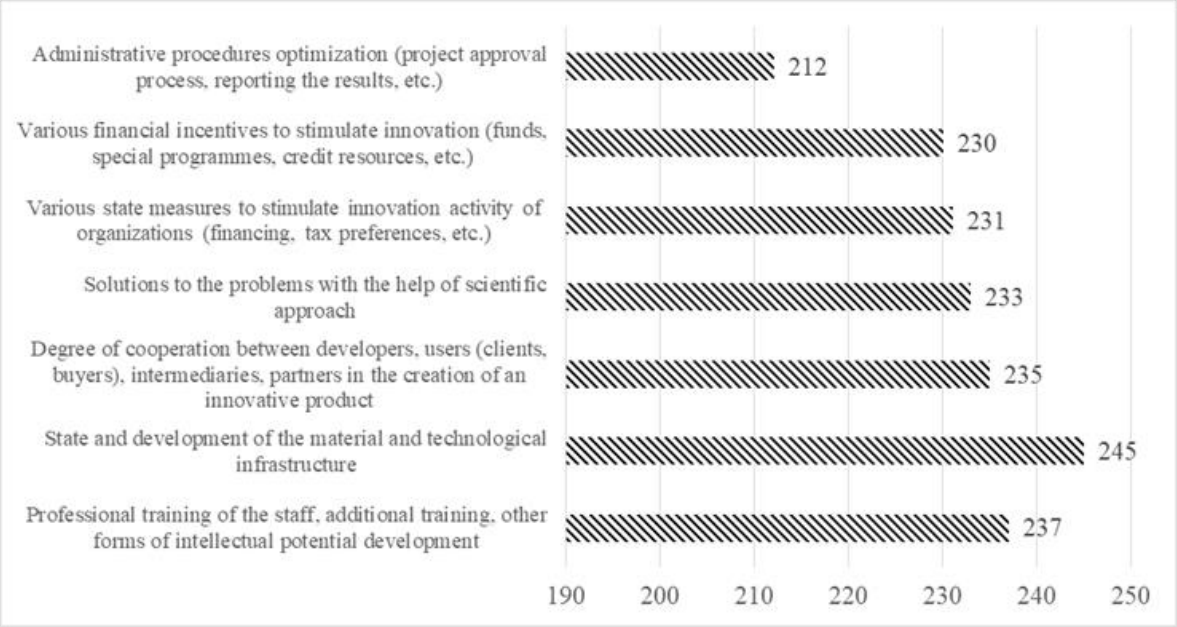
In order to define the main factors that have impact on the innovation activity and the increase of its effectiveness, respectively, the author has developed a survey "Factors affecting innovation development of industrial business organizations" with the help of Google Forms and which is published online (2021a) (Table 1).

Table 1: Results of the survey "Factors affecting innovation development of industrial business organizations" (31/12/2020 – 20/01/2021)

No.	Factors	Evaluation criteria, points					Points, total	Rank	Weight
		1	2	3	4	5			
1	Professional training of the staff, additional training, other forms of intellectual potential development		1	5	15	32	237	2	0,146
2	State and development of the material and technological infrastructure			1	18	34	245	1	0,151
3	Degree of cooperation between developers, users (clients, buyers), intermediaries, partners in the creation of an innovative product			6	18	29	235	3	0,145
4	Solutions to the problems with the help of scientific approach			5	22	26	233	4	0,144
5	Various government measures aimed at stimulating the innovation activity of organizations (funding, tax preferences, etc.)			7	20	26	231	5	0,142
6	Various financial incentives to stimulate innovation (funds, special programmes, credit resources, etc.)		1	7	18	27	230	6	0,142
7	Administrative procedures optimization (project approval process, reporting the results, etc.)		1	15	20	17	212	7	0,131

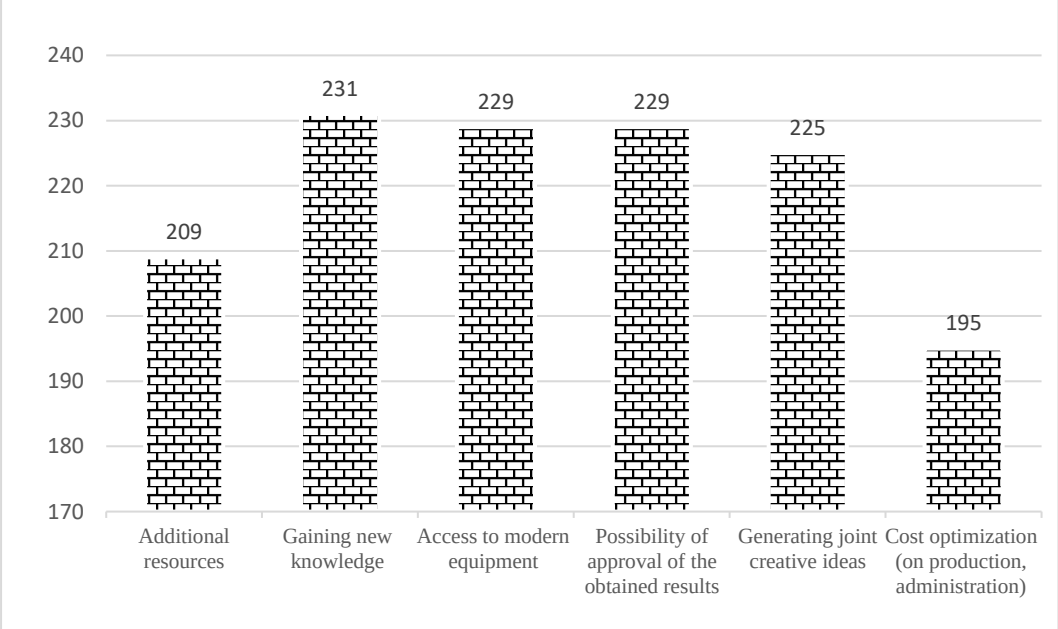
The greatest impact on the success of the innovation development, according to the respondents, has the state and development of material and technological infrastructure (weight coefficient = 0,151), and the least – the administrative procedures optimization (weight coefficient = 0,131) (Fig. 4).

Figure 4: Distribution of the survey results by impact on the success of industrial organization`s innovation activity within the cooperative resource model, points total



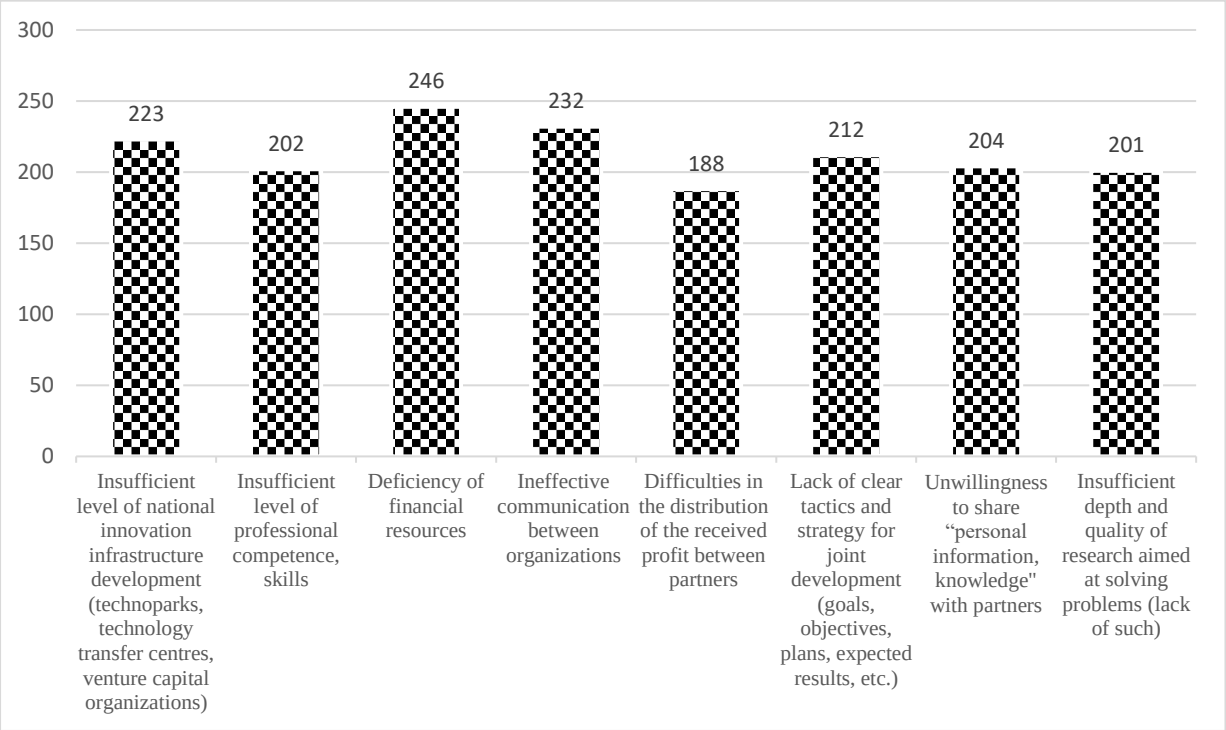
Apart from this, with the help of the survey the author obtained the respondents` opinions on defining the basic objectives for cooperation and the existing problematic aspects resulting from such cooperation between organizations within the cooperative resource model.

Figure 5: Distribution of the survey results by main motivators (goals) for uniting organizations of the scientific and education, real and business sectors, government sector and public organizations in the process of innovation



The analysis of the obtained survey results of representatives of industrial business organizations, representatives of the business sector, government authorities, public organizations, scientific and educational institutions, as well as from buyers of finished products (work, service) of industrial business organizations helped define the factors that have the most and least influence on the innovation success, according to the respondents, and also define the goals (motivators) of cooperation between these organizations in order to create an innovative product and define the problematic aspects. The leading motivator of cooperation between organizations is the vector of intellectual potential development (the factor "Gaining new knowledge in the process of cooperation") (Fig.5). The results of the survey also helped define the problematic aspects that hinder the effective cooperation of the organizations in the cooperative resource model. One of the main problematic aspects include deficiency of financial resources (investments), ineffective communication between the organizations, insufficient level of national innovation infrastructure development (Fig. 6).

Figure 6: Distribution of the survey results by main problematic aspects that hinder the effective cooperation of the organizations



The innovation performance of industrial business is defined as a functional relation of the performance indicator, which depends on the identified factors. As an effective indicator for assessing the performance of innovation we shall define "the share of the freight transport volume of innovative industrial products in the total volume of the production". As a factor indicator we shall define the quantitative manifestation of each factor presented in the survey with the help of Google Forms. For objectivity of the calculations and possibility of predicting the innovation development of industrial business organizations, working within cooperative resource model, each factor according to the survey results is assigned a corresponding weight coefficient (Terziev, Klimuk, 2021d-g). To unify the applied system of indicators and compare the cross-country results we shall present the system of these indicators on the basis of a European innovation scoreboard (Table 2) (2021b; 2020a). This will allow applying the approach to identify weaknesses of the country`s innovation development strategy in terms of global trends and highlight priorities in international cooperation.

Table 2: System of indicators for assessing innovation development of industrial business organizations (in accordance with the European innovation scoreboard (EIS-2019))

Factor	***Indicator***
1. Professional training of the staff, additional training, other forms of intellectual potential development	Number of PhD graduates (ISED 8) per 1000 people aged 25-34
2. State and development of the material and technological infrastructure	Share of R&D expenditures in the commercial sector
3. Degree of cooperation between developers, users (clients, buyers), intermediaries, partners in the creation of an innovative product	Share of SMEs participating in joint innovation projects in the total volume of surveyed organizations
4. Solutions to the problems with the help of scientific approach	Share of employment in knowledge intensive sectors in the total volume of the employment
5. Various government measures aimed at stimulating the innovation activity of organizations (funding, tax preferences, etc.)	Public expenditures on R&D as a share of GDP
6. Various financial incentives to stimulate innovation (funds, special programmes, credit resources, etc.)	Share of SMEs implementing innovation in the country in the total number of SMEs
7. Administrative procedures optimization (project approval process, reporting the results, etc.)	Sale of innovations new to the market and to the enterprise in the general turnover

These indicators should be presented (listed) in a unified form based on the use of relative values (calculations of standardized coefficients) for further statistical analysis. To predict innovation development of industrial business organizations by studying the opportunities of diversification of actual and potential resources, we have analysed the statistical base in terms of the developed system of indicators for 2015-2019. The results were obtained with the help of a powerful software programme IBM SPSS Statistics 26 (2020c), that helped write a regression equation used to develop the predictive models for innovation development of industrial business organizations in the Republic of Belarus: linear and quadratic functions. At the same time, the quadratic functions are derived from the largest correlation coefficient values (Pearson correlation coefficient) from a number of factor indicators with a statistical series of data (Table 3).

Table 3: Types of functions for predictive models for innovation development of industrial business organizations

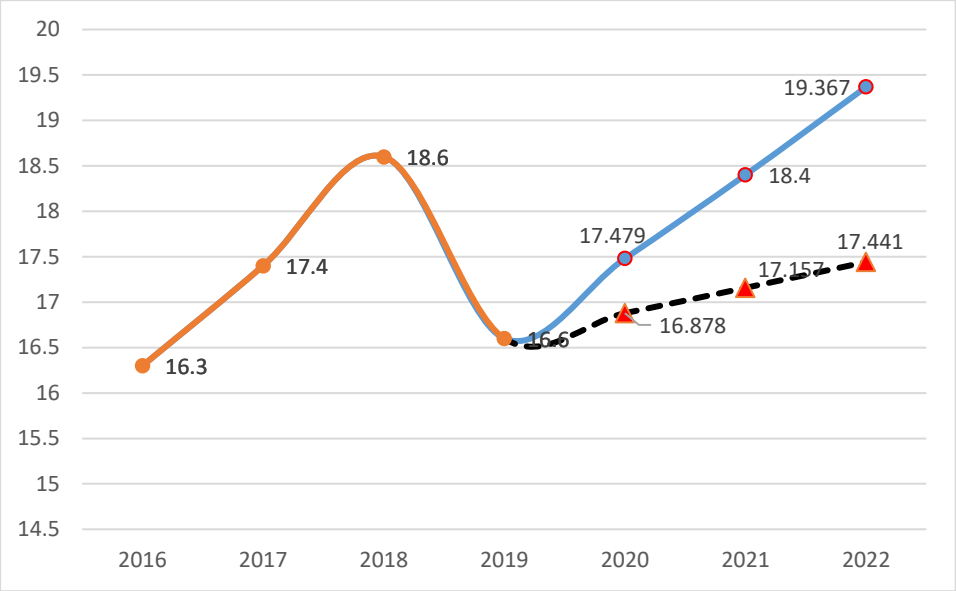
Type of function	*Equation*	*R-square*	*Deviation from the actual value of 2019*
Linear	$E_{innovat} = -0{,}936 - 1{,}033 * Grad_{PhD} + 7{,}5 * Exp_{R\&Dpub} + 1{,}086 * Sale_{innov}$	1,000	+0,002
Quadratic (correlation coefficient $Sale_{innov} = 0{,}992$)	$E_{innovat} = 27{,}638 - 2{,}342 * Sale_{innov} + 0{,}105 * Sale_{innov}^2$	0,986	-0,241
Quadratic (correlation coefficient $Sh_{SMEinnov} = 0{,}954$)	$E_{innovat} = -65{,}947 + 41{,}258 * Sh_{SMEinnov} - 5{,}031 * Sh_{SMEinnov}^2$	0,936	+0,345

Note: explanation of indicators:
$Grad_{PhD}$ – Number of PhD graduates (ISED 8) per 1000 people aged 25-34;
$Exp_{R\&Dpub}$ – Public expenditures on R&D as a share of GDP;
$Sale_{innov}$ – Sale of innovations new to the market and to the enterprise in the general turnover;
$Sh_{SMEinnov}$ – Share of SMEs implementing innovation in the country in the total number of SMEs.

Therefore, to predict the innovation development it is advisable to apply multiple linear regressions.

Let us present the predicted values of the share of freight transport volume of innovative products in 2020-2022 taking into account the 5% growth rate of the factors included in the model (Fig. 7).

Figure 7: Results of modelling predictive scenarios of innovation development of industrial business organizations in a cooperative resource model



Note: red line – actual values, blue line – predicted values of the share of freight transport volume of innovative products (with 5% predicted growth rate of the factors included in the model), dotted black line – predicted values of the share of freight transport volume of innovative products (considering the adjustment factors of the factors included in the model, based on the survey results)

3. CONCLUSION

Based on the analysis of the activities of innovation infrastructure entities we believe that as an effective mechanism for stimulating innovation activity of organizations, industrial business in particular, it is necessary to create innovation alliances, based on the cooperative resource model of mutually beneficial partnerships between the science and education sector, the business sector, the real sector of the economy, the government and public organizations.

LITERATURE:

1. *Research and innovation in the Republic of* Belarus. (2020a), Statistical collection. – Minsk: National statistical committee of the Republic of Belarus, 2020, p. 125.
2. *Annual report of the state and development of research in 2019*. (2019). Ministry of education and science, p. 104.
3. *Industry of the Republic of Belarus*. (2020b). Statistical collection, Minsk: National statistical committee of the Republic of Belarus, 2020, p. 52.
4. *Law of the Republic of Belarus No. 425-3 dated 10 July 2012*, "On State Innovation Policy and Innovation Activities in the Republic of Belarus" (as amended and supplemented on 11 May 2016), (2016).
5. https://docs.google.com/forms/d/e/1FAIpQLSflLqMXQ8q1b9i8VcLWZJTkN8fOTvSg_YvB6fIfjVUNdZE5yA/viewform, (2021a), 03/2021.
6. *Website of the European innovation scoreboard*. (2021b), https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en.

7. *Software programme IBM SPSS Statistics*. (2021c). https://www.ibm.com/products/spss-statistics?lnk=hpmps_bupr.
8. Terziev, V., Klimuk, V. (2021d). *Methodological concepts for modernization of industrial enterprises in the concept of postindustrial development*. // 65th International Scientific Conference on Economic and Social Development – Online Conference, 19 February, 2021, Economic and Social Development (Book of Proceedings), Cakovec, Croatia, 2021, pp.1-5, ISSN 1849-7535.
9. Terziev, V., Klimuk, V. (2021e). *Strategic of models of post-industrial development of industrial enterprises in terms of the concept of national security*. // 65th International Scientific Conference on Economic and Social Development – Online Conference, 19 February, 2021, Economic and Social Development (Book of Proceedings), Cakovec, Croatia, 2021, pp.180-186, ISSN 1849-7535.
10. Terziev, V., Klimuk, V. (2021f). *Modelling the forms of international scientific and educational cooperation*. // 20th RSEP International Economics, Finance & Business Conference – Virtual/Online 17-18 February 2021, Holiday Inn Vienna City, Vienna, Austria, Review of Socio-Economic Perspectives RSEP, Ankara, Turkey, 2021, pp. 151-156, ISBN: 978-605-06961-8-9.
11. Terziev, V., Klimuk, V. (2021g). *Directions for modernization of innovative youth startup design in Belarus*. // 20th RSEP International Economics, Finance & Business Conference – Virtual/Online 17-18 February 2021, Holiday Inn Vienna City, Vienna, Austria, Review of Socio-Economic Perspectives RSEP, Ankara, Turkey, 2021, pp. 157-162, ISBN: 978-605-06961-8-9.

PERSONAL INFORMATION AND THEIR ROLE IN COMPANY MANAGEMENT

Viera Sukalova
University of Zilina in Zilina, Univerzitna 1, 01026 Zilina, Slovakia
viera.sukaloval@fpedas.uniza.sk

ABSTRACT

Today's world is surrounded by technology and the dynamics of the development of technological progress place increasing demands on human resources and care for them. A modern enterprise requires a wealth of information that is diverse; the professional and managerial activity of a company also needs a complex and constantly evolving system. Based on these complex processes, individual information has different meanings. The existence of reliable, detailed and up-to-date information is a necessary condition for human resource management in an organization. They are needed as a basis for decision-making and allow making all analyses of the corporate workforce and the results of its work, the nature of the work, the effectiveness of personnel activities as well as internal conditions affecting the formation and functioning of the corporate workforce. Through technology, it is now possible to provide almost any human resources service and the personnel information system must not be perceived only as a tool for automating personnel work but especially as a tool for strategic management in the organization. Development tendencies of human resources management in Slovak companies are improving. They point out the results of the presented surveys of human resources management and state that from a formal point of view, the situation in the field of Slovak companies is improving. However, it is not always the case that human resources departments ensure the correct conception and methodology of services, but sometimes they focus only on administrative work. The issue of the personnel information system is often misunderstood and there is a lack of control and system in this area. The aim of our research is to analyse the personnel information system on the example of the company, to assess the role of human resources management in supporting the strategic alignment between the information system and personnel work.

Keywords: *Human resources, Management, Personal information, System*

1. INTRODUCTION

The existence of reliable, detailed and up-to-date information is a necessary condition for human resource management in an organization. They are needed as a basis for decision-making and allow you to make all analyses of the company's workforce and the results of its work, the nature of work, the effectiveness of personnel activities as well as internal conditions affecting the formation and functioning of the corporate workforce. In the individual development stages, the changing view of the importance of people and personnel work in the management of the organization is gradually reflected. (Williams et al., 2021) Vasiliev (2020) adds that it is important to find qualified people in a timely and efficient manner, because the competitive advantage of a company is human capital. Organizations therefore pay special attention to the development of the personnel information system. He has the task in the organization to provide reliable and complete information, personnel data about employees, jobs and personnel activities. In the professional literature, we encounter various names of people management in the organization. Koubek (2015) considers the most frequently used terms to be: personnel work, human resources, personnel administration, personnel management or human resources management. Borsíková (2012) also agrees with this term and adds that the terms personnel work and human resources are usually used as the most general designation of the area of people management in an organization.

However, the concept of personnel work is still not clearly defined. It is most often understood by the authors as part of the management of the organization and a set of personnel activities performed by the personnel department and other managers. In general, personnel work deals with everything that concerns a person in connection with the work process. Dvořáková (2012) considers the generation of new information and interpretation of data to be a part of the personnel information system. It also includes an integral set of methods and procedures used to work with information, including rules on access to information. Dvořáková (2009) and Koubek (2007) also emphasize that the personnel information system does not only consist of hardware and software related to personnel processes, but also includes people, forms, processes, procedures and data. The data are comparable to data that were processed manually and stored in paper form before the development of information technology. The main difference is the speed of processing and the larger amount of data provided by today's personal information systems. Human resources management and personnel management indicate different concepts of personnel work and at the same time represent different developmental stages of human resources. In the individual development stages, the changing view of the importance of people and personnel work in the management of the organization is gradually reflected. Nevertheless, we can see them in various forms in organizations to this day. (Williams et al., 2021) Both domestic and foreign authors agree that the company needs information support in its activities. A combination of communication and computer technology is a powerful means of creating effective work. The information system is a system for processing information with subsequent organizational means and these are technical and financial means. The information system includes a set of activities that ensure the transmission, collection, selection, storage, processing, distribution and presentation of information. (Van den Berg et al., 2020) According to Dudinská (1996) the essence of the information system is in providing all the necessary information concerning management and executive activities. It acquires processes and provides the most reliable information to managers. The main task for the information system is to develop the necessary information for the successful management of the organization. An information system is any organized file system or database containing one or more personal data that are systematically processed for the purpose of achieving the purpose. An information system does not only mean an electronic information system but also records of personal data in paper or other form. The aim of our research was on the example of Case study to analyse the processing of personal informations in the company and to identify shortcomings and to propose a system solution.

2. PERSONNEL INFORMATION SYSTEM – NECESSARY PART OF HUMAN RESOURCES MANAGEMENT

Every decision-making process is carried out through information. Therefore, it is important to have information. Decision-making in the field of HRM is conditioned by the use of appropriate personal information. This is information that should be: true, accurate, current, relevant and sufficiently detailed. It is important that a personnel information system is created in the company and that it is constantly developed.

2.1. Personnel information system development

Development tendencies of human resources management in Slovak companies are improving. The results of the presented surveys of human resources management point to this and state that from a formal point of view, the situation in the area of Slovak companies is better than in the past. However, it is not always the case that human resources departments ensure the correct conception and methodology of services, but sometimes they focus only on administrative work. The question also arises as to whether there may be appropriateness, uniformity and purpose for all the procedures used.

In his article for an economic magazine, Kachanakova (2002) further states that various surveys point to top management that does not fully accept the importance of human resource management. The issue of the personnel information system is still misunderstood and there is a lack of control and system in this area. Job analysis, which serves as a basis for systematic human resource management, still depends on a subjective managerial perspective. Methods of finding and selecting employees can also have disadvantages. Not many companies use available educational institutions or specialized recruitment and consulting agencies. They mainly trust the interview and neglect, for example, the assessment centre, which provides useful information about the candidate. (Kachanakova, 2002) Snieska (2020) agrees with this statement, adding that in order to attract and retain a sufficient number of qualified workers, it is necessary to look for useful ways and methods. Work and career expectations differ from those of older generations. The aim is to discuss new labour market challenges and address the human resources management process that employers should provide to recruit, employ and develop their employees. With the advent of information technology, which has made it easier to process personal data, an important question has arisen regarding the protection of data against their misuse. This issue is regulated in the Criminal Code - sanctions for unauthorized handling of personal data, sanctions for unauthorized access. Personnel departments use the personnel information system to change salary - wage conditions, to register employees and the like. Few companies use the system to plan employees or monitor skills, as well as prepare data for analysis and follow-up. One of the definitions of a personal information system is that it is a web-based system that provides information about employees in the company. Koubek (2007) defines a personnel information system as an organized computer system for detecting, processing, storing and providing information about everything related to personnel work in an organization. An integral part of the personal information system is a set of methods and procedures used in working with information, including rules on access to this information. In practice, we are looking for a compromise that is suitable for the functioning of the organization. An information system is effective if it has both internal and external efficiency. Internal efficiency means a rational arrangement to make it as cheap as possible. External efficiency is achieved on the basis of information provided to management. Oehlhorn (2020) further adds that in terms of information systems, organizations seeking to leverage the strategic alignment of information technology and human resources often underestimate the role of human resource management in creating business value. The aim should be to assess the role of human resource management in promoting strategic alignment between the information system and staffing.

2.2. Personnel records

The primary personnel activities include personnel records. It contains all the information about all employees and persons who belong to the company. This information may have been processed differently in each business and may have a different scope or content. However, they should contain at least the basic data provided by the legislation. The legislation also implies the keeping of personnel documentation, which is also an important part of the organization. (Koubek, 2015). Personnel records are divided into records of labour relations and records of persons. Data that are most frequently listed in the register of persons are as follows:

- Personal identification data of employees
- Addresses and contact details
- Data on qualifications and education attained
- Data on previous employment
- Information about family members
- Data on work restrictions

Koubek (2015) further states that the register of employment relations contains information between the employee and the workplace:

- Data on employment (date of establishment, type, probationary period, date of termination)
- Job function data
- Description and scope of work
- Description of working hours
- Holiday details
- Wage data
- Accounting information

It is the personnel information system that is suitable for keeping this data, although some data must also be in paper form. Quick display and clarity is a great advantage of keeping records in the system. All data are processed there from the beginning and thus from the placement of the employee in the job position to his termination of work in the company. The database with data should be the only source of data on employees, the data in the system can be viewed, generate various documents or monitor the development of the employee during employment. (Dvorakova, 2012)

2.3. Tasks and types of personnel information system

According to Koubek (2015), the personnel information system performs the following tasks:

- Manages information about all employees in the company
- Analyses employee information
- Informs employees about safety and emergencies
- The role of personal data administration
- Monitors wages, finances, accounting systems
- Monitors job seekers and maintains resumes
- Facilitates and speeds up personnel work for HR professionals
- Creates comprehensive analyses and thus provides a better basis for decision-making
- Takes care of employee attendance

Koubek (2009) says that "a necessary condition of personnel work in the organization is the existence of reliable, detailed and up-to-date information needed for decision-making and to perform all necessary analyses of the organization's workforce and results of work, nature of work and jobs, efficiency of personnel activities and external conditions affecting the formation and functioning of company staff. Therefore, it is necessary to create and continuously develop the personnel information system of the organization. "This system consists of four other subsystems - the basic types of personnel information system. The first type is employee information. This is basic information such as personal identification data, data on classification and work performed so far, data on education, remuneration, skills and knowledge and the like. There should also be additional information such as a CV, documents on previous experience, references from previous employers and the like. The second type is job information. This subsystem should contain data such as job category, place of work, whether the job is vacant or occupied, is at risk, whether the work is sedentary, whether it is suitable for men or women, and so on. The third type is information on personnel activities. These include, for example, the methods used and job creation analyses, the questionnaires used, the methods used to plan workers' needs, the methods of evaluating workers, collective agreements and the like. The last fourth type is information on external conditions. They influence the formation and functioning of the workforce.

They contain information on market developments and situations, health statistics, whether there is competition near the company, legislation on the employment of people and the like. (Horvathova et al., 2017)

2.4. Properties of the personal information system

In his publication, Sojka (2009) states the basic characteristics on the basis of which they should decide in the company when choosing a suitable personnel information system:

- Functionality - the decisions that the company makes do not only concern the current situation but also decisions in the future. Over time, the company expands with new buildings, needs new employees for new jobs and expands the range. Therefore, great importance is placed on the management of human resources in the personnel information system
- Modularity - the structure of the company has its departments, which, despite their different tasks, perform the same function and there is a relationship between them; an information system also works on a similar system. It consists of modules, but each represents a separate part of the system. Depending on the financial possibilities, companies implement their modules and it is most effective if all components in the company are involved. The modules have a composition such as: wages and salaries, human resources, education, appraisal, attendance, social policy and the like.
- Integrity - each data is stored only once. It is important that the activities of the individual modules are linked and coordinated. If each one worked separately, the update could be slowed down
- Parameterizability - it is necessary to adapt to the current conditions in which the company is in the implementation of the information system. It is suitable if the system offers a change and modification of the data of the given elements and we do not have to rework the whole system.
- Data protection and security - Because there is a wealth of data and important information in an organization, its leakage could significantly harm it. This data must be provided within the personnel information system, some are intended only for a very narrow circle of employees. (Sojka, 2009)

To increase the quality and efficiency of the processing of information on the selection of employees, automation based on the support of managerial tasks and responsibilities is increasingly used. Unlike traditional automation applications, little is known about how the implementation of automation for managerial change changes managerial work. Employee selection examines how different versions of automated decision support systems affect decision time, task responses, self-efficacy in staff selection, and so on. (Langer, 2020) Employee rewards and career prospects often depend on how their superiors perceive their performance. However, assessing employee performance is often difficult. In foreign models, we can see an effort to provide an employee with a performance assessment in order to influence his or her self-confidence as well as his or her own credibility in assessing performance; it is clear that performance measurement is an essential part of any enterprise system. (Kamphorst, 2018).

3. RESEARCH RESULTS AND DISCUSSION

We conducted our Case study in an electronics manufacturing company that offers a wide range of services in the field of electronics production and supplies equipment for various industries such as telecommunications, automotive, control systems, security systems and the like.

The company has been successfully operating on the European market in this area since 2006; employs 126 employees, of which 6 in managerial positions. We used the method interview, oservetion and the questionnaire survey of the satisfaction of managers with the personnel information system in the company analysed by us contained 15 questions, of which the first three questions were identifying. The questionnaire was filled in by the company's executives and focused not only on the current personnel information system in the company, but also on the possibility of introducing a new information system.

3.1. Analysis of the personnel information processing

We found out that the company does not have a human resources department that would cover all tasks related to human resources. These tasks are divided among several managers and so disagreements can sometimes arise, which can ultimately harm the employee. Each partition processes the files itself, and sometimes the tables are not uniform. If someone needs information from another personnel area, it is necessary, in addition to looking for the table itself, to ask for additional explanation. The current accounting and personnel software that the company uses is Kros, which has been on the market for more than 25 years. In the past, any personnel records were kept through Excel and Word files. The Olymp program processes double-entry bookkeeping, daily invoicing, stock, payroll, financial statements, as well as tax returns. The system is used in the company mainly for the fulfilment of accounting obligations and only a small part is used for personnel processing. We analysed the personnel activities that we described in the theoretical part with the company manager and, using the interview method, we ascertained their use within the Olymp program from Kros. Personnel records are the necessary part of the company management and also a legal obligation. The company is managed through the Olymp program and is processed when an employee is hired in the company. Upon taking up employment, the employee will bring all the necessary documents required by the company. It is a certificate from which the assistant director will make a copy, a personal questionnaire, an extract from the criminal record and a personal CV. An identity card is a matter of course, there is the data needed to keep records. The existence of all these documents and data shall be recorded in a table in the Olymp program under the serial number and shall be stored and archived in paper form under this number. The table shall also indicate when the employee terminates the employment relationship, or any other fact concerning the employee. The company is obliged to comply with the laws on personal data protection as well as on the registration of such data. The personal data that this program allows to enter are, in addition to basic data, additional data such as: nationality, education, field of study, health insurance company, health restrictions, type of employment, whether the employee has a regular or irregular income and the like. The system contains all personal data about employees and any change must be reported by the employee and informed by the company's managers. The change is recorded in the system, saved and the data is checked once a year. The assistant director and the economic department, with whom we interviewed the personnel records, have no major reservations about the actual entry of data into the system and the information they process in the program is sufficient for the successful operation of the company. The result is a clear record, which is created by these departments. In terms of efficiency and time, this may not be the best solution, as quick compliance is not always possible. The information is first processed by the assistant director; they are passed to the manager of the company for inspection, who then passes it to the economic department. When an employee joins the job, the accuracy of the data is still checked by the production foreman, who has the employee under his management. This process is quite lengthy and time consuming.

3.2. Identification of problems in personnel information management

We would like to introduce some chosen problems of the information management:

- Job creation and analysis
  This is the definition of job tasks for subordinates and the division of these tasks into jobs according to the needs of the company. There are no records in the company for job analysis. The definition of tasks and the associated responsibilities and powers, the description of jobs and the updating of these data are described in the employment contract. The processing of data on jobs and requirements for employees and the subsequent creation of job descriptions is the task of the company's manager. The job description does not have a uniform form and the company does not have a system for storing specifications and descriptions. Adjusting work activities could save a lot of time and create space for better business development.

- Performance management and employee evaluation
  It is an important attribute in the field of human resources management. By analysing the performance management, we found that the company lacks information about the results. There are no tables or system where it would be possible to find all the necessary information in the future. Work performance management takes place on a monthly basis. The master in production evaluates the performance of employees and checks compliance with standards. However, the results are not recorded or stored for future reference. Remuneration of employees is the responsibility of the economic department, as attendance data are recorded in the Olymp program on a monthly basis. These data will be provided by the company manager, who generates them from the Finger attendance system, which we will describe in the next subchapter of the diploma thesis. By analysing this work activity, we found that the company records the necessary information, but it is a longer process. By connecting the system or setting up a new system, communication between the company manager and the economic department would be easier and faster.

- Registration of working hours
  Working time is the time spent in the company to perform and fulfil work tasks. By law, employees are provided with a work break and continuous work rest among the changes that every employer must respect. All employees, i.e. permanent employees as well as employees for trade, are obliged to keep daily records of their working hours in the attendance system. The system that the company uses is called Finger and is intended for use in small and large companies but also in government. It supports several login methods; companies can use fingerprints, PIN codes or RFID cards. This modern terminal has a touch screen and is set up in the company to accurately identify the employee, because it records a fingerprint that is unique to each person. The online terminal records the times of arrivals and departures from work, and this data is projected via a LAN network into a program on a computer, which is controlled and managed by the company's manager. Upon arrival at work, the employee presses his finger on the terminal monitor, scans the fingerprint and transmits the time of arrival to the program. The same procedure applies when an employee leaves work. In the company, the terminal is set automatically for departure and arrival functions, but in practice it is also possible to record breaks, business trips or holidays. However, if an employee forgets to scan his fingerprint, the system will not be able to evaluate that the required eight-hour working hours have ended and record the time until he rescans his finger. This is where the problem arises, because the business manager has to record the erroneous event manually, it is not possible to correct it systemically. The record of working hours can only be checked in a program designed for that purpose and exclusively by the company's manager, unless he entrusts this task to one of the other

managers. The employee cannot check this data in the terminal and thus does not have an overview of how his working time is recorded. This attendance system has a number of functions, it can mention, for example, the generation of attendance for groups or individuals, the setting of automatic backups and exports, the flexible setting of rounding of departures and arrivals and the like. One of the functions is also that this output can be made into another file, for example, data can be exported to XLS, PDF or CSV. The company uses this function every month because it exports the data to a payroll worker, who translates it manually into the Olymp payroll program from Kros, which we mentioned in the introduction. From the above information and description, it follows that the Olymp program is only partially used for personnel activities; the system does not bring simplification of work and efficiency in the company. In this program, only basic information about employees is processed in the area of personnel activities, and in the personnel records section, we also provided an illustrative example from the program itself. The system is also used for remuneration, where data from the attendance system, which we also described above, are entered into the program. The program is used in the economic department mainly for accounting cases and payroll processing.

The results of the analysis and the questionnaire survey show that the current Olymp system in the company is used only for payroll processing. A significant part and results of personnel activities are recorded in several MS Office applications, which are not interconnected. This results in inefficient and lengthy work. We also found that the Finger attendance system used by the company is suitable, but it is not linked to other programs. All subjects of management participate in the registration and control, and thus there is a discrepancy and unnecessary duplication of work. With the help of the analysis of individual personnel activities, we were able to better understand the situation in the company and we were able to supplement the missing information for proposing a solution with a questionnaire survey. In the company, some personnel activities are at a relatively good level, but we can say that it chaotically processes information about its employees and each manager is in charge of a certain personnel area. The introduction of a personal information system would have significant benefits for the company and as we mentioned in the theoretical part, it would certainly be improving and facilitating work; increase efficiency and speed up work in the field of human resources and speeding up information updates. The personnel information system is an organized way of recording data on employees; the information is true, up-to-date, detailed and eliminates lengthy manual registration of employees. There are various ways a company can run a personal information system. It is not created in this company, or only partially. Through external services that are currently offered, it is possible to implement a system in the company that would contain all the necessary data related to human resources. It is about outsourcing various activities related to personnel work. The reason for choosing outsourcing can be financial savings and advantageous cooperation between both partners.

3.3. Proposed procedure for implementing the personal information system

In order to create or implement a suitable personnel information system, it is necessary to determine the current and future needs in the company and define what information and messages will be required from the system in the form of inputs and outputs. Together with the director and manager of the company, we have created steps that should precede the selection of a suitable personnel information system for the company:

1) Defining the goal - in our case it is a matter of speeding up the work in the field of administration and harmonization of all actions related to human resources.
2) Defining benefits and costs - finding out whether the introduction of a new personnel information system in the company will financially burden the company or will be a benefit.

3) Define what is expected from the system and what the company will use.
4) Define which applications and programs will be suitable to set up in the new personal information system so that their use is simple and undemanding.
5) Define whether it is necessary to employ a person - human resources, who will be in charge of a comprehensive set of activities and tasks related to human resources in the established system.

The HR specialist performs all the work related to the personnel activities in each company, regardless of the company's focus. It must therefore procure all the activities which are connected with the staff member, from his selection, recruitment, care and changes in employment to his dismissal. The personnel must provide various labour market surveys, write and supplement the company's guidelines according to applicable laws, care for employees in everything, whether in the field of education, health care, remuneration, placement of employees in the company and the like. In the company monitored by us, such a person is missing and personnel activities are divided into all subjects of management, which leads to lengthy and inefficient work. Some of the personnel work is done by an assistant, a certain economic department, something is a foreman in production, and everything must ultimately be approved by the company's manager, and this may not always lead to compliance and disagreements may occur. A suitable personal information system for our Case study is HUMANA system on the Slovak market that would meet company requirements. This information system covers all processes related to human resources, human resources management, salaries and attendance. It simplifies work and streamlines the operation of the company. The main advantages that the system offers are timeliness, clarity, flexibility, creation of own reports and outputs, data sharing and history. The system can monitor the records in chronological order, get an overview of the employee's development, salary, training and his overall movement in the company; it is regularly updated and offers the possibility to create new items, employee data is automatically available with the ability to track previous adjustments to the system. Each system module is linked and updated automatically; the system contains modules, the combination of which can cover all needs.

4. CONCLUSIONS

The years 2020 and 2021 are specific to almost all companies and it is caused by a Covid 19 pandemic. Pandemic times have changed behaviour not only in everyday life, but also at work. The area of human resources had to deal with unexpected and new tasks, and the role of these departments changed in part. The main challenge in the company we are monitoring at this time is to stay on the market and react quickly to the situation. Therefore, it is very important to have a well-functioning personnel information system set up, thanks to which the processes in the field of human resources and, ultimately, the entire functioning of the company will be accelerated. It is very important for the company to set up a simple and functional system, because it would improve efficiency and speed in the field of human resources, chaotic entry of personal data would be simplified and information obtained from training or employee evaluation would be stored for further processing. It is necessary for the personnel information system to provide a wide range of information, because it is used not only for processing records (number of employees, overtime, incapacity for work, exhausted leave, maternity leave, etc.) but also the possible implementation of analysis of jobs, workforce, work efficiency and the like. It is intended to provide current information, i.e. continuously supplemented, but also historical. Personnel specialists usually carry out activities from the collection, storage to distribution of personnel information. The system is connected to external and internal information systems, and one-way or two-way communication occurs during the network connection.

One-way communication is provided by a centrally managed system and information is stored in a central data bank. Two-way communication works on the mutual cooperation of all those who are connected to a computer network. These are, for example, social and health insurance offices, labour offices, the statistical office and the like. The work with personal information needs system solution.

ACKNOWLEDGEMENT: *This paper is an output of the Science project VEGA No. 1/0619/20 Fundamental research of quantitative and qualitative determinants of innovation potential and innovation performance of a company in relation to increasing its competitiveness.*

LITERATURE:

1. Borsikova, B. 2012. Riadenie ľudských zdrojov a personálny marketing. Prešov: Michal Vaško, 120 p.
2. Dudinska, E. 1996. *Manažérska informatika*. Košice: Publishing, 128 p.
3. Dvořakova, Z. 2009. *Management lidských zdrojú*. 1. vyd. Praha: C.H. Beck, 512 p.
4. Dvořakova, Z. et al. 2012. *Řízení lidských zdrojú*. Praha: C.H. Beck, 559 p.
5. Horvathova, P., Blaha, J., Čopikova, A. 2017. *Řízení lidských zdroju*. Praha: Managment Press, 240 p.
6. Kachanakova, A. et al.. 2002. Development tendencies of human resources management in Slovak companies. In: *Ekonomický časopis.* Ekonomická univerzita v Bratislave, 50 (2). pp. 235-256.
7. Kamphorst, JJ.A.; Swank, O.H. 2018. The role of performance appraisals in motivating employees. In: *Journal of economics & management strategy*. 27(2). pp. 251-269, DOI:10.11111/jems.12241.
8. Koubek, J. 2007. Řízení lidských zdrojú: Základy moderní personalistiky. Praha: Management Press, 289 p.
9. Koubek, J. 2015. Řízení lidských zdrojú: základy moderní personalistiky. 5. rožšírené a doplnené vydanie. Praha: Management Press, 399 p.
10. Langer, M.; König, C.J. Busch, V. 2020. Changing the means of managerial works: effect of automated decision support systems on personnel selection tasks. In: *Journal of business and psychology*. DOI: 10.1007/s10869-020-09711-6. ISSN 0889-3268.
11. Oelhorn, CE.; Laumer, S.; Weitzel, T. 2020. Human resource management and its impact on strategic busines – alignment. In: *Journal of strategic information systems.* 29 (4), DOI: 10.1016/j.jsis.2020.101641.
12. Snieska, V. et al. 2020. Fundamental human resource management practices aimed at dealing with new challenges in the labour market. In: *Transformations in business & economics*. 19 (2). pp. 38-51.
13. Sojka, L. et al. 2009. *Riadenie ľudských zdrojov.* Prešov: Prešovská univerzita v Prešove, ISBN 978-80-8068-871-4.
14. Van den Berg, M.; Marius W. Stander, M.W.; Van der Vaart, L. 2020. An exploration of key human resource practitioner competencies in a digitaly transformed organisation. In: *Sa journal of human resource management*. VL 18. DOI: 10.4102/sajhrm.v18i0.1404.
15. Vasiliev, V.A. Vasiliev, V. A. ;Velmakina, Yu. V. ;Mayborodin, A. B. ;Aleksandrova, S. V. 2020. Use of information technologies for the enterprise quality management system with the requirements of the related standards. In: *Russian metallurgy.*2020(13), pp. 1644-1648. DOI: 10.1134/S0036029520130388.
16. Williams, P.; MCDonald P.; Mayes R. 2020. Recruitment in the gig economy: attraction and selection on digital platforms. In: *International journal of human resource management*. DOI: 10.1080/09585192.2020.1867613.

ELEMENTS OF CONCEPT OF SUSTAINABLE DEVELOPMENT REALISED THROUGH PROJECT

Ewa Kozien
Cracow University of Economics, Faculty of Economics and International Relations,
Department of Management Strategy and Organization,
ul. Rakowicka 27, 31-510 Cracow, Poland
koziene@uek.krakow.pl

ABSTRACT

In philosophical, religious and social doctrines one can find, at all stages of historical development, an idea initially defined as harmonious, and then as sustainable development in the context of civilization development. When analyzing the development of the concept of sustainable development, one can notice its evolution from an environmental concept through social and economic aspects to an attempt to create a holistic concept of an interdisciplinary nature. The concept, originally based on three pillars: environmental, social and economic (economic), is currently evolving towards a holistic concept of sustainable development in all areas of political, social, economic, environmental, cultural and legal life. At the same time, the interpretation of the concept itself remains a problematic issue, because today the concept of sustainable development is a vague and undefined concept, as well as containing various ideas presented both in science and in practice. Regardless of this, you can indicate the basic goals and elements that make up the understanding of the concept of sustainable development. The concept of sustainable development, as it is interdisciplinary in nature, can also find application in the science of management, in the area of project management, both from the theoretical and practical side. Nowadays, when implementing various projects, it is necessary in their preparation, implementation and evaluation to take into account the sustainable development goals, which is beneficial both from the formal point of view, and therefore, for example, from the requirements for supporting the implementation of projects by European Union and / or national programs, but also the actual one, as it allows for the implementation of the economic, social and ecological element of the concept of sustainable development through projects in accordance with the policy and development strategy of the state and the organization. The aim of the article is to analyze and evaluate the achievement of the goals of the sustainable development concept in terms of three pillars: society, environment, economy through projects implemented in Poland, in the Głogów commune in the Dolnośląskie Voivodeship, in the years 2004-2020 from an economic perspective.

Keywords: *sustainable development, project, project management*

1. INTRODUCTION

In philosophical, religious and social doctrines one can find, at all stages of historical development, an idea initially defined as harmonious, and then as sustainable development in the context of civilization development. The very concept of "sustainable" in economic terms initially referred to forest management in such a way as to ensure the possibility of restoring forest resources, as mentioned by H.C. von Carlowitz in the work Sylvicultera oeconomica, Oder Haußwirthliche Nachricht und Naturmäßige Anweisung Zur Wilden Baum-Zucht (Kasprzak, Raszka, 2008; Carlowitz, 1713). On the other hand, the relationship between economic development, the natural environment and social welfare was noticed by R. Carson (Carson, 2002). Currently, the concern for sustainable development is the subject of human activities undertaken from an institutional and legislative perspective and considered in the international, regional and local dimensions. Sustainable development is a commonly known, interdisciplinary concept explained and discussed by politicians, economists and lawyers,

because its interpretation is not consistent and unambiguous. In the literature on the subject, one can find too general or more specific definitions. A general commonly cited definition is found in the 1987 Brundtland report, where "sustainable development is intended to imply intergenerational fairness both in the short and in the long run" (Dovers, Handmer, 1993).

The analysis of many definitions of sustainable development in the literature on the subject allows us to identify the basic elements that define sustainable development:

- a concept combining the following elements: economic development, social development and environmental protection,
- an intergenerational concept that takes into account a longer time perspective of undertaken actions,
- a process that integrates all human activities,
- a concept that particularly emphasizes intangible values (Florczak, 2011).

It should be emphasized that sustainable development is the basic principle shaping the multidimensional international, regional and national policy, as well as defining the development strategy at the global and national level. The architecture of the concept of sustainable development includes three basic interrelated pillars: economic development, social development and environmental protection. Economic development interpreted as a process of changes contributing to an increase in the level of quality of life (prosperity) in connection with the maintenance of well-being, i.e. maintaining sustainable social development, as well as maintaining a high-quality natural environment, allows for a comprehensive approach to the concept of sustainable development. It should be mentioned that the maintenance and balancing of development in terms of the three main elements of the concept of sustainable development may be disrupted as a result of an economic crisis or armed conflicts. It should also be emphasized that of the three mentioned pillars of the concept of sustainable development, the most attention was initially devoted to environmental issues. This is due to the fact that during the development of civilization, social and economic progress very often took place at the expense of the natural system. The concept of sustainable development is effectively implemented in practice through projects implemented in public-private partnerships, which are consistent with the development strategy defined at the level of the state and local government units, as well as enterprises. The aim of the article is to analyze and evaluate the achievement of the goals of the sustainable development concept in terms of three pillars: society, environment, economy through projects implemented in Poland, in the Głogów commune in the Dolnośląskie Voivodeship, in the years 2004-2020 from an economic perspective.

2. THE ESSENCE OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Economics is a scientific field that deals with the optimization of social needs in conditions of limited resources. The scarcity of resources, the problem of social inequalities, and the violation of the ecosystem refer directly to the economic, social and environmental aspects of the concept of sustainable development. The implementation of the three pillars of the concept requires comprehensive consideration and its implementation at the macro, meso and micro levels. The concept of sustainable development is recognized as a doctrine of political economy (Rutkowska-Podołowska, Pakulska, 2011), which is specified in the formulated Sustainable Development Goals. In economics, issues of economic goods are taken up, while nowadays a broader and responsible economic approach is necessary, which will also take into account environmental goods (Adamczyk, 2007) and social issues (Kozień, 2021).

In economics, the issue of economic growth is analyzed from the perspective of the following development theories:

- neoclassical growth theory combined with liberal growth and economic development policies,
- a new growth theory (endogenous growth),
- theory of the real business cycle,
- the theory of sustainable development (Adamczyk, 2007; Fiedor, 1990).

However, only in the theory of sustainable development, sustainable development is the condition for the sustainability of growth (Adamczyk, 2007). The literature on the subject emphasizes that "the concept of sustainable development postulates a complete reform of the dominant economic theory" (Rogall, 2010). It should be noted, however, that it does not violate the basic assumptions of the neoliberal paradigm - the theory of economic growth (Matysiak, Struś 2015). The idea of sustainable development has an interdisciplinary dimension and is the subject of research by political scientists, lawyers and economists. The interdisciplinarity of the concept of sustainable development can be found in the interpretation of the idea by D. Pearce and R.K. Turner, who stated that sustainable development: "is about maximizing the net benefits of economic development, while protecting and ensuring that the usefulness and quality of natural resources are restored in the long term. Economic development must then mean not only an increase in per capita income, but also the improvement of other elements of social welfare. It must also include the necessary structural changes in the economy and in society as a whole" (Pearce, Turner, 1990; Adamczyk, 2007). In the second half of the 20th century, the concept of sustainable development emphasized the impact of global economic factors on the occurrence of unfavorable changes in the natural environment (Kozien, Kozien, 2018b). The emergence of the concept of sustainable development was a reaction to the emergence of unfavorable changes in the natural environment as a result of unlimited human economic activity (Kielin, 2013). The problem of balance between human activities and their impact on the environment was also highlighted by M. Sommerville, who warns against violating it (Sommerville, 1862; Kielin, 2013). The analysis of the development of the idea of human influence on the natural environment contributed to the shaping of the concept of sustainable development over time. When analyzing various aspects of the idea of sustainable development, it is emphasized that conducting production activities related to satisfying human existential needs should take place with the smallest possible impact on the environment (Nowicki, 2007). In the 1980s, bearing in mind globalization and the dynamics of economic changes, the concept of sustainable development was defined, assuming that it will be possible to improve the economic situation of countries through GDP growth, ensuring an appropriate amount of goods and services that meet basic social needs, as well as improving the quality of life and ensuring concern for the preservation of natural capital (Hull, 2011). In the emphasized ecological aspect, the concept of sustainable development is based on the assumption that a compromise solution is possible between further economic development, undertaking entrepreneurial activities and preserving the environment in the best condition while maintaining the guarantee of meeting the needs of the present generations, without limiting the possibility of meeting the needs of future generations (World Commission..., 1987; Kozień, 1999). This aspect is also raised by B. Piontek, who formulates a synthetic definition of sustainable development, interpreting it as: "effective improvement of the quality of life of modern and future generations by shaping the correct proportions between economic, human and natural capital" (Piontek, 2010). To sum up, in the above-mentioned definitions, the idea of sustainable development covers three basic aspects: economic, social and environment, where the relationship of sustainable actions undertaken in three distinguished elements in the context of maintaining natural balance for future generations is particularly emphasized.

The implementation of the idea of sustainable development was possible through the introduction of legal instruments in acts of local, state and international law (Kozień, Kozień, 2019). The concept of sustainable development had a significant impact on the shape of international legislation, as well as individual countries, becoming a legal principle or program standard in the field of administrative law (Dobosz, 2015). The concept of sustainable development has also been implemented in the primary and secondary law of the European Communities, and then the European Union, especially in the Treaty on the Functioning of the European Union and the Treaty on European Union (the so-called Lisbon Treaty). In the Polish Act of 27 April 2001 – Environmental law, sustainable development is interpreted as "socio-economic development in which the process of integrating political, economic and social activities takes place, while maintaining natural balance and the durability of basic natural processes, in order to guarantee the possibility of satisfying the basic needs of individual communities. or citizens of both the present and future generations" (Dz.U. – Journal of Laws of 2020, item 1219 as amended, art. 3 sec. 50, own translation).

3. THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

In order to increase the effectiveness of the actions taken in terms of the actual implementation of the concept of sustainable development, at the summit in New York in September 2015, the leaders of the UN member states, in the document entitled "Transforming our world: Agenda for Sustainable Development - 2030", adopted 17 Sustainable Development Goals Development as signposts for the development of the civilized world in the future (Fig. 1) (https://kampania17celow.pl/raporty/sdgs-w-praktyce-przewodnik-dla-firm-cz-1/, [access: 15.07.2021].

Figure 1: Sustainable development goals

Source: https://pl.wikipedia.org/wiki/Cele_Zr%C3%B3wnowa%C5%BConego_Rozwoju_2030#/media/Plik:Sustainable_Development_Goals.jpg [access of the day 12.07.2021]

The assumed goals have a global dimension, and their implementation is an ambitious commitment, which is assessed through monitoring based on the adopted indicators (SDG global indicator framework), on the basis of which the progress in their implementation will be verified. SDGs constitute the world development strategy until 2030 adopted by the UN member states, numerous institutions and organizations, including business, whose role in the process of achieving goals is crucial. The basic seventeen Sustainable Development Goals are defined in 169 tasks. The distinguished goals of sustainable development intertwine with each other, which means their interdependence in terms of economic, social and environmental processes. As a result of linking the Sustainable Development Goals and detailed tasks, five basic areas have been distinguished, i.e. people, planets, prosperity, peace and partnership, in which activities related to the implementation of sustainable development assumptions have been defined (Table 1).

Table 1: Activities identified in the field of SDGs

FIELDS	BASIC ACTIVITIES TO ACHIEVE THE SUSTAINABLE DEVELOPMENT GOALS
People	Striving for: • elimination of poverty and hunger • improving the health of societies • providing education opportunities for all • ensuring respect for human dignity and equality • improvement of the quality of the environment
Environment	Protection through: • sustainable production and consumption • sustainable management of natural resources • taking actions to counteract climate change • supporting the needs of modern and future generations • sustainable development of cities and agglomerations • measures to prevent deterioration of the environment
Prosperity	Achievement through: • ensuring a decent life for all people • guaranteeing economic, social and technological development by limiting the disturbance of the ecosystem
World peace	Striving for: • coexistence and cooperation of societies in conditions of peace and freedom on a global scale • shaping a social attitude based on awareness and the need for lasting peace and sustainable development
Partnership	Striving for: • commitment of the necessary resources for the implementation and implementation of the Sustainable Development Goals in the spirit of global solidarity and partnership in the field of sustainable development • building awareness and undertaking partnership cooperation activities of all countries and societies of the world, aimed at the needs of the poor and excluded social groups

Source: Own study based on https://kampania17celow.pl/raporty/sdgs-w-praktyce-przewodnik-dla-firm-cz-1/ and https://www.socialenterprisebsr.net/2018/07/cele-zrownowazonego-rozwoju-sdgs/ [access of the day 12.07.2021]

The specified Sustainable Development Goals are an obligation in the international, regional and national dimension, taking into account the long-term perspective as well as intergenerational integration.

The implementation of tasks in the field of the set sustainable development goals is a way of bringing people closer to solving economic, social and environmental problems. The actual and effective implementation of the sustainable development goals in practice can be achieved as a result of the implementation of projects. Indication of priority policies in the global and national dimension in the field of implementation of the idea of sustainable development and support for the achievement of goals and tasks by institutions and international programs, eg the European Union, enables efficient undertaking of actions in the form of projects by public organizations and enterprises (Kozien, Kozien, 2018a). Projects as unique and temporary risk-bearing activities enable optimization of activities in the institutional and financial dimensions (Kozień, 2018). The implementation of complex challenges in the field of sustainable development through projects enables the consolidation of stakeholders and resources.

4. IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT CONCEPT THROUGH PROJECTS - THE EMPIRICAL APPROACH

The formulated research objective concerning the analysis and evaluation of activities undertaken in the form of projects in the field of sustainable development in three areas concerning: environmental protection, social development and economic development, based on the example of the Głogów commune, allowed to define the following stages of the research methodology:

1) Defining the purpose and subject of the study.
2) Gathering information.
3) Assessment of the implementation of sustainable development in the area of environmental protection, social development and economic development through projects - qualitative and quantitative analysis.

The subject of the evaluation of the implementation in practice of the idea of sustainable development in three areas: environmental protection, social development and economic development was the Głogów commune, which territorially belongs to the Dolnośląskie Voivodeship. Information on projects that fit into the implementation of the idea of sustainable development was obtained on the basis of available documents and reports of the commune. To evaluate the implementation of the idea of sustainable development in the Głogów commune, the projects implemented since 2004, i.e. Poland's accession to the European Union by 2020, closing three programming periods: 2004-2006, 2007-2013, 2014-2020, were taken into account. The specified time of analysis and evaluation of completed projects in terms of the implementation of the idea of sustainable development also allowed for the assessment of the structure of their financing. The projects were subject to qualitative and quantitative assessment in terms of the formulated research goal. The preliminary analysis of the projects implemented in the commune in the years 2004-2020 consisted in selecting only those projects that relate to the three distinguished programming periods and the corresponding three fundamental areas of sustainable development (Table 2), then the structure of project financing for the three areas distinguished is summarized (Table 3). Examples of projects implemented in the Głogów commune in the analyzed period in the field of environmental protection concerned the arrangement of water and sewage management, closure and reclamation of municipal waste landfills, protection and access to the Odra river areas, in the area of social development were related to the development and dissemination of active integration as an opportunity to improve conditions employment of the inhabitants of the Głogów commune, seizing the opportunity - invest in yourself, establishing the Center for Vocational Counseling and Supporting People with Intellectual Disability, while in the field of economic development, projects concerned the preparation of investment areas, improvement of energy efficiency.

Table 2: Number of projects in the field of environmental protection, social development, economic development implemented in the Głogów commune in the three programming periods and total

PERIOD	ENVIRONMENTAL PROTECTION	SOCIAL DEVELOPMENT	ECONOMIC DEVELOPMENT
2004-2006	1	4	1
2007-2013	3	42	3
2014-2020	5	41	10
2004-2020	**9**	**87**	**14**

Source: Own study

Table 3: Financing structure of projects in the field of environmental protection, social development, economic development implemented in the Głogów commune in the years 2004 - 2020 (in PLN)

FIELD	TOTAL PROJECT COST	CO-FINANCING FROM THE EU FUNDS	OWN FINANCIAL CONTRIBUTION
Environmental protection	58 362.103,68	34 704 212,42	23 657 891,26
Social development	256 483 407,61	164 456 107,92	92 027 299,69
Economic development	46 323 427,37	26 898 376,59	19 425 050,78
Total	**361 168 938,66**	**226 058 696,93**	**135 110 241,73**

Source: Own study

A total of 110 projects were implemented in the Głogów commune in the years 2004-2020 in the field of environmental protection, social development and economic development. After Poland's accession to the European Union in 2004-2006, i.e. the first programming period in the Głogowski poviat, one project related to environmental protection, four related to social development, one related to social innovations in the strict sense, which was important for supporting sustainable economic growth and creating safe places work, as well as increasing competitiveness and has been classified in the area of economic development. In the years 2007-2013, three projects were carried out in the field of environmental protection measures, forty-two projects related to the area of social development and three related to economic development. In the last assessed period from 2014-2020, five projects related to environmental protection, forty-one projects related to investment in human development and ten projects contributing to development and economic growth were carried out. Analyzing the quantitative data presented in Table 2, it is possible to notice an upward trend in the number of projects implemented in the Głogów commune, especially the abrupt increase in the actions taken in the social area. In the commune, the most, i.e. 87 out of 110 analyzed projects, concerned investments in activities related to social development, while 14 projects related to entrepreneurial and innovative activities concerned economic undertakings, and only 9 projects in the analyzed period concerned environmental protection. On the other hand, the financing structure of implemented projects in the three analyzed areas in terms of sustainable development is presented in Table 3, which shows that the structure of the total cost of implemented projects is dominated by funds obtained from European Union funds. The largest share of EU funds was subsequently obtained to support social development, environmental protection and economic development.

5. CONCLUSIONS

In practice, based on the example of the commune of Głogów, it can be stated that the concept of sustainable development is being implemented, but in terms of three basic pillars: environmental protection, social development and economic development, there is a lack of balance in the actions taken, especially in the field of environmental protection. It should be emphasized that in the years 2004-2020 the commune effectively used funds from the European Union funds to implement projects closely related to sustainable development. Co-financing of projects from EU funds had a positive impact on the dynamics of sustainable development of the commune and the equalization of development opportunities in the area of environmental protection, social development, and economic development. It should be emphasized that the acquisition of funds from the European Union by the commune made it possible, in selected years of the analyzed period, to implement a portfolio of projects in the three areas of sustainable development. The structure of the implemented projects included both hard projects of an investment nature, as well as soft projects aimed at investing in human knowledge and skills, which prevailed. It is worth emphasizing that the commune of Głogów has so far successfully implemented the idea of sustainable development and has a vision for its implementation in the future, in accordance with the formulated principle stating that "the right to development must be fulfilled so as to fairly combine the development and environmental needs of the present and future generations" (Kozłowski, 2005). Sustainable development is a forward-looking and developmental concept, just like the projects themselves, which are unique activities always moving forward

LITERATURE:

1. Adamczyk, J., Nitkiewicz, T. (2007). *Programowanie zrównoważonego rozwoju przedsiębiorstw*. Warszawa: PWE.
2. Brundtland Report (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Oxford, UK,: Oxford University Press, https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf, [access: 15.07.2021].
3. von Carlowitz H.C. (1713). *Sylvicultura Oeconomica, Oder Haußwirthliche Nachricht und Naturmäßige Anweisung Zur Wilden Baum-Zucht*. Leipzig: Braun.
4. Carson, R. (2002). *Silent Spring*. Boston, USA: Mariner Books:.
5. Dobosz, P. (2015). *Sprawiedliwość międzypokoleniowa w prawie administracyjnym*. [in:] Stahl, M., Kasiński, M., Wlaźlak, K. (Eds.). *Sprawiedliwość i zaufanie do władz publicznych w prawie administracyjnym*. Warszawa: Lex a Wolters Kluwer business.
6. Dovers, S.R., Handmer, J.W., *Contradictions in Sustainability*. „Environmental Conservation", Vol. 20, No. 3/1993.
7. Fiedor, B. (1990). *Teoretyczne podstawy badania trwałości wzrostu gospodarczego*. [in:] Poskrobko, B. (Ed.). *Sterowanie ekorozwojem. Materiały konferencyjne, t.I*. Białystok: Politechnika Białostocka.
8. Florczak, W. (2011). *W kierunku endogenicznego i zrównoważonego rozwoju – perspektywa makroekonomiczna*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego.
9. Hull, Z. (2011). *Wprowadzenie do filozofii zrównoważonego rozwoju*. [in:] Tyburski, W. (Ed.). *Zasady kształtowania postaw sprzyjających wdrażaniu zrównoważonego rozwoju*. Toruń: Wydawnictwo UMK.
10. Kasprzak, K., Raszka, B. (2008). *Kobiety dla idei zrównoważonego rozwoju*. „Zeszyty Naukowe Południowo – Wschodniego Oddziału Polskiego Towarzystwa Inżynierii Ekologicznej z siedzibą w Rzeszowie i Polskiego Towarzystwa Gleboznawczego Oddział w Rzeszowie", nr 10.

11. Kielin-Maziarz, J. (2013). *Koncepcja zrównoważonego rozwoju w prawie Unii Europejskiej*. Lublin: Wydawnictwo KUL.
12. Kozien, E., Kozien, A. (2018a). *Legal and economic mechanisms of institutional support of implementation of European projects in view of the European Union law*. [in:] Cingula, M., Rhein, D., Machrafi, M. (2018). *Economic and Social Development (Book of Proceedings), 31st International Scientific Conference on Economic and Social Development*. Varazdin: Varazdin Development and Entrepreneurship Agency.
13. Kozien, E., Kozien, A. (2018b). *The sustainability development concept under the regulations in force of the Treaty on European Union and the Treaty on the Functioning of the European Union – legal and economical view*. [in:] Ribeiro, H., Naletina, D., da Silva, A.L. (Eds.). *Economic and Social Development (Book of Proceedings), 35th International Scientific Conference on Economic and Social Development – „Sustainability from an Economic and Social Perspective"*. Varazdin: Varazdin Development and Entrepreneurship Agency.
14. Kozień, E., Kozień, A. (2019). *Efficiency of the Principle of Sustainable Development in the European Union Law*. [in:] Ulewicz R., Hadzima B. (Eds.), *Quality Production Improvement - QPI 2019*, Warszawa: Walter de Gruyter (Sciendo).
15. Kozień, E., (1999). *Przedsiębiorczość w rozwoju przedsiębiorstw*. [in:] Targalski, J. (Ed.). *Przedsiębiorczość a lokalny i regionalny rozwój gospodarczy : materiały konferencji naukowej zorganizowanej przez Katedrę Przedsiębiorczości i Innowacji Akademii Ekonomicznej w Krakowie oraz Social Research Center Northumbria w Newcastle (Kraków, 14-15 IX 1999 r.)*. Kraków : Wydawnictwo AE.
16. Kozień, E. (2018), *Using the risk-list method for risk assesssment in the project*. [in:] Cingula, M., Rhein, D., Machrafi, M. (Eds.). *Economic and Social Development (Book of Proceedings), 31st International Scientific Conference on Economic and Social Development*. Varazdin: Varazdin Development and Entrepreneurship Agency.
17. Kozień, A. (2021). *The Principle of Sustainable Development as the Basis for Weighing the Public Interest and Individual Interest in the Scope of the Cultural Heritage Protection Law in the European Union*. „Sustainability", 13(7), 3985.
18. Kozłowski, S. (2005). *Przyszłość ekorozwoju*. Lublin: Wydawnictwo KUL.
19. Matysiak, A., Struś, M. (2015). *Paradygmat zrównoważonego rozwoju*. „Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach", no. 213.
20. Nowicki, M. (2007). *Lokalne bieguny wzrostu*. „Pomorski Przegląd Gospodarczy", no. 4
21. Pearce, D., Turner, R.K. (1990). *Economics of Natural Resources and Environment*. New York: Aldershot/Brookfield.
22. Piontek, B. (2010). *Współczesne uwarunkowania rozwoju społeczno-gospodarczego (ujęcie systematyczne)*. „Problemy Ekorozwoju", no. 2.
23. Rogall, H. (2010). *Ekonomia zrównoważonego rozwoju. Teoria i praktyka*. Poznań: Wydawnictwo Zysk i S-ka.
24. Rutkowska-Podołowska, M., Pakulska, J. (2011). *Wpływ idei rozwoju zrównoważonego na finanse firm*. „Zeszyty Naukowe Uniwersytetu Szczecińskiego, Finanse, Rynki Finansowe, Ubezpieczenia", no. 38.
25. Sommerville, M. (1862). *Psyhical Geography,* London, UK: John Murray.
26. Act of 27 April 2001 – Environmental law, Dz.U. – Journal of Laws of 2020, item 1219 as amended.
27. https://kampania17celow.pl/raporty/sdgs-w-praktyce-przewodnik-dla-firm-cz-1/, [access: 15.07.2021].
28. https://www.socialenterprisebsr.net/2018/07/cele-zrownowazonego-rozwoju-sdgs/, [access: 15.07.2021].

THE ECONOMIC CONSEQUENCES OF THE CRISIS AND ITS SOCIAL EFFECTS ON MINORITIES: THE CASE OF THE EAPN STRATEGY IN PORTUGAL

Ana Leite
Porto City Council, Portugal, Portugal
anamigueleite@gmail.com

Eduardo Manuel de Almeida Leite
CiTUR; ESTG, University of Madeira, Funchal, Portugal
eduardo.leite@staff.uma.pt

Humberto Nuno Rito Ribeiro
GOVCOPP; ESTGA, University of Aveiro, Portugal
hnr@ua.pt

Sandra Raquel Alves
CEOS.PP; ESTG, Polytechnic Institute of Leiria, Portugal
raquel.alves@ipleiria.pt

Amelia Ferreira da Silva
CEOS.PP; Porto Accounting and Business School, Porto Polytechnic, Portugal
acfs@iscap.ipp.pt

ABSTRACT

The change from the Welfare State to the Regulatory and Warranty State, or Gewährleistung, influences the ways of fighting poverty. Without diminishing national specificities, namely at the constitutional level, several states have been reducing their influence while providing social services due to the lack of resources, gradually abandoning their responsibilities and allowing non-governmental institutions to provide assistance on their behalf. Alternatively, joint responses are also being designed in a partnership way, by the means of new relationships between public, private and state agents. This paper addresses the economic impact of the pandemic crisis on poverty and social exclusion in Portugal, through the analysis of the European Anti-Poverty Network (EAPN). Given that poverty and social exclusion are at alarming levels in the European Union, with Portugal being one of the countries at greatest risk, it is important to be aware of this rising phenomenon, realizing what is being done on the ground to tackle it. Despite the existence of a European common network to fight poverty and social exclusion, i.e. EAPN, it is important to contribute to knowledge and understand the reasons why Portugal has such a high rate of people living in poor households, or at risk of poverty and social exclusion, when compared to other European Union member states. The results of the research developed for this paper indicate that the economic consequences of the pandemic crisis on poverty and social exclusion in Portugal are more evident in certain specific groups, such as ethnic minorities, as it is the case of Romani people and migrants.

Keywords: *Economic Crisis, EAPN, Social Exclusion, Poverty, Minorities, Portugal, European Union*

1. INTRODUCTION

The "Europe 2020" goal of reducing poverty by at least 20 million people, has not yet been achieved. In effect, the level of workers experiencing poverty continues to increase (9.6%). This means that the European Union's efforts are being insufficient or, eventually, are being

misdirected. European Anti-Poverty Network (EAPN)'s role in the European political scope has been to draw attention to the social objectives of "Europe 2020" so that they are given more relevance in terms of their progression and not just by noting the number. EAPN argues that greater importance is always given to competitiveness, convergence, and profitability (EAPN, 2018). As mentioned above, the European Union issues political and social guidelines in this matter, but the application of measures is, under Article 5 of the Treaty on European Union, the exclusive competence of the member states, with significant asymmetries between them. For example, Portugal and Germany are part of the same European Union statistic, since the definition of the percentage of people at risk of poverty or social exclusion is done by calculating a weighted average of national results. However, this formula masks considerable variations between EU member states. It is these variations between Portugal and Germany, between a southern European country, with a weak economy, recently intervened by the International Monetary Fund, and one of the strongest, if not the strongest, economies in the European Union, Germany, that motivate to understand why Portugal is deviating from European convergence in terms of poverty. In response to the crisis, austerity policies were adopted in the country, which highlighted the difficulties of families' survival and witnessing a unique growth in personal insolvencies, resulting in job and home losses. It is in this context of growing poverty and social exclusion, in which Portugal is one of the most affected countries, that the relevance of the study of poverty and social exclusion and the choice of case is justified.

2. THE ECONOMIC PROBLEMS AND CHALLENGES OF POVERTY AND SOCIAL EXCLUSION

The change from the Welfare State to the Regulatory and Warranty State (*Gewährleistungs*) influences the ways of combating poverty. Without prejudice to national specificities, namely at the national constitutional level (there are a set of constitutional limits to the idea of a Warranty State as, for example, in matters of health), the State has been reducing its influence in the provision of social services due to the lack of resources, giving up the provision and allowing non-governmental institutions to provide the service. Or, alternatively, joint responses are formed in a partnership relationship between public, private and state agents (Loureiro, 2010, 203). It is important to recall that the Article 5 (1; 2) of the Treaty on European Union (European Union, 2012, 5) states that "The limits of Union competences are governed by the principle of conferral. The use of Union competences is governed by the principles of subsidiarity and proportionality. Under the principle of conferral, the Union shall act only within the limits of the competences conferred upon it by the Member States in the Treaties to attain the objectives set out therein. Competences not conferred upon the Union in the Treaties remain with the Member States". Although there is a European tradition of letting third sector companies provide these services, there are still differences in social policies in the different member states of the European Union. There are different approaches because the European Union cannot formally impose these policies on its members, not least because poverty and social exclusion are found in different areas of its policy, namely: economic competitiveness and cohesion. In itself, the fact that there are different approaches constitutes an obstacle in the fight against poverty, since it is difficult to suggest measures that can improve the indicators of all the member states since they have such different portraits of poverty. This is pointed out as one of the reasons why the "Europe 2020" objective has not yet been reached, in fact, in 2015 the value was still above the value of 2008 in 1.6 million people (Darvas, 2017). Thus, according to Armstrong (2010), the Open Method of Coordination (OMC) is not a sufficient response to the cohesion of social policies in the different member states. Armstrong considers that this method only causes states to suffer influences from within and outside the state with regard to their social policies, but fails to harmonize and, consequently, present a solution.

Some of the main member states have reacted adversely to the Europe 2020 Strategy. In fact, Sweden, Germany and the United Kingdom did not allow supranational intervention by the European Union in the context of policies to combat poverty (Jessoula, 2015, 498-499). These countries argued that the poverty reduction target of this strategy could interfere with the distribution of social competences between the European Union and its member states. These three countries did not set poverty targets in line with those of the EU objective.

3. THE RESEARCH PROBLEM

The subject of study of this paper is poverty and social exclusion in the European Union, analyzed through the case of Portugal, given that it occupies a worrisome position at the edge of Europe. Despite the existence of a common network to fight poverty and social exclusion, EAPN, it is important to contribute to know and understand the reasons why Portugal has such a high rate of people living in poor households, or at risk of poverty and social exclusion when compared to other member states. The basic requirements to methodologically substantiate the conclusions of a research, according to Pizam (1994), are: i) objectivity, in order to guarantee an independent and impartial approach of the subject that carries out the research, in view of the answers to the questions that are the object of study. ii) reproduction of the results, the work must ensure that the procedures adopted by the researcher can be duplicated or reproduced in order to obtain the same results at the end. iii) systematization in the preparation of the investigation, insofar as each step is planned in order to highlight what will be necessary for the next phase. This systematization facilitates the organization of the research process in a sequence of interdependent and planned steps in advance. Studies usually start from the formulation of the research problem, which, according to Yin (2003), starts with the identification and selection of topics to be analyzed. In turn, these topics can be divided into two categories, namely (Pizam, 1994): topics of practical interest and topics of scientific interest. The former is particularly suitable for dealing with situations in which information is sought for decision making, or for determining the probable consequences of a particular action, in order to enable the choice of more appropriate alternatives. These can also be used to predict the future direction of certain events or phenomena, in order to plan a consonant action. The second, that is, topics of scientific or intellectual interest, cover a large number of study possibilities, from the concern with certain very concrete social problems, to the study of a theory.

Consequently, the study poses the following central research question:

- *What is the role of the European Anti-Poverty Network in combating poverty and social exclusion in Portugal?*

4. THE RESEARCH CASE DESIGN

In formulating the main question of this paper, "To what extent does the European Anti-Poverty Network contribute, in this context, to the fight against poverty and social exclusion?" it is indicated that this study will have a research with a descriptive structure, using an investigation strategy based on a case study. In fact, when intending to study a current event, through an exhaustive investigation, which allows to answer the present question, the case study appears as the most appropriate option. On the one hand, its use allows greater flexibility in data collection methods, while generating a natural delimitation of the object under analysis (Yin, 2003). However, it also has some limitations of a scientific nature, due to the risk of subjectivity incurred by the researcher in the evaluation of the event under analysis, and the reduced generalization that may be underlying its use (Pizam, 1994).

5. SOCIAL AND ECONOMIC ISSUES AND FINDINGS OF EAPN ROLE IN PORTUGAL

According to INE data, in 2018, about 2.2 million people were at risk of poverty or social exclusion in Portugal, corresponding in percentage to about 21.6%. Likewise, around 7.2% of the Portuguese population, lived in households with very low labor intensity (INE, 2018). The concern with the unemployed is highlighted throughout the national territory and is confirmed by data from INE (2018, 2) since the risk of poverty increased for the unemployed and inactive population by "44.8% in 2016 to 45.7% in 2017". Foreigners, namely citizens of third countries, are another group in which the incidence of poverty and social exclusion is very high (44%). The Portuguese section of EAPN was founded on December 17th, 1991, with headquarters in Porto. Being an organization recognized as a National Solidarity Association, it obtained, in 1995, the status of Non-Governmental Development Organizations (NGDOs). After 28 years, EAPN Portugal integrates 19 district centers covering the entire national territory, namely: Aveiro, Beja, Braga, Bragança, Castelo, Branco, Coimbra, Évora, Faro, Guarda, Leiria, Lisbon, Autonomous Region of Madeira, Portalegre, Porto, Santarém, Setúbal, Viana do Castelo, Vila Real, Viseu. And, more recently, covering the Autonomous Region of Madeira. The purpose of EAPN is to combat poverty and social exclusion, through the development of research, projects, training, communication and information. Portugal is a part of the European network, through EAPN Portugal. EAPN Portugal is guided by the principles of subsidiarity and partnership, having started the process of territorializing in 1994. Since 2005, conditions have been created for the existence of a center for each district. EAPN is present in 19 Districts of Portugal. Intervention at the national social level through the preparation of opinions, such as: What is and what is not to fight against Poverty - Report of Recommendations of the Operational Program of Support to the Neediest People, following the National Meeting of Associates of EAPN Portugal, in 2017. The projects, or actions, developed by the centers are directed to internal staff, namely EAPN technicians and external groups. External groups are also characterized by technicians from State agencies with professional profiles related to social action, as well as for other strategic partners, such as the Church and other private social action institutions. At the external level, there are also actions aimed at target populations, minorities in particular, such as: the Romani community and refugees. In a way, we may be led to conclude that poverty and social exclusion have a profile of ethnicity and beliefs and are not focused on the majority of the population in Portugal. It is not a poverty related solely to income, but above all to ethnicity, beliefs or age. Specifying, with regard to the Romani community, we can point that poverty and social exclusion, come from constant mobility, not belonging to any particular city, then ending up being "unwanted" in the places where they pass through, consequently, being marginalized. According to Alexandra Castro (2015, 144), "the feeling of being an unwanted person in one's own country brings with it the experience of being an unwanted person, without a place". Alexandra Castro also mentions that frequently this minority does not have access to the social benefits provided by the local authorities, since they are not normally integrated in a city. Likewise, the importance of space as a factor of poverty and exclusion is highlighted by Madanipour (2011).

5.1. Refugees and Immigrants

In terms of findings for refugees and immigrants, refugees are the only ones mentioned in the Aveiro report, which even cooperates with the support platform for refugees, to "relocate them to the district" (EAPNa, 2016, 8). On the other hand, Braga reports the concern with immigrants who, alongside the Romani population, suffer from "increased difficulties in terms of socio-professional inclusion" (EAPNb, 2016, 6).

5.2. Romani population

The district centers that signal concerns with the Romani community are: Aveiro, Braga, Castelo Branco, Guarda, Portalegre and Évora. According to Bruto da Costa (2015, 11, op. cit. Diogo, 2015), "a case in which poverty overlaps social exclusion is that of the Romani population. It is one of the most complex and difficult to solve social problems, and it is experienced in several countries in Europe. I believe that the complexity results from, being the paradigmatic case of a "meeting" of cultures with strong identities, requiring wise flexibility and an openness to the "universal", on both sides. Neither of the two cultures in question (the Romani and the wider society) can be marked by immovable criteria. This would result, on the one hand, in exclusionary behavior, and, on the other, in an attitude of self-exclusion." Initiatives promoted by the centers for the Romani community include: talk "Integration of Romani people in the labor market" - testimony of a Romani and awareness raising campaign: child and maternal health in the Romani community (Castelo Branco, EAPNc, 2016), awareness session on the integration of Romani communities (Évora, EAPNd, 2016), an event on/for Romani communities (Guarda, EAPNe, 2016) and to build intervention strategies in the area of Romani communities (Portalegre, EAPNf, 2016).

6. CONCLUSION

In this paper, the phenomenon of poverty and social exclusion was studied, mainly, through the analysis of the EAPN Portugal case. From the analysis done, it can be concluded that the role of the European Anti-Poverty Network in combating poverty and social exclusion in Portugal, translates into actions to raise awareness among risk groups, and to train staff to deal with the issue at hand. As a matter of fact, this role of the EAPN is also limited by the small budgets they have, judging by the limited financial data available. Likewise, the predominance of risk groups in the Romani population and other minorities, confirms the relevance and the need of specific work to be developed and focused on these more fragile groups. The role of the European Anti-Poverty Network in combating poverty and social exclusion in Portugal is effective, but there is still much more to be done. The economic consequences of the pandemic crisis on poverty and social exclusion in Portugal are evident, particularly in certain specific groups, such as ethnic minorities, as it is the case of Romani people and migrants. More actions are therefore required in order to tackle the issue of the severe economic crisis on society, in particular on minorities.

ACKNOWLEDGEMENT: *This work was financially supported by the research unit on Governance, Competitiveness and Public Policy (UIDB/04058/2020) + (UIDP/04058/2020), funded by national funds through FCT - Fundação para a Ciência e a Tecnologia.*

LITERATURE:

1. Armstrong, K. (2010). Governing Social Inclusion. Europeanisation Through Policy Coordination. Oxford: Oxford University Press.
2. Castro, A. (2015). Quando a mobilidade espacial é geradora de vulnerabilidades: o caso dos portugueses ciganos in Pobreza e Exclusão Social em Portugal – Contextos, Transformações e Estudos.

3. Darvas, Z. (2017). Why is it so hard to reach the EU's 'poverty' target?. Policy Contribution, Issue nº 1, Bruegel, Brussels.
4. Diogo, F. Castro, A. e Perista, P. (Org.). (2015). Pobreza e Exclusão Social em Portugal: Contextos, Transformações e Estudos. 1ª Edição. Coleção Debater o Social. Edições Húmus, V. N. Famalicão.
5. EAPN Portugal (2016a). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Aveiro.
6. EAPN Portugal (2016b). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Braga.
7. EAPN Portugal (2016c). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Castelo Branco.
8. EAPN Portugal (2016d). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Évora.
9. EAPN Portugal (2016e). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Guarda.
10. EAPN Portugal (2016f). Plano de atividades 2016. EAPN Portugal: Núcleo Distrital de Portalegre.
11. EAPN Portugal (2018). Relatório Anual. EAPN Portugal.
12. European Union (2012). Consolidated Version of The Treaty on European Union. Official Journal of the European Union.
13. Instituto Nacional de Estatística. (2018). Rendimento e Condições de Vida 2018. Destaque. Serviço de Comunicação e Imagem.
14. Jessoula, M. (2015). Europe 2020 and the Fight against Poverty – Beyond Competence Clash, Towards 'Hybrid' Governance Solutions?. Social Policy & Administration. vol. 49, no. 4, 490–511. ISSN 0144–5596 DOI: 10.1111/spol.12144.
15. Loureiro, J. C. (2010). Adeus ao Estado Social? A Segurança Social entre o Crocodilo da Economia e a Medusa dos «Direitos Adquiridos». Coimbra. Coimbra Editora.
16. Madanipour, A. (2011). Social exclusion and space. Em: LeGates R and Stout F (eds) City Reader, 5ª edição. London: Routledge, 186–194.
17. Pizam, A. (1994). Planning a Tourism Research Investigation. In: Ritchie, J. R. and Goeldner, C. R. (eds.). Travel, Tourism, and Hospitality Research: A Handbook for Managers and Researchers. Chichester, John Wiley & Sons, 91-104.
18. Yin, R. K. (2003). Case Study Research: Design and Methods, 3ª Edição, Sage Publications Inc, London.
19. Yin, R. K. (2005). Estudo de Caso. Planejamento e Métodos. Porto Alegre: Bookman.

THE EVALUATION OF TAXPAYERS' BEHAVIOR: LITERATURE ANALYSIS

Agne Jakubauskaite
Vilnius University, Faculty of Economics and Business Administration,
Sauletekio av. 9, (II building), room 415, Vilnius, Lithuania
agnes.jakubauskaites@gmail.com

ABSTRACT

The purpose of this study was to select relevant scientific articles on Taxpayers' behavior topic from the Clarivate Web of Science Core Collection database. The selection was based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method. From 645 records, after all steps of PRISMA method, 83 articles left for deeper analysis. Although the majority of articles belong to Economics or Business categories, a quarter was selected from other research areas (for example, "Psychology", "Government and Law" and "Public Administration"). From 2015-2016 there was a growing interest in the topic of Taxpayers' behavior. In selected articles there were assessed areas of research, variables that determine taxpayers' decisions to (not)comply, and some actions of tax administrations. This analysis could be used to further select the most appropriate methods and variables for a practical assessment of a given country's taxpayers' compliance behavior.

Keywords: *PRISMA, Tax compliance, Taxpayers' behavior*

1. INTRODUCTION

The taxation topic is very important around the world. Revenue from taxes in most of countries are the main source of budget revenues. Government seeks to establish tax system, which meets the main principles of taxation (fairness, convenience, certainty and efficiency) and at the same time to ensure the maximum possible income to the budget. Taxes for states are a powerful fiscal policy instrument and let to implement its functions, to provide public services. At the same time, for taxpayers taxes are an obligation, which reduces their resources. In order to ensure the collection of tax revenue, for tax administrations and governments it is important to get to know the taxpayers and their motives to fulfill or not their tax obligations. For economic researchers this topic is relevant also for its complexity. For data collection researchers choose various sources: naturally occurring field data (including administrative data), experiments (both controlled field and laboratory) or social surveys. Also, the tax topic goes beyond the economics subject and is being examined from sociology or psychology perspectives. The paper is structured as follows: Section 2 provides an explanation about the scientific articles selection process, using the PRISMA method. Section 3 provides the analysis of selected articles and is divided into four sub-sections. Firstly, the main recordes indicators (research areas, publishing years, publishers and keywords) are analyzed. Secondly, in the second, third and fourth sub-sections the main research areas, the main data sources and collection methods, the main variables are analysed and some more detailed examples are provided. Finally, Section 4 provides conclusions.

2. METHODOLOGY

The scientific articles research is based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method (Moher et al., 2009) (Figure 1). This method was used to select scientific articles and analyse different aspects of taxpayers' behavior topic: research areas, variables, data.

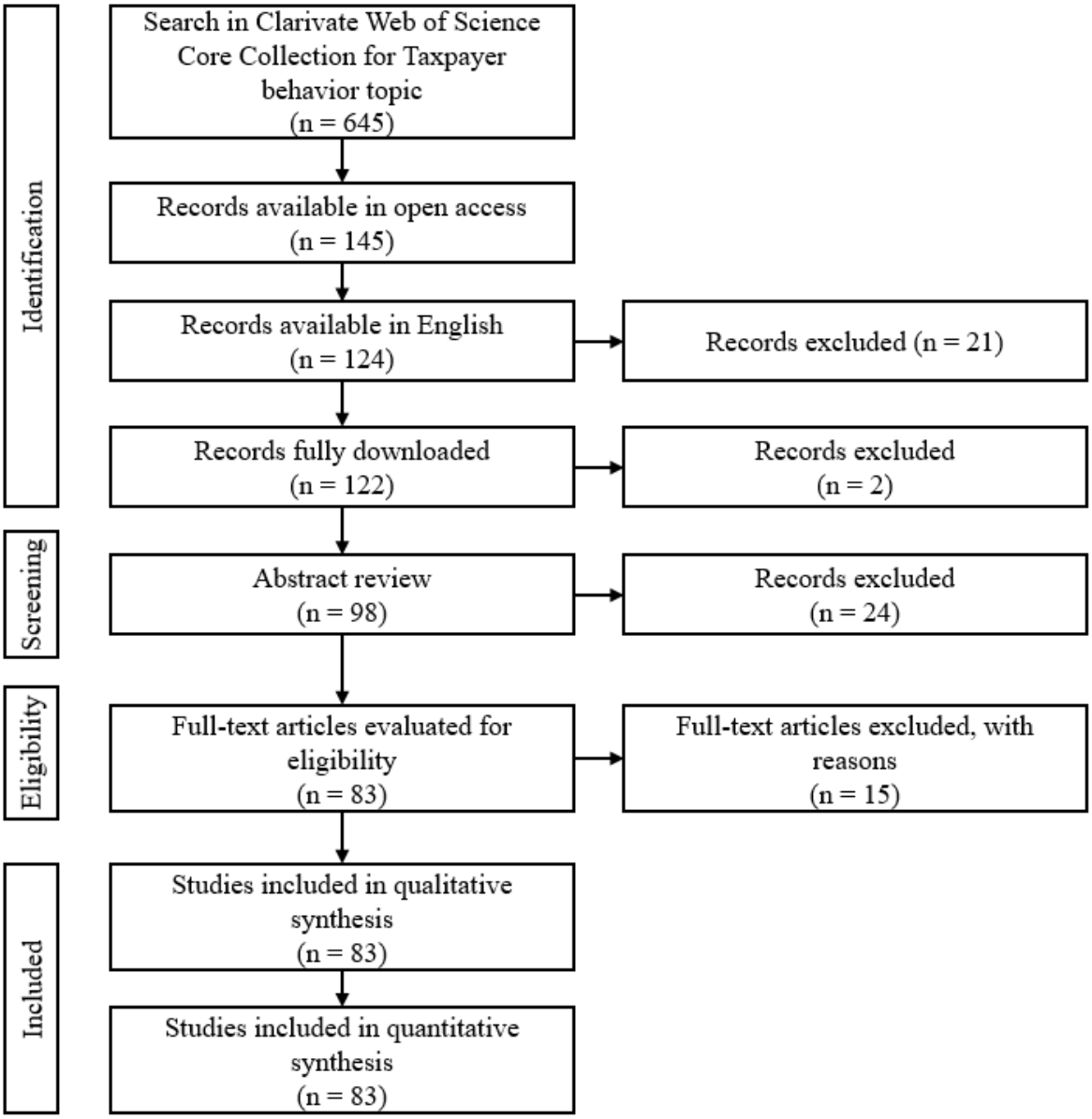


Figure 1: The selection articles using PRISMA method
(Source: composed by the author on the basis of Moher et al., 2009)

The analysis was based on scientific literature from the Clarivate Web of Science Core Collection database. The selection of the publications was made by several steps. Firstly, the original query "Taxpayer behavior" returned 645 records (the last updated of query to get the newest records, was made on 18th of July, 2021). Secondly, open access possibility was checked and 145 records were available. Thirdly, the language filter was used and 124 publications in English were selected. Other filters, such as Web of Science Categories or Research Areas were not used due to potentiality of topic interdisciplinarity. This decision was confirmed after finishing the whole selection process (according to the Research Area indicator from 83 selected publications, 23 had different named areas than Economics or Business). After finishing downloading step, 122 articles abstracts were analysed to identify the publications relevant for further analysis. After that, 24 publications were excluded (mainly due to inapplicable topics (for example, there were some articles about medicine) or related more on analysis of tax revenues than taxpayers behavior impact).

The deeper analysis of 98 remaining articles allowed to select the most relevant publications. The main reasons for exclusion: legislative impact assessment, a narrowly defined specific tax is discussed and etc. The further analysis was carried out on the basis of 83 publications.

3. RESULTS OF ANALYSIS

3.1. The topic prevalence assessment

As it was mentioned in the previous section, 83 publications were selected for the main analysis. According to the Research Areas provided by Web of Science database as metadata of publications, the biggest part (54 percent) of selected articles was assigned to "Business and Economics" field (Table 1). Whereas, some articles were assigned to more than one Research Area, altogether, "Business and Economics" as Research Area was mentioned in 60 publications or 72 percent of all selected articles. In other words, 23 publications or 28 percent have a different Research Area. The most common are "Psychology", "Government and Law" and "Public Administration". This confirms that the topic of taxpayers' behavior is relevant not only in economics or business fields.

Research Areas	Count	Frequency
Business & Economics	45	54%
Business & Economics; Psychology	5	6%
Psychology	5	6%
Business & Economics; Social Sciences - Other Topics	4	5%
Government & Law	3	4%
Public Administration	3	4%
Computer Science	2	2%
Science & Technology - Other Topics	2	2%
Social Sciences - Other Topics	2	2%
Art	1	1%
Business & Economics; Education & Educational Research	1	1%
Business & Economics; Mathematical Methods In Social Sciences	1	1%
Business & Economics; Mathematical Methods In Social Sciences; Mathematics	1	1%
Business & Economics; Mathematics	1	1%
Business & Economics; Operations Research & Management Science	1	1%
Computer Science; Engineering; Operations Research & Management Science	1	1%
Criminology & Penology	1	1%
Development Studies; Business & Economics	1	1%
Psychology; Criminology & Penology	1	1%
Science & Technology - Other Topics; Environmental Sciences & Ecology	1	1%
Social Issues; Psychology	1	1%
Total	83	100%

Table 1: Decomposition of articles by Research Areas
(Source: composed by the author on the basis of the Full Record information from Web of Science database)

From time perspective, there is visible growth of popularity of Taxpayers' behavior topic since 2015-2016 and the maximum so far was reached in 2020 (Figure 2). Until 2013, just 7 selected articles were published.

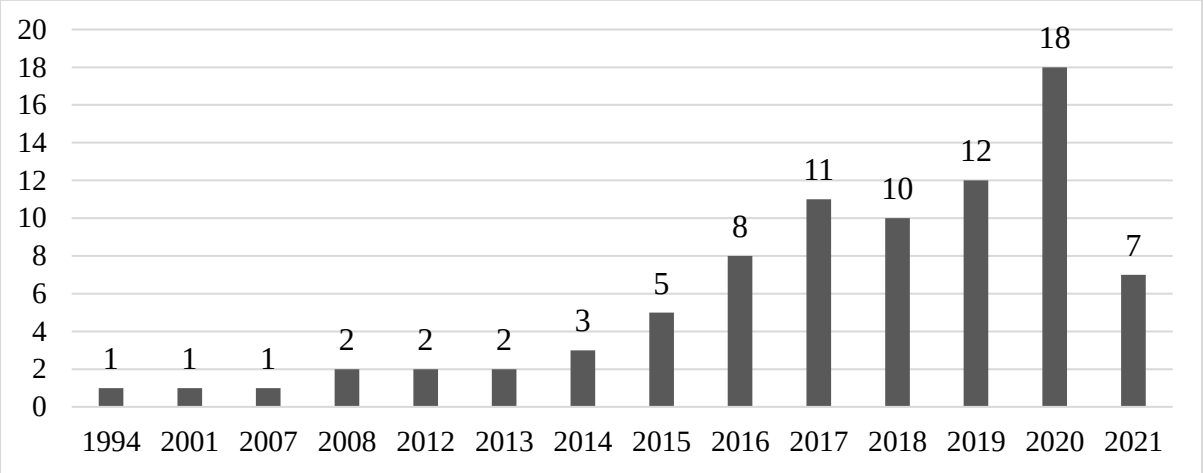


Figure 2: The distribution of selected articles by publishing years
(Source: composed by the author on the basis of the Full Record information from Web of Science database)

Dividing articles by the Publishers, about one third of selected publications was published by Elsevier and Springer groups (Table 2). Altogether, there were 36 unique publishers and 56 Journals (Journal of Economic Behavior & Organization – 6 publications, International Tax and Public Finance – 5 publications, Journal of Economic Psychology – 5 publications, Journal of Tax Reform – 5 publications).

Publisher	Count	Frequency
ELSEVIER	19	23%
SPRINGER	9	11%
URAL FEDERAL UNIV	5	6%
WILEY	5	6%
BABES-BOLYAI UNIV	3	4%
PENERBIT UNIV KEBANGSAAN MALAYSIA	3	4%
PERGAMON-ELSEVIER SCIENCE LTD	3	4%
SAGE PUBLICATIONS INC	3	4%
EMERALD GROUP PUBLISHING LTD	2	2%
MDPI	2	2%
OXFORD UNIV PRESS	2	2%
SCIENDO	2	2%
VILNIUS GEDIMINAS TECHNICAL UNIV PRESS	2	2%
Other Publishers (one article)	23	28%
Total	83	100%

Table 2: Decomposition of articles by Publishers
(Source: composed by the author on the basis of the Full Record information from Web of Science database)

Last, but not least variable in this part of analysis – the Author Keywords. 9 of selected articles did not have this information. Other 74 publications together had 368 keywords or 256 uniques ones (differed by at least one letter, excluding uppercase and lowercase letters). Two main keywords "tax compliance" and "tax evasion" were mentioned respectively in 31 and 24 articles. For a more accurate assessment some keywords were combined expertly to maintain a similar meaning (Table 3).

Keyword	Count	Keyword	Count	Keyword	Count
Compliance	**42**	**Evasion / avoidance**	**33**	**Behavior**	**23**
tax compliance	31	tax evasion	24	behavioral economics	4
compliance	4	tax avoidance	4	fiscal behavior	3
compliance behavior	1	evasion	2	tax behavior	2
compliance quality	1	determinants of tax evasion	1	tax behaviour	2
compliance strategy	1	income tax evasion	1	behavior	1
economic model of tax compliance	1	avoidance	1	behavioral model of tax compliance	1
tax compliance costs	1	**Taxpayer**	**11**	behavioral economy	1
tax compliance simplicity	1	taxpayer	4	behavioral insights	1
voluntary tax compliance	1	taxpayers	3	behavioral	1
		individual taxpayers	1	behaviour	1
		taxpayer's attitudes towards the government	1	non-compliance behaviour	1
		taxpayers perceptions	1	behavioural response	1
		trusted taxpayers	1	deduction behavior	1
				economic behavior	1
				behavioural economics	1
Others (219)	259			tax behavioral	1

Table 3: The main Keywords
(Source: composed by the author on the basis of the Full Record information from Web of Science database)

To sum up, the biggest part of selected articles belongs to "Business" or/and "Economics" Research Areas, but about one fourth is attributed to different fields of research. The main publishers of selected articles are Elsevier and Springer and the growth of Taxpayers' behavior topic is seen from 2015-2016. Among main keywords in selected articles are different phrases having compliance, evasion, behavior and taxpayer concepts.

3.2. The main research areas

Analyzing selected articles, the main directions of research have been singled out (Table 4).

Research area	Authors
The relationship between government and taxpayers	• Allif et al., 2021; • Aliev et al., 2021; • Bătrâncea & Nichita, 2015; • Damayanti et al., 2020; • Faizal, Palil, 2017; • Gangl et al., 2020; • Gobena & Van Dijke, 2017; • Molodykh & Rubezhnoy, 2017.
The relationship between tax auditors / tax authorities and taxpayers	• Gangl et al., 2019; • Gangl et al., 2015; • Muhammad, 2013; • Syuhada et al., 2021.
The connection between the intention to pay taxes and to make charitable donations	• Castiglioni et al., 2019; • Fack & Landais, 2016.
Interactions in a social network	• Hashimzade et al., 2014.
Taxpayers' segmentation	• Slemrod, 1994.

Table 4: Research areas
(Source: composed by the author on the basis of of indicated sources)

One of the important areas of research on taxpayers' behavior topic is the relationship between government and taxpayers. Allif et al., (2021) made a taxpayers' survey in East Malaysia to investigate what impact governance quality has on taxpayers' compliance behavior. They asked the respondents (N=78) to evaluate on a scale from 1 (strongly disagree) to 5 (strongly agree) different governance quality aspects (Voice and Accountability, Political Stability, Government Effectiveness, Rule of Law), which are related to tax compliance. The results showed that just the Rule of law and Political Stability had a significant positive effect on taxpayers' compliance behavior. According to this, it is crucially important to maintain a stable political system and create effective rule of law. Aliev et al., (2021) made a research with representatives of North Caucasus (Russia) small and medium businesses using the "slippery slope" concept. The results showed that tax compliance depends on the personal evaluation of justice of the current tax system and the level of trust in government authorities. In Malaysia the "slippery slope" concept was analysed making a survey with individual taxpayers (N=241) (Faizal, Palil, 2017). According to the results of this research, only trust has a significant impact on taxpayers' behavior, while power, regardless of its nature (legitimate or coercive), has no significant effect. A different research was made by Brezeanu et al. (2019). They took 12 European Union member states and formed two groups of countries (developed and developing or emerging), then created a model with 5 explanatory variables. The dependent variable was the dynamics of public debt and independent variables were: GDP dynamics, scale of payments (export-import) and indirect taxes, direct taxes and social contributions share of GDP. The results showed that in the developed countries group there was an increase in the share of indirect tax revenues and the evolution of public debt had a positive correlation. On the other hand, the development of direct tax revenues had the reducing effect for public debt. In the group of emerging economy countries, the increase in indirect tax revenues had a negative correlation with the evolution of public debt. Simultaneously, the growth of direct tax revenues had an increasing impact on public debt. The commonality between developed countries and developing countries groups observed in the study was income from social contributions, which contributes to the reduction of public debt.

3.3. The main data sources and collection methods

By evaluating selected articles, it is important to identify the main data sources and methods of collection (Table 5).

Table following on the next page

Data sources / Collection methods	Authors
Taxpayers' surveys	• Chong et al., 2019; • Diakomihalis, 2020; • Dobos & Takács-György, 2020; • E Hassan et al., 2021; • Enachescu et al., 2019; • Mahangila & Anderson, 2017; • Muhammad, 2017; • Murphy & Harris, 2007; • Saad, 2014; • Shafer et al., 2020.
Administrative / economic data analysis	• Alstadsæter et al., 2019; • Beer et al., 2020; • Todor et al., 2019.
Social experiments (field or laboratory)	• Aharoni et al., 2020; • Balconi et al., 2019; • Becchetti et al., 2017; • Choo et al., 2016; • Damayanti et al., 2020; • Gangl et al., 2020; • Górecki & Letki, 2020; • Holler et al., 2008; • Kettle et al., 2017; • Kireenko et al., 2018; • Mogollon et al., 2021; • Otsu et al., 2013; • Paetzold, 2019; • Pomeranz & Vila-Belda, 2019; • Yefimenko, 2016.
Letters	• Bott et al., 2019; • Castro & Scartascini, 2015; • Gillitzer & Sinning, 2020.
Analysis of public information	• Lozza & Castiglioni, 2018; • Onu & Oats, 2018.

Table 5: Data sources and methods of collection
(Source: composed by the author on the basis of of indicated sources)

A large-scale randomized field experiment was done in Norway, by sending letters for 15.000 taxpayers who probably incorrectly reported their foreign income (Bott et al., 2019). The results showed that moral suasion and a reprehensible probability of detection have essential influence for nudging taxpayers to comply. In terms of long-term effects the experiment showed that just detection has a durable influence. Another large field experiment was made in Argentina with property tax taxpayers (Castro & Scartascini, 2015). Compared with control group, taxpayers, who received a deterrence message (written the amount of the fine for the late payment) had about 5 percent points higher compliance probability. Other types of messages (Reciprocity (examples of tax use are identified) and Peer-effects (named the proportion of taxpayers who do not pay)) did not show average effects. However, there were some taxpayers in these two groups, whose the probability of compliance increased and some others, whose decreased. While analysis of administrative data (Beer et al., 2020), social surveys, field or laboratory experiments are widely used to determine and analyse taxpayers' behavior and their motives, some experiments with evaluation medical indicators were used to better understand taxpayers'

decisions. One of the examples of such research was made with thirty self-employed taxpayers (Balconi et al., 2019). The research gave realistic economic situations for participants to make decisions related to tax compliance. During the experiment participants autonomic (skin conductance and heart rate) and neural brain activities were recorded. The evaluation of physiological responses showed an increased indicator value in the parts of the experiment related to audits. This research provided additional evidence that the main assumption of the classical economics theories of tax behavior (taxpayers behavior is rational) could be supplemented with psychological and social-affective indicators.

3.4. The main variables

In the selected articles the influence of various variables is assessed. They could be divided into specific groups (Table 6).

Table following on the next page

Group of variables	Variables	Authors
Economical	Gross domestic product per capita, labor productivity and poverty	• Brezeanu et al., 2018;
	Income distribution	• Bertotti & Modanese, 2018; • Slemrod, 1994;
	Ability to pay	• Fjeldstad & Semboja, 2001;
	Wealth / size of income	• Gangl & Torgler, 2020; • López-Laborda et al., 2018; • Saad, 2012;
	Social status of taxpayer	• Stankevicius & Leonas, 2015.
Administrative	Audits / penalties / fines	• Advani, 2021; • Alm et al., 2020; • Beer et al., 2020; • Choo et al., 2016; • Dare, 2020; • Goumagias et al., 2018; • Hashimzade & Myles, 2017; • Hashimzade et al., 2016; • Kim & Lee, 2020; • Lopez-Luzuriaga & Scartascini, 2019; • Palil et al., 2016; • Yahyaoui & Tkiouat, 2018;
	Tax rate	• Adam et al., 2021; • Brezeanu et al., 2018;
	Trust in tax / state authorities	• Damayanti et al., 2015; • Brezeanu et al., 2018;
	Information campaigns organized by tax administrations	• Holler et al., 2008;
	Procedural justice	• Murphy et al., 2016.
Legal / Political	Changes in tax policy	• Bikas & Sakalauskas, 2020; • Sudavicius & Endrijaitis, 2020;
	Tax policy harmonization	• Borisovich et al., 2016; • Wołowiec, 2018;
	Complexity of the legislation	• Diakomihalis, 2020; • Palil et al., 2016;
	Knowledge of tax law / tax system	• Hofmann et al., 2008; • Koretskaya-Garmash, 2017; • Saad, 2014;
	Government policy	• Yefimenko, 2016;
	Knowledge how government spends tax revenue	• Kireenko et al., 2018; • Lesnik et al., 2014.
Sociological / Psychological	Norms	• Bătrâncea et al., 2012; • Górecki & Letki, 2020; • Hofmann et al., 2008;
	Emotions	• Enachescu et al., 2019;
	Social networks	• Gamannossi degl'Innocenti & Rablen, 2020;
	Shame	• Murphy & Harris, 2007;
	Classification as fair	• Suh et al., 2019.
Historical circumstances	Church and state role	• D'Attoma, 2017.
Demographic	Gender / age	• Advani, 2021; • Pomeranz & Vila-Belda, 2019; • Prasetyo at al., 2020;
	Gender, age, children, income	• Díaz Caro & Crespo Cebada, 2016.
Capability to manage tax regulation	Management experience; financial and tax knowledge; resource capacity; etc.	• Battisti & Deakins, 2018.

Table 6: Main variables analysed
(Source: composed by the author on the basis of of indicated sources)

In evaluation of taxpayers' decisions towards tax compliance process, many different variables could be analysed. For example, Organisation for Economic Co-operation and Development (OECD, 2010) defines six groups of variables, which have an impact for taxpayers' behavior: a) deterrence; b) norms; c) opportunities; d) fairness; e) economic factors; f) interactions. Batrancea et al., 2012 higlighted that despite of standard tax evasion models, describing relevant determinants of tax compliance, such as tax rate, audit probability, penalty amount, it is important to evaluate sociological and psychological aspects, such as norms, motivations, perceptions and etc. According to the authors, for tax administrations and governments it is important to evaluate different factors of taxpayers' behavior in order to have strong substantiation for fiscal policy implementation. Many researchers mention the probability of tax audits as one of the most important factors for taxpayers' decisions. However, past audits could have an impact for future decisions. Beer et al., 2020, analyzed 7500 self-employed United States taxpayers administrative data and operational audit information to evaluate the operational tax audits impact for future tax compliance. They found that audits could have a significant deterrent effect, subject to the audit results. It was estimated that after one year aggregate taxable income of taxpayers, who were audited, increased about 15 percent. In addition, they compared taxpayers' who received an additional tax assessment after an audit and those who did not get it. In the first year after the audit, taxpayers who received additional tax assessment declared 64 percent higher income and those without additional tax assessment declared 15 percent lower taxable income than it would have been without the audit. Authors believe, that effectively targeted audits could not only increase tax revenues at present, but could be a good investment for the future. Some macroeconomic indicators could be also important to taxpayers compliance behavior. Brezeanu et al., (2018) built an econometric model of multifactorial regression to evaluate different factors: tax rate, gross domestic product per capita, confidence in state authorities, labor productivity and poverty. The results showed that there is a negative correlation between taxpayers' behavior and poverty, labor productivity and confidence in the state authorities. The positive correlation was identified between taxpayers' behavior and gross domestic product per capita. Some interesting variables were examined trying to answer why there is differences in the level of tax compliance in the South and in the North of Italy (D'Attoma, 2017). The author choose to evaluate the historical circumstances effect to tax compliance, by using main formal institutions (the church, state, political parties) and informal institutions (clientelism). According to this study, higher tax compliance level in North Italy could be caused by historical events in nineteenth century when in North Italy increased state role and public institutions, while in South Italy the Catholic Church had the main power and private interests were favored.

4. CONCLUSION

Taxpayers' behavior topic is very important from both practical and theoretical perspective. This topic goes beyond economics or business and is examined using theories and methods of psychology, sociology and public administration science. The main data for taxpayers' behavior analysis are administrative and collected during field or laboratory experiments, taxpayers and tax administrators surveys. The key variables in assessment of taxpayers compliance behavior belong to different areas: economical, administrative, legal, psychological, demographic, and etc. In order to ensure the collection of the budget it is important to find out the main motives of taxpayers' decisions and to find best nudging strategies.

LITERATURE:

1. Adam, S., Browne, J., Phillips, D., & Roantree, B. (2021). Frictions and taxpayer responses: evidence from bunching at personal tax thresholds. *International Tax and Public Finance*, *28*(3), 612–653. https://doi.org/10.1007/s10797-020-09619-0

2. Advani, A. (2021). Who does and doesn't pay taxes? *Fiscal Studies*, 1–18. https://doi.org/10.1111/1475-5890.12257
3. Aharoni, E., Kleider-Offutt, H. M., Brosnan, S. F., & Fernandes, S. (2020). Slippery scales: Cost prompts, but not benefit prompts, modulate sentencing recommendations in laypeople. *PLoS ONE*, *15*(7 July), 1–17. https://doi.org/10.1371/journal.pone.0236764
4. Aliev, M., Milovanova, E., Moiseenko, I., & Molodykh, V. (2021). Compliance with Tax Laws in the Russian Federation: Trust or Control. *TEM Journal*, *10*(1), 310–317. https://doi.org/10.18421/TEM101-39
5. Allif, M., Abu, A., Palil, M. R., & Maelah, R. (2021). Governance Quality and Tax Compliance Behaviour in East Malaysia. *Asian Journal of Accounting and Governance*, *15*, 1–14. https://doi.org/10.17576/ajag-2021-15-07
6. Alm, J., Cox, J. C., & Sadiraj, V. (2020). Audit State Dependent Taxpayer Compliance: Theory and Evidence From Colombia. *Economic Inquiry*, *58*(2), 819–833. https://doi.org/10.1111/ecin.12864
7. Alstadsæter, A., Kopczuk, W., & Telle, K. (2019). Social networks and tax avoidance: evidence from a well-defined Norwegian tax shelter. *International Tax and Public Finance*, *26*(6), 1291–1328. https://doi.org/10.1007/s10797-019-09568-3
8. Balconi, M., Crivelli, D., Castiglioni, C., & Lozza, E. (2019). Social frame and tax compliance modulate electrophysiological and autonomic responses following tax-related decisions. *Scientific Reports*, *9*(1), 1–8. https://doi.org/10.1038/s41598-019-41156-7
9. Bătrâncea, L. M., Nichita, R. A., Bătrâncea, I., & Moldovan, B. A. (2012). Tax compliance models: From economic to behavioral approaches. *Transylvanian Review of Administrative Sciences*, *36*, 13–26.
10. Bătrâncea, L., & Nichita, A. (2015). Which is the best government? Colligating tax compliance and citizens' insights regarding authorities' actions. *Transylvanian Review of Administrative Sciences*, *44*, 5–22.
11. Battisti, M., & Deakins, D. (2018). Microfoundations of Small Business Tax Behaviour: A Capability Perspective. *British Journal of Management*, *29*(3), 497–513. https://doi.org/10.1111/1467-8551.12244
12. Becchetti, L., Pelligra, V., & Reggiani, T. (2017). Information, belief elicitation and threshold effects in the 5X1000 tax scheme: a framed field experiment. *International Tax and Public Finance*, *24*(6), 1026–1049. https://doi.org/10.1007/s10797-017-9474-z
13. Beer, S., Kasper, M., Kirchler, E., & Erard, B. (2020). Do Audits Deter or Provoke Future Tax Noncompliance? Evidence on Self-Employed Taxpayers. *CESifo Economic Studies*, *66*(3), 248–264. https://doi.org/10.1093/cesifo/ifz018
14. Bertotti, M. L., & Modanese, G. (2018). Mathematical models describing the effects of different tax evasion behaviors. *Journal of Economic Interaction and Coordination*, *13*(2), 351–363. https://doi.org/10.1007/s11403-016-0185-9
15. Bikas, E., & Sakalauskas, R. (2020). Taxpayer'S Behavior in the Changing Tax Policy. *International Journal of Economic Sciences*, *IX*(2), 23–38. https://doi.org/10.20472/es.2020.9.2.002
16. Borisovich, M., Ivanovich, T., Anatolyevich, M., Valentinovich, R., & Pavlovich, G. (2016). Tax Instruments To Counteract the Economic Activity in the Shadow Economy. *Turkish Online Journal of Design Art and Communication*, *6*(November), 2586–2594.
17. Bott, K. M., Cappelen, A. W., Sørensen, E. O., & Tungodden, B. (2019). You ve got mail: A randomized field experiment on tax evasion. *Management Science*, *66*(7), 2801–2819. https://doi.org/10.1287/mnsc.2019.3390
18. Brezeanu, P., Dumiter, F., Ghiur, R., & Todor, S. P. (2018). Tax Compliance at National Level. *Studia Universitatis „Vasile Goldis" Arad – Economics Series*, *28*(2), 1–17. https://doi.org/10.2478/sues-2018-0006

19. Brezeanu, P., Popa, A. F., Sahlian, D. N., Calopereanu, M. F., & Damian, R. T. (2019). Study on the fiscal behavior at an international level. *Proceedings of the International Conference on Business Excellence*, *13*(1), 601–612. https://doi.org/10.2478/picbe-2019-0053
20. Castiglioni, C., Lozza, E., van Dijk, E., & van Dijk, W. W. (2019). Two sides of the same coin? An investigation of the effects of frames on tax compliance and charitable giving. *Palgrave Communications*, *5*(1), 1–10. https://doi.org/10.1057/s41599-019-0247-4
21. Castro, L., & Scartascini, C. (2015). Tax compliance and enforcement in the pampas evidence from a field experiment. *Journal of Economic Behavior and Organization*, *116*, 65–82. https://doi.org/10.1016/j.jebo.2015.04.002
22. Chong, K. R., Yusri, Y., Selamat, A. I., & Ong, T. S. (2019). Tax climate manipulation on individual tax behavioural intentions. *Journal of Applied Accounting Research*, *20*(3), 230–242. https://doi.org/10.1108/JAAR-01-2019-0001
23. Choo, C. Y. L., Fonseca, M. A., & Myles, G. D. (2016). Do students behave like real taxpayers in the lab? Evidence from a real effort tax compliance experiment. *Journal of Economic Behavior and Organization*, *124*, 102–114. https://doi.org/10.1016/j.jebo.2015.09.015
24. D'Attoma, J. (2017). Divided nation: The north-south cleavage in Italian tax compliance. *Polity*, *49*(1), 69–99. https://doi.org/10.1086/689982
25. Damayanti, T. W., Nastiti, P. K. Y., & Supramono, S. (2020). Does tax amnesty influence intention to comply?: If students are taxpayers already. *Business Management and Education*, *18*(1), 1–13. https://doi.org/10.3846/bme.2020.10292
26. Damayanti, T. W., Sutrisno, Subekti, I., & Baridwan, Z. (2015). Trust and Uncertainty Orientation: An Efforts to Create Tax Compliance in Social Psychology Framework. *Procedia - Social and Behavioral Sciences*, *211*(September), 938–944. https://doi.org/10.1016/j.sbspro.2015.11.124
27. Dare, C. (2020). The impact of changes in audits and penalties on tax compliance behaviour: evidence from South Africa. *Southern African Business Review*, *24*. https://doi.org/10.25159/1998-8125/4824
28. Diakomihalis, M. (2020). Factors of Tax Evasion in Greece: Taxpayers' Perspective. *Journal of Tax Reform*, *6*(2), 180–195. https://doi.org/10.15826/jtr.2020.6.2.081
29. Díaz Caro, C., & Crespo Cebada, E. (2016). Taxation of capital gains and Lock-in effect in the Spanish Dual Income Tax. *European Journal of Management and Business Economics*, *25*(1), 15–21. https://doi.org/10.1016/j.redee.2015.11.001
30. Dobos, P., & Takács-György, K. (2020). The impact of the relationship between the state, state institutions and tax payers on willingness to pay tax. *Serbian Journal of Management*, *15*(1), 69–80. https://doi.org/10.5937/SJM15-21750
31. e Hassan, I., Naeem, A., & Gulzar, S. (2021). Voluntary tax compliance behavior of individual taxpayers in Pakistan. *Financial Innovation*, *7*(1). https://doi.org/10.1186/s40854-021-00234-4
32. Enachescu, J., Olsen, J., Kogler, C., Zeelenberg, M., Breugelmans, S. M., & Kirchler, E. (2019). The role of emotions in tax compliance behavior: A mixed-methods approach. *Journal of Economic Psychology*, *74* (October 2018), 102194. https://doi.org/10.1016/j.joep.2019.102194
33. Fack, G., Landais, C. (2016). The effect of tax enforcement on tax elasticities: Evidence from charitable contributions in France. *Journal of Public Economics, 133 (2016)*, 23-40. http://dx.doi.org/10.1016/j.jpubeco.2015.10.004
34. Fjeldstad, O. H., & Semboja, J. (2001). Why people pay taxes: The case of the development levy in Tanzania. *World Development*, *29*(12), 2059–2074. https://doi.org/10.1016/S0305-750X(01)00081-X

35. Gamannossi degl'Innocenti, D., & Rablen, M. D. (2020). Tax evasion on a social network. *Journal of Economic Behavior and Organization*, *169*, 79–91. https://doi.org/10.1016/j.jebo.2019.11.001
36. Gangl, K., Hartl, B., Hofmann, E., & Kirchler, E. (2019). The relationship between Austrian tax auditors and self-employed taxpayers: Evidence from a qualitative study. *Frontiers in Psychology*, *10*(MAY), 1–13. https://doi.org/10.3389/fpsyg.2019.01034
37. Gangl, K., Hofmann, E., & Kirchler, E. (2015). Tax authorities' interaction with taxpayers: A conception of compliance in social dilemmas by power and trust. *New Ideas in Psychology*, *37*, 13–23. https://doi.org/10.1016/j.newideapsych.2014.12.001
38. Gangl, K., & Torgler, B. (2020). How to Achieve Tax Compliance by the Wealthy: A Review of the Literature and Agenda for Policy. *Social Issues and Policy Review*, *14*(1), 108–151. https://doi.org/10.1111/sipr.12065
39. Gangl, K., van Dijk, W. W., van Dijk, E., & Hofmann, E. (2020). Building versus maintaining a perceived confidence-based tax climate: Experimental evidence. *Journal of Economic Psychology*, *81*(August), 102310. https://doi.org/10.1016/j.joep.2020.102310
40. Gillitzer, C., & Sinning, M. (2020). Nudging businesses to pay their taxes: Does timing matter? *Journal of Economic Behavior and Organization*, *169*, 284–300. https://doi.org/10.1016/j.jebo.2019.11.020
41. Gobena, L. B., & Van Dijke, M. (2017). Fear and caring: Procedural justice, trust, and collective identification as antecedents of voluntary tax compliance. *Journal of Economic Psychology*, *62*, 1–16. https://doi.org/10.1016/j.joep.2017.05.005
42. Górecki, M. A., & Letki, N. (2020). Social Norms Moderate the Effect of Tax System on Tax Evasion: Evidence from a Large-Scale Survey Experiment. *Journal of Business Ethics*, *2003*. https://doi.org/10.1007/s10551-020-04502-8
43. Goumagias, N. D., Hristu-Varsakelis, D., & Assael, Y. M. (2018). Using deep Q-learning to understand the tax evasion behavior of risk-averse firms. *Expert Systems with Applications*, *101*, 258–270. https://doi.org/10.1016/j.eswa.2018.01.039
44. Hashimzade, N., & Myles, G. (2017). Risk-based Audits in a Behavioral Model. *Public Finance Review*, *45*(1), 140–165. https://doi.org/10.1177/1091142115602062
45. Hashimzade, N., Myles, G. D., Page, F., & Rablen, M. D. (2014). Social networks and occupational choice: The endogenous formation of attitudes and beliefs about tax compliance. *Journal of Economic Psychology*, *40*, 134–146. https://doi.org/10.1016/j.joep.2012.09.002
46. Hashimzade, N., Myles, G. D., & Rablen, M. D. (2016). Predictive analytics and the targeting of audits. *Journal of Economic Behavior and Organization*, *124*, 130–145. https://doi.org/10.1016/j.jebo.2015.11.009
47. Hofmann, E., Hoelzl, E., & Kirchler, E. (2008). Preconditions of voluntary tax compliance: Knowledge and evaluation of taxation, norms, fairness, and motivation to cooperate. *Journal of Psychology*, *216*(4), 209–217. https://doi.org/10.1027/0044-3409.216.4.209
48. Holler, M., Hoelzl, E., Kirchler, E., Leder, S., & Mannetti, L. (2008). Framing of information on the use of public finances, regulatory fit of recipients and tax compliance. *Journal of Economic Psychology*, *29*(4), 597–611. https://doi.org/10.1016/j.joep.2008.01.001
49. Kettle, S., Hernandez, M., Sanders, M., Hauser, O., & Ruda, S. (2017). Failure to CAPTCHA attention: Null results from an honesty priming experiment in Guatemala. *Behavioral Sciences*, *7*(2). https://doi.org/10.3390/bs7020028
50. Kim, H. S., & Lee, H. A. (2020). Associations among procedural fairness, tax compliance, and tax re-audits. *Journal of Asian Finance, Economics and Business*, *7*(7), 187–198. https://doi.org/10.13106/jafeb.2020.vol7.no7.187

51. Kireenko, A. P., Nevzorova, E. N., Kireyeva, A. F., Filippovich, A. S., & Khoroshavina, E. S. (2018). Lab experiment to investigate tax compliance: the case of future taxpayers' behavior in Russia and Belarus. *Journal of Tax Reform*, *4*(3), 266–290. https://doi.org/10.15826/jtr.2018.4.3.056
52. Koretskaya-Garmash, V. A. (2017). Taxation Awareness and its Impact on Financial Literacy. *Journal of Tax Reform*, *3*(2), 131–148. https://doi.org/10.15826/jtr.2017.3.2.036
53. Lesnik, T., Kracun, D., & Jagric, T. (2014). Tax Compliance And Social Security Contributions - The Case Of Slovenia. *Transylvanian Review of Administrative Sciences*, *42*, 94–115.
54. López-Laborda, J., Vallés-Giménez, J., & Zárate-Marco, A. (2018). Income Shifting in the Spanish Dual Income Tax*. *Fiscal Studies*, *39*(1), 95–120. https://doi.org/10.1111/j.1475-5890.2017.12147
55. Lopez-Luzuriaga, A., & Scartascini, C. (2019). Compliance spillovers across taxes: The role of penalties and detection. *Journal of Economic Behavior and Organization*, *164*, 518–534. https://doi.org/10.1016/j.jebo.2019.06.015
56. Lozza, E., & Castiglioni, C. (2018). Tax climate in the national press: A new tool in tax behaviour research. *Journal of Social and Political Psychology*, *6*(2), 401–419. https://doi.org/10.5964/jspp.v6i2.937
57. Mahangila, D., & Anderson, W. (2017). Tax administrative burdens in the tourism sector in Zanzibar: Stakeholders' perspectives. *SAGE Open*, *7*(4). https://doi.org/10.1177/2158244017736800
58. Mogollon, M., Ortega, D., & Scartascini, C. (2021). Who's calling? The effect of phone calls and personal interaction on tax compliance. *International Tax and Public Finance*, *0123456789*. https://doi.org/10.1007/s10797-021-09655-4
59. Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., Atkins, D., Barbour, V., Barrowman, N., Berlin, J. A., Clark, J., Clarke, M., Cook, D., D'Amico, R., Deeks, J. J., Devereaux, P. J., Dickersin, K., Egger, M., Ernst, E., … Tugwell, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, *6*(7). https://doi.org/10.1371/journal.pmed.1000097
60. Molodykh, V. A., & Rubezhnoy, A. A. (2017). Tax Compliance and the Choice of an Optimum Strategy for the Economic Agents. *Journal of Tax Reform*, *3*(3), 216–225. https://doi.org/10.15826/jtr.2017.3.3.041
61. Muhammad, I. (2013). An Exploratory Study of Malaysian Tax Auditors' Enforcement Regulatory Styles. *Procedia Economics and Finance*, *7*(Icebr), 188–196. https://doi.org/10.1016/s2212-5671(13)00234-7
62. Muhammad, I. (2017). Post Implementation of Goods and Services Tax (GST) in Malaysia: Tax Agents' Perceptions on Clients' Compliance Behaviour and Tax Agents' Roles in Promoting Compliance. *SHS Web of Conferences*, *34*, 11002. https://doi.org/10.1051/shsconf/20173411002
63. Murphy, K., Bradford, B., & Jackson, J. (2016). Motivating Compliance Behavior Among Offenders: Procedural Justice or Deterrence? *Criminal Justice and Behavior*, *43*(1), 102–118. https://doi.org/10.1177/0093854815611166
64. Murphy, K., & Harris, N. (2007). Shaming, shame and recidivism. *British Journal of Criminology*, *47*(6), 900–917. https://doi.org/10.1093/bjc/azm037
65. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOMENT (2010). Understanding and Influencing Taxpayers' Compliance Behaviour
66. Onu, D., & Oats, L. (2018). Tax Talk: An Exploration of Online Discussions Among Taxpayers. *Journal of Business Ethics*, *149*(4), 931–944. https://doi.org/10.1007/s10551-016-3032-y

67. Otsu, T., Xu, K. L., & Matsushita, Y. (2013). Estimation and inference of discontinuity in density. *Journal of Business and Economic Statistics*, *31*(4), 507–524. https://doi.org/10.1080/07350015.2013.818007
68. Paetzold, J. (2019). How do taxpayers respond to a large kink? Evidence on earnings and deduction behavior from Austria. In *International Tax and Public Finance* (Vol. 26, Issue 1). Springer US. https://doi.org/10.1007/s10797-018-9493-4
69. Palil, M. R., Malek, M. M., & Jaguli, A. R. (2016). Issues, challenges and problems with tax evasion: The institutional factors approach. *Gadjah Mada International Journal of Business*, *18*(2), 187–206. https://doi.org/10.22146/gamaijb.12573
70. Pomeranz, D., & Vila-Belda, J. (2019). Taking State-Capacity Research to the Field: Insights from Collaborations with Tax Authorities. *Annual Review of Economics*, *11*, 755–781. https://doi.org/10.1146/annurev-economics-080218-030312
71. Prasetyo, D. Y., Adi, P. H., & Damayanti, T. W. (2020). Overconfidence, gender and tax compliance: The Indonesian evidence. *Montenegrin Journal of Economics*, *16*(4), 135–143. https://doi.org/10.14254/1800-5845/2020.16-4.11
72. Saad, N. (2012). *Tax Non-Compliance Behaviour : Taxpayers View*. *65*(ICIBSoS), 344–351. https://doi.org/10.1016/j.sbspro.2012.11.132
73. Saad, N. (2014). Tax Knowledge , Tax Complexity and Tax Compliance : Taxpayers ' View. *Procedia - Social and Behavioral Sciences*, *109*(1), 1069–1075. https://doi.org/10.1016/j.sbspro.2013.12.590
74. Sellywati Mohd Faizal, Mohd Rizal Palil, R. M. & R. R. (2017). Power and Trust as Factors Influencing Tax Compliance Behavior in Malaysia. *Asian Journal of Accounting and Governance*, *8*, 79–85. https://doi.org/10.17576/ajag-2017-08-07
75. Shafer, W. E., Wang, Z., & Hsieh, T. S. (2020). Support for economic inequality and tax evasion. *Sustainability (Switzerland)*, *12*(19), 1–18. https://doi.org/10.3390/su12198025
76. Slemrod, J. (1994). Fixing the leak in Okun's bucket optimal tax progressivity when avoidance can be controlled. *Journal of Public Economics*, *55*(1), 41–51. https://doi.org/10.1016/0047-2727(94)90079-5
77. Stankevicius, E., & Leonas, L. (2015). Hybrid Approach Model for Prevention of Tax Evasion and Fraud. *Procedia - Social and Behavioral Sciences*, *213*, 383–389. https://doi.org/10.1016/j.sbspro.2015.11.555
78. Sudavicius, B., & Endrijaitis, M. (2020). Increased tax rates in the taxation system of the Republic of Lithuania. *Law Enforcement Review*, *4*(2), 28–40. https://doi.org/10.24147/2542-1514.2020.4(2).28-40
79. Suh, J. W., Lee, H. Y., Kuk, A. E., & Ryu, H. (2019). Effect of the trusted taxpayer designation on corporate tax avoidance behaviour: Evidence from Korea. *Asian Journal of Business and Accounting*, *12*(2), 121–146. https://doi.org/10.22452/ajba.vol12no2.5
80. Syuhada, N., Hassan, A. B. U., Palil, M. R., & Ramli, R. (2021). Does Compliance Strategy Increase Compliance? Evidence from Malaysia. *Asian Journal of Accounting and Governance*, *15*, 1–14. https://doi.org/10.17576/ajag-2021-15-02
81. Todor, S. P., Brezeanu, P., Dumiter, F., & Ghiur, R. (2019). The taxpayer's behavior at south – Eastern European level. *Economic Computation and Economic Cybernetics Studies and Research*, *53*(2), 203–220. https://doi.org/10.24818/18423264/53.2.19.12
82. Wołowiec, T. (2018). Potential and Possible Ways of Harmonizing the Personal Income Taxation Process. *Comparative Economic Research*, *21*(3), 109–130. https://doi.org/10.2478/cer-2018-0022
83. Yahyaoui, F., & Tkiouat, M. (2018). Partially observable Markov methods in an agent-based simulation: A tax evasion case study. *Procedia Computer Science*, *127*, 256–263. https://doi.org/10.1016/j.procs.2018.01.121

84. Yefimenko, T. I. (2016). Taxation in reforms of public finance management. *Journal of Tax Reform*, *2*(1), 6–24. https://doi.org/10.15826/jtr.2016.2.1.014

HEY ALEXA! – THE GREAT ADVERTISING POTENTIAL OF IOT (THE INTERNET OF THINGS)

Arpad Papp-Vary
Budapest Metropolitan University,
1-9 Nagy Lajos király útja, Budapest, 1148, Hungary
apappvary@metropolitan.hu

Reka Kerti
Budapest Metropolitan University,
1-9 Nagy Lajos király útja, Budapest, 1148, Hungary
Rekakerti@yahoo.com

ABSTRACT

The Internet of Things (IoT) is one of the hottest buzzwords in advertising, with new research and recommendations frequently appearing on the subject. The literature is vast, so this paper aims to analyse the opportunities and threats of smart speakers, such as Alexa. Smart speakers were chosen, as these are some of the most popular IoT devices for consumers. However, brands face several challenges associated with the usage of IoT. The paper begins with a brief background to the IoT, with history, definitions, and key statistics. Afterwards, the required mind-set shift from the industry to adapt successfully into their business model is explored. Subsequently, the implications of the changing consumer behaviour are investigated; this includes case studies presenting best practices. The last issue analysed in this paper is the legal and ethical implications of the IoT that advertisers have to consider when planning campaigns. Finally, the paper includes thoughts for future research.

Keywords: *internet of things, IoT, Amazon Alexa, smart speakers, brands, advertising, consumer behaviour*

1. INTRODUCTION

The Internet of Things (IoT) may be a new term, but these devices have been with us for a while; the first smart vending machine was introduced in the 1980s (The little-known story of the first IoT device, 2018). The number of IoT devices that people interact with has been growing rapidly. Statista (2020), one of the best known online statistics website estimates that the total number of installed IoT devices worldwide will be approximately 30 billion units by 2025. This growth in the number of IoT devices is facilitated by 5G mobile networks, the latest innovation in telecommunications technology (Akpakwu, Silva, Hancke, & Abu-Mahfouz, 2017). The first generation (1G) of networks was voice-only, 2G brought voice and texting, 3G added data, 4G did the same as 3G but faster, and 5G is even faster. This speed is necessary to support the growing network of IoT (Collela, n.d.). First, what is understood as an IoT device needs to be defined. It is simply any device that is connected to the internet, from wearables (potentially with visual search, augmented reality, or virtual reality capabilities), smart TVs, and smart speakers to devices that create futuristic smart cities (Why Media is Important and The Future of Media, 2021). This paper focuses on consumer-facing IoT devices, in particular smart speakers, and their impact on advertising.

2. BUSINESS MODEL CHANGES

According to The World Economic Forum, 500 million tweets and 294 billion emails are sent, 5 billion searches are entered, 4 petabytes of data are created on Facebook, and 4 terabytes of data are created from each connected car, each day. By 2025, it is estimated that 463 exabytes of data will be created each day globally – the equivalent of 212,765,957 DVDs per day

(Desjardins, 2019). IoT devices are integral to fuelling 'big data', which is presented as the next revolution in business. This change gives access to even more data than before in environments (for example, in cars) where companies did not previously have access to customer tracking. Because of this data revolution, companies have access to data more powerful than ever before. For example, digital-native companies like Amazon are built on this data. Stores that sell online can track not only the latest trends, but they can also view shopping behaviour on an individual level, and with specific tracking, they can also see what a customer showed interest in but did not buy finally. They can then use this data to build learning and real-time optimising algorithms that predict what the customer will be interested in next (McAfee & Brynjolfsson, 2012). However, raw data – that may be too voluminous or too unstructured to analyse in traditional ways – on its own is not very useful (Davenport, Barth & Bean, 2012). This affects agency structure and processes. There is a new job role that is highly sought after in the industry: data analyst, a role with an advanced understanding of how to analyse and process data in real-time (Tesseras, 2021). Moreover, these individuals also need business and marketing experience, for example, they need to know that correlation does not necessarily mean causation in the industry, as search advertising may generate the highest number of final sales, but a percentage of sales would have happened without these ads anyway (Mela & Moorman, 2018). Therefore, this role requires candidates with highly specific knowledge, skills, and experience. Besides this new requirement, several specialisms exist within agencies, such as strategists, account managers, media buyers, content, sponsorships, research departments, etc. This creates many siloes within agencies, making the job more complex than ever. To manage this complexity, it makes the role of integrated planners essential to the success of advertising. The role of the specialist is to provide subject matter expertise, but this knowledge may create a disjointed consumer experience without the big picture thinking that an integrated planner provides. Therefore, the integrated planner has a critical role, understanding all the touchpoints, and using this understanding, to consolidate these concepts into an interconnected ecosystem.

3. REACTING TO CHANGING CONSUMER BEHAVIOUR

Echo, Amazon's first smart speaker, debuted in 2014, and despite Google and Apple launching their version of smart speakers, it has kept its coveted number one position ever since (Welch, 2014; Bohn, 2016; HomePod reinvents music in the home, 2017). It is estimated that the installed base of smart speakers has reached 320 million units globally, and brands are taking advantage of this meteoric rise (Installed base of smart speakers worldwide in 2020 and 2024, 2021). Moreover, in just over three years, smart speakers enabled by Amazon's Alexa - a virtual assistant AI technology, one of the main examples of IoT devices - have gone from having 130 skills to over 100,000 skills (Smith, 2020; Total number of Amazon Alexa skills from January 2016 to September 2019, 2019). Amazon started the revolution of screen-free e-commerce with the humble Dash buttons, and now the company is complementing it with an Alexa-enabled voice shopping experience. Amazon incentivises this approach to online shopping. This is appealing to consumers, as it makes shopping more convenient and offloads decision-making for small choices to Artificial Intelligence (AI) (Gartenberg, 2017). Besides the device's perceived ease of use, another strong motivator for usage is enjoyment (Kowalczuk, 2018). People seem to love Amazon's Alexa, and its Super Bowl ad was the most-watched one on YouTube (during the show) (Cohen, 2020). Brands need to understand and discover how to work with these AI algorithms or risk missing a growing number of valuable consumer interactions. For example, Burger King attempted to hack these AI algorithms with a commercial that voice-activated IoT devices when asked, "What is The Whopper burger?" This prompted the device to read out the Wikipedia entry for the Whopper (Diaz, 2017). Other brands took a more traditional approach; for example, Diageo worked with Amazon and created a cocktail mixing Alexa skill to increase at-home consumption moments (Diageo launches

'happy hour' skill, 2018). O2 enhanced their sponsorship of England rugby with a bespoke Alexa skill that featured exclusive pre- and post-match content from rugby legend Jonny Wilkinson (Have Jonny Wilkinson, 2018). NARS, a high-end cosmetics brand, served an ad to those listening to music on a smart speaker, enabling consumers to request a free sample of one of their products via voice-only controls (Calladine & Healy, 2020). These ads show great promise in research. For example, a study in 2018 found that when consumers interacted with an advertisement delivered via smart speakers, the effects of these ads were more significant than the effects of traditional one-way ads (Kim, Park, Park, Ju & Ahn, 2018).

4. PRESSING LEGAL AND ETHICAL CONCERNS ARE RISING

There are several concerns with these devices, beginning on a personal level with Amazon's name for the assistant: Alexa. Parents have expressed disappointment because their children with the same name became targets of bullying at a young age. As a result, some of these children experienced deeper mental health problems, and families even needed to take drastic measures, such as change the children's names and move to a new school (Johns, 2021). Additionally, there are broader security concerns associated with these devices, and these have attracted ample media attention. For example, a device sent a recording of a family's private conversation to a random person on their contact list (Kim, 2018). These are more widespread concerns; for example, when probing Amazon Alexa skills, security experts found that hundreds of these skills requested access to sensitive data without an established set of privacy policies in the first place (Winder, 2021). A recently announced new development called Amazon Sidewalk will be automatically enabled in Alexa devices, sharing a little slice of internet connectivity with nearby devices. This will make setting up new devices easier and allow seamless streaming of outdoor cameras or pet trackers – even when out of range. It is a great enhancement of experience; however, it comes with its own security concerns. Amazon Sidewalk can make it easier for strangers to access the home network and, as a result, seamlessly access the devices (smartphones, laptops) connected to it (Chase, 2021). Despite these concerning developments, privacy protection behaviours among consumers are uncommon (Lutz & Newlands, 2021). Consumers do not want to read excessive Terms & Conditions, and a study found that almost half of the surveyed smart speaker users were unaware that their recordings were permanently stored or that they can delete them (Cakebread, 2017; Malkin, Deatrick, Tong, Wijesekera, Egelman & Wagner, 2019). Another study found that consumers are not concerned about their privacy because they trust the companies behind these devices to do what is required to protect their data (Yao, Basdeo, Mcdonough & Wang, 2019). Therefore, brands should take responsibility for their data management processes. The General Data Protection Regulation (GDPR), which came into effect in Europe in 2018, is legislation that shows positive progress. GDPR defines the legal requirements for brands to adhere to when dealing with personal data (Principles of the GDPR, n.d.). However, the pace of new technologies emerging is fast, meaning advertisers and regulators will need to work tirelessly to achieve the same level of progress with the accompanying laws and regulations to use consumer data responsibly.

5. CONCLUSION

The IoT, and smart speakers are a new space full of exciting opportunities and business potential for advertising professionals. Brands that want to advantage 'big data', which this fuels need to adjust their business model: agencies need data specialists to help analyse, and process the data, and subsequently turn it into actionable insights. To maximise effectiveness of the work of these specialists, integrated planners are necessary to ensure these insights are aligned at all levels. Smart speakers can also deliver ads to consumers. The initial brand solutions covered in this paper include brand building, high-profile sponsorship amplification, and sampling promotions.

However, regardless the chosen role of smart speakers, brands need to be mindful of pressing legal and ethical concerns, especially because consumers see it as their role. Future research might examine the effectiveness of these ads, for example, compare smart speaker ads with other voice-based ads on traditional radio, online radio, or podcasts. In addition, it would be also interesting to investigate any differences in effectiveness between categories and consumer segments. Today, smart speaker ads may be just a little more than an innovative solution that can only secure a small percentage of the advertising budget. However, as influencer marketing was also in a similar position a couple of years ago, the authors of this article predict that smart speaker ads have great potential in the future based on consumer trends.

LITERATURE:

1. Akpakwu, G. A., Silva, B. J., Hancke, G. P., & Abu-Mahfouz, A. M. (2017). A survey on 5G networks for the Internet of Things: Communication technologies and challenges. *IEEE access*, 6, 3619-3647.
2. Bohn, D. (2016). *Google Home: a speaker to finally take on the Amazon Echo.* The Verge. Retrieved 11 June 2021 from https://www.theverge.com/2016/5/18/11688376/google-home-speaker-announced-virtual-assistant-io-2016
3. Cakebread, C. (2017). *You're not alone, no one reads terms of service agreements.* Business Insider. Retrieved 10 March 10 2021 from https://www.businessinsider.com/deloitte-study-91-percent-agree-terms-of-service-without-reading-2017-11
4. Calladine, D. & Healy, S. (2020) *Carat Trends 2021*. Carat. Retrieved 15 March 2021 from https://www.carat.com/thoughts-and-views/Carat-2021-media-trends
5. Chase, J. (2021). *Amazon Sidewalk Will Share Your Internet With Strangers. It's Not As Scary As It Sounds.* New York Times. Retrieved 11 June 2021 from https://www.nytimes.com/wirecutter/blog/amazon-sidewalk-review/
6. Cohen, D. (2020). *Amazon's #BeforeAlexa Was This Year's Most-Watched Super Bowl Ad on YouTube (During the Game).* Adweek. Retrieved 11 June 2021 from https://www.adweek.com/performance-marketing/amazons-beforealexa-was-this-years-most-watched-super-bowl-ad-on-youtube-during-the-game/
7. Collela, P. (n.d.) *5G and IoT: Ushering in a new era.* Ericsson. Retrieved 11 June 2021 from https://www.ericsson.com/en/about-us/company-facts/ericsson-worldwide/india/authored-articles/5g-and-iot-ushering-in-a-new-era
8. Davenport, T. H., Barth, P., & Bean, R. (2012). How 'big data' is different. *Harvard Business School.* Retrieved 11 June 2021 from https://www.hbs.edu/ris/Publication%20Files/SMR-How-Big-Data-Is-Different_782ad61f-8e5f-4b1e-b79f-83f33c903455.pdf
9. Desjardins, J. (2019). *How much data is generated each day?* World Economic Forum. Retrieved 11 June 2021 from https://www.weforum.org/agenda/2019/04/how-much-data-is-generated-each-day-cf4bddf29f/
10. *Diageo launches 'happy hour' skill for Amazon Alexa celebrating one of the most spirited hours in the day* (2018). Diageo. Retrieved 15 March 2021 from https://www.diageo.com/en/news-and-media/press-releases/diageo-launches-happy-hour-skill-for-amazon-alexa-celebrating-one-of-the-most-spirited-hours-in-the-day/
11. Diaz, A. (2017) *Burger King's Google Home hack wins Cannes Grand Prix in direct.* Ad Age. Retrieved 15 March 2021 from https://adage.com/article/special-report-cannes-lions/burger-king-s-google-home-hack-takes-grand-prix-direct/309506
12. Gartenberg, C. (2017). *How to shop on Amazon using Alexa voice controls.* The Verge. Retrieved 15 March 2021 from https://www.theverge.com/2017/7/10/15947672/amazon-alexa-voice-controls-shopping-prime-echo-how-to

13. *Have Jonny Wilkinson in your living room with the new 'Wear the Rose with O2' Skill for Alexa.* (2018). O2. Retrieved 11 June 2021 from https://news.o2.co.uk/press-release/have-jonny-wilkinson-in-your-living-room-with-the-new-wear-the-rose-with-o2-skill-for-alexa/
14. *HomePod reinvents music in the home*. (2017). Apple. Retrieved 11 June 2021 from https://www.apple.com/newsroom/2017/06/homepod-reinvents-music-in-the-home/
15. *Installed base of smart speakers worldwide in 2020 and 2024*. (2021). Statista. Retrieved 11 June from https://www.statista.com/statistics/878650/worldwide-smart-speaker-installed-base-by-country/
16. *Internet of Things (IoT) and non-IoT active device connections worldwide from 2010 to 2025.* (2020). Statista. Retrieved 9 March 2021 from https://www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/
17. Johns, T. (2021). *Parents of children called Alexa challenge Amazon*. BBC. Retrieved 5 July 2021 from https://www.bbc.co.uk/news/technology-57680173
18. Kim, D., Park, K., Park, Y., Ju, J., & Ahn, J. H. (2018). Alexa, Tell Me More: The Effect of Advertisements on Memory Accuracy from Smart Speakers. In *PACIS* (p. 204).
19. Kim, E. (2018). *Amazon Echo secretly recorded a family's conversation and sent it to a random person on their contact list.* CNBC. Retrieved 12 March 2021 from https://www.cnbc.com/2018/05/24/amazon-echo-recorded-conversation-sent-to-random-person-report.html#:~:text=A%20family%20in%20Portland%20says,a%20message%20to%20a%20contact
20. Kowalczuk, P. (2018). "Consumer acceptance of smart speakers: a mixed methods approach", *Journal of Research in Interactive Marketing*, Vol. 12 No. 4, pp. 418-431. https://doi.org/10.1108/JRIM-01-2018-0022
21. Lutz, C., & Newlands, G. (2021). Privacy and smart speakers: A multi-dimensional approach. *The Information Society*, 1-16.
22. Malkin, N., Deatrick, J., Tong, A., Wijesekera, P., Egelman, S., & Wagner, D. (2019). Privacy attitudes of smart speaker users. *Proceedings on Privacy Enhancing Technologies*, 2019(4).
23. McAfee, A., & Brynjolfsson, E. (2012). Big Data: The Management Revolution. *Harvard Business Review*. 90(10), 60-68.
24. Mela, C. F. & Moorman, C. (2018). *Why Marketing Analytics Hasn't Lived Up to Its Promise.* Forbes. Retrieved 11 June 2021 from https://hbr.org/2018/05/why-marketing-analytics-hasnt-lived-up-to-its-promise
25. *Principles of the GDPR.* (n.d.). European Commission. Retrieved 12 March 2021 from https://ec.europa.eu/info/law/law-topic/data-protection/reform/rules-business-and-organisations/principles-gdpr_en
26. Smith, K. T. (2020). Marketing via smart speakers: what should Alexa say? *Journal of Strategic Marketing*, 28(4), 350-365.
27. Tesseras, L. (2021). *Steep rise in demand for marketers with digital skills.* Marketing Week. Retrieved 12 March 2021 from https://www.marketingweek.com/steep-rise-demand-marketers-digital/
28. *The little-known story of the first IoT device.* (2018). IBM. Retrieved 10 March 2021 from https://www.ibm.com/blogs/industries/little-known-story-first-iot-device/
29. *Total number of Amazon Alexa skills from January 2016 to September 2019.* (2019). Statista. Retrieved 13 March 2021 from https://www.statista.com/statistics/912856/amazon-alexa-skills-growth/
30. Welch, C. (2014). *Amazon just surprised everyone with a crazy speaker that talks to you.* Verge. Retrieved 11 June 2021 from https://www.theverge.com/2014/11/6/7167793/amazon-echo-speaker-announced

31. *Why Media is Important and The Future of Media*. (2021). IPA. Retrieved 17 February 2021 from https://ipaacademy.ipa.co.uk/pluginfile.php/22968/mod_scorm/content/2/index_lms.html#/id/5fd7322ce02e5f1637a8ded3
32. Winder, D. (2021). *Security Researchers Probed 90,194 Amazon Alexa Skills—The Results Were Shocking*. Forbes. Retrieved 13 March 2021 from https://www.forbes.com/sites/daveywinder/2021/03/07/security-researchers-probed-90194-amazon-alexa-skills-the-results-were-shocking/?sh=4190b3702800
33. Yao, Y., Basdeo, J. R., Mcdonough, O. R., & Wang, Y. (2019). Privacy perceptions and designs of bystanders in smart homes. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 1-24.

THE CONCEPT OF THE RIGHT OF SQUEEZE-OUT ACCORDING TO THE LEGISLATIVE FRAMEWORK OF THE SLOVAK REPUBLIC

Katarina Kramarova
University of Zilina in Zilina, Faculty of Operation and Economics of Transport and Communication, Department of Economics, Slovakia
katarina.kramarova@fpedas.uniza.sk

ABSTRACT
The right of squeeze-out is a legal institute pursuing economic interests of shareholders. The primary goal of this institute is to be an uncompromising and especially effective solution resulting from the position of the majority shareholder and minority shareholder(s) in the offeree company and their economic interests as well interests with regards to the future management and direction of the offeree company. In theory it is a mechanism that should lead to the economic efficiency of the offeree company in order to increase its competitiveness if it reaches a stage of life in which the fragmentation of the ownership structure is unacceptable for this goal. The rationale for the existence of a legitimate way of squeezing out minority shareholders is therefore justified, but only if their property rights are "fairly" compensated. From a procedural point of view, the right of squeeze-out is a tool ousting minority shareholders from the offeree company, whose legislation is closely related to the corporate law, the law protecting the interests of shareholders, and at the same time the law governing the capital market and activities of its subjects in a close connection with the transfer of ownership rights from minority shareholders to the majority shareholders and related rights and obligations. In the context of the right of squeeze-out perceived in this way, the aim of the paper is to theoretically defend the existence of the right of squeeze-out, provided that the consideration rights of minority shareholders are accepted and subsequently to identify possible shortcomings of the right of squeeze-out at a practical level, all with regard to the legislation of in force in the Slovak Republic.
Keywords: *Fair value, Offeree company, Shareholder´s rights, Squeeze-out*

1. INTRODUCTION

The definition of the term squeeze-out itself, as well as its procedural content, is not unitary. In the general definition it is presented as a means of eliminating ownership rights of one group of owners by another group of owners using their strategic position in the company, management power or legal means regardless of the legal form of the company. O'Neal (1961) extends this definition and he matches it also with any oppressive actions to reduce to deprive unfairly of income or advantages of minority shareholders. From the point of view of the corporate governance, squeeze-out transactions are seen as one of corporate governance endgames (Crocia et al., 2013). From a practical point of view, it is a process of concentrating a fragmented ownership structure to optimize the management of the company and the resulting current or future (expected) benefits. Although there are cases in which minority and majority owners coexist without any incidents, there are also cases in which this coexistence is not possible, even rationale. The concentration of fragmented ownership structure is precisely through a squeeze-out in the abstract level, respectively on a theoretical level, it therefore aims to contribute to resolving the divergence in interests and related disputes between the majority and minority owners. (Sedlakova, et al., 2019, Van der Elst – Van den Steen, 2006, Van der Elst – Van den Steen, 2009) For both groups of owners, if we consider the rational behaviour of the entities, their primary interests are the profitability of the company in the short term and increasing the market value of the company in the long term. The existing high fragmentation of the ownership structure potentially creates an interest in corporate governance in several

entities, which, however, can (and in many cases practice has shown) be an obstacle to effective corporate governance and lead to a complex process of finding compromises in enforcing important decisions. At the same time, it also should be noted that the lack of interest in the development of the company by minority shareholders is an eliminating factor for further development of the company. This is except others typical for of the Slovakia and the companies that have undergone the privatization process, while part of the shares of these companies is in the hands of "small" shareholders with no interest in the further development of the company. Hopt (2001) precisely emphasizes this fact. I.e., the primary principal-agent conflict in European companies and in the continental European corporate laws is not the conflict between the shareholders and the board of directors, but rather the conflict between the minority and majority shareholders. The agency problems and agency costs generated in this way thus create a difference in the value of the same company under the assumption of "unanimous decision-making" and under the assumption of "fragmented decision-making". (Sedlakova, et al., 2019) This is closely related to the business risk and investment risk, which is much higher in the case of the majority shareholder compared to minority shareholders, respectively is proportional to the size of their investment (Pokorna, 2003, Huddart, 1993). Squeeze-out, in a narrower sense, is characteristic of publicly traded joint-stock companies and in terms of the mechanism of functioning of capital markets is perceived, among other things, as one of the possible means to ensure the transformation of publicly traded joint-stock companies into closed ones (delisting). The theory of the financial market law or the theory of the developed capital market includes squeeze-out in the regulation of market behaviour on the capital market or in the regulation of market exit, while it is closely related to the right of takeover, respectively with the institute of takeover bids. (Cunderlik, 2019, Langenbucher, 2017) Squeeze-out is thus a process and its various techniques, which shall result in a fair squeezing of the existing minority, which owns the rest of the shares of the joint-stock company, emphasizing the efficiency of corporate governance resulting from the concentration of the share capital by the majority. On the other hand, in the theoretical or practical level, it can be found several critical discussion or examples with conflicting views that associate squeeze-out with an expropriation. In connection with the above, the aim of the paper is to evaluate the effectiveness of squeeze-out as a legal institute in the context of current regulation with a link to the mechanism of capital market functioning in Slovakia and legislative rules for determining the price of consideration for minority shares. In the context of the right of squeeze-out perceived in this way, the aim of the paper is also to defend the existence of squeeze-out, provided that the rights of minority shareholders are fully and fairly compensated. In the context of this, also the valuation theory and the valuation legislative will be the focus of interest. The key scientific methods applied in the process of preparing the paper are the method of analysis, the method of opinion confrontation, the method of abstraction and synthesis. The subject of the analysis are studies that deal with the subject matter and, the Slovak legal regulation of squeeze-out.

2. LITERATURE OVERVIEW

One of the major agency conflicts that are characterized for business environment is the conflict resulting from the capital concentration between majority and minority shareholders (agency conflict type II.). Due to this conflict, in practise, there is mostly observed a divergence of opinions on the area of management remuneration, business direction of the company and its dividend or investment policy (Sedlakova et al., 2020, Sedlakova et al., 2019, Cunderlik, 2019, Chen et al., 2018, Noodezh et al., 2015, Heckova – Chapcakova, 2009, O´Neal, 1961 etc.). In many cases, the existing reluctance of a minority shareholder to sell shares (whether for financial or other reasons) may be the reason of actual illiquidity of the issue in the market which the shares are traded on.

Cunderlik (2019) states that the abuse of minority status is an extreme one of the opposites of the balance of ownership rights of all shareholders in publicly traded joint-stock companies. Holding shares in the hands of minority shareholders may become a short-term speculation to obtain the best price from the majority shareholder, not by selling a publicly available investment to other investors in the capital market. Therefore, if only the purely economic efficiency of joint-stock companies is monitored in accordance with the concept of increasing its competitiveness and increasing the value of the company itself, the concentration of the capital structure in the hands of the majority shareholder is society-wide beneficial (Cunderlik, 2019), and thus the existence of squeeze-out as a legal institute as socially accepted. From a legal point of view, this is the case if the rights of minority shareholders in terms of fair compensation are maintained at the same time (Follert, 2020, Sedlakova et al., 2020, Chen, 2020, Sedlakova et al., 2019, Vos, 2018, Van der Est – Van den Steen, 2009, Kaisanlahti, 2007, Dollinger, 2006) otherwise squeeze-out "per se" indicates expropriation. Crocia et al. (2012) in connection with a fair compensation of minority shareholders talk about wasted investment opportunities, if minority shareholders do not get an appropriate return on their investments when being squeezed out from the offeree company, since they will not have any additional chance in the future to get returns on those shares. The interest of the majority shareholder is to minimize the costs associated with acquiring a full control over the management of the target company, while the interest of minority shareholders is to maximize the financial return from the forced sale of shares in the company. (Bates et al., 2006) For this reason, the determination of the amount of consideration in most legislation falls within the competence of independent institutions, or it is within their competence to assess whether the performance shows signs of adequacy. E.g., Matschke (2013) state that the economic (financial) efficiency criterion can only be met by a mediator (i.e., mediating judge or expert depending on the process side of squeeze-out and fair value determination) who is able to determine the settlement price between the boundary values of shareholders. The way of compensation for the shares of squeezed shareholders as well as applied appraisal methods that are used to determine a fair value of shares in case of squeeze-out differ in single countries. At the theoretical level, it is possible to identify several valuation approaches, the aim of which is to determine the price of consideration for shares in a sophisticated way, if it is the right of squeeze-out. (Miliutis, 2013) In connection with that, there have been developed many theories and models that try to explain and subsequently to model the behaviour of different actors (the judge, an expert whose competence includes determining the appropriate consideration for the shares of squeezed shareholders, and both conflicting parties – majority shareholder and/or other shareholders that are acting in compliance with the majority shareholder, and minority shareholders) in the legal mediation procedure that should tend to the setting of fair price for shares of squeezed shareholders based on stereotypical interest of all actors. (Follert et al., 2018) Except that, the fair compensation of the minority is not only of the importance of business economics but also significant for political discussion since the assessment of the settlement of the minority shareholders provides insights to the significance of minority law protection in a society. (Follert, 2020) Miliutis (2013) emphasize that the applied valuation methodology must be a compromise solution, since any application of too pro-minority criteria in the process of a fair price setting in squeeze-out transactions may reduce the number of value-creating takeovers. However, on the other side, applying of too lenient criteria (pro-majority) to determine a fair price may encourage majority shareholders to behave opportunistically and subsequently lead to the initiation of transactions to the detriment of minority shareholders. In connection with that e.g., Sedlakova et al. (2019) emphasize that although squeeze-out is a particular economic transaction, primary general rights of shareholders incorporated in the corporate law must be met, including the right that none of shareholders may exercise own rights at the expense of the rights of other shareholders.

The squeeze-out regulation is not unitary, not even in the member states of the European Union (hereinafter "EU"), although there is a single directive – the Directive 2004/25/EC of the European Parliament and of the Council of 21 April 2004 on takeover bids (hereinafter "EU directive"). Although it defines minimal legal requirements for squeeze-out transactions in the EU countries including its definition as a conditional right that the majority shareholder may exercise only following the takeover bid, the procedural side of squeeze-out, methods of compensation of minority shareholders, valuation methods themselves, and institutional control over the transactions may vary considerably. Regarding the procedural side of squeeze-outs, it is in close connection with the legislative and functioning of the national capital markets as well. The origin of the material connection of the takeover bid with squeeze-out lies inter alia in the economic process of creating the concern. (Cunderlik, 2019) The EU directive can therefore be seen as a general and minimum regulation of rights of shareholders of companies which are traded on any regulated market of the EU, and which are governed by their law when these companies are the subject of a takeover bid or changes in control of the company, which includes the right of squeeze-out itself. At the same time it is clear from the written that squeeze-out is a cross-cutting and interdisciplinary issue between jurisprudence, economics and business economics theory, business valuation theory, and the practice mainly represented by the capital market functionality.

3. ANALYSIS OF SQUEEZE-OUT LEGISLATION IN THE SLOVAK REPUBLIC

3.1. Historical overview

The issue of squeeze-out has been incorporated into the Slovak legislation regulating the capital market, banking, and activities of their subjects in close connection with the amendments to corporate law as well. The squeeze-out right of majority shareholder (and or other shareholders acting in compliance with the majority shareholder) were processed and at the first time presented in the Act no. 644/2006 Coll. that amended and supplemented the Act no. 483/2001 Coll. on banks as amended and in the Act no. 209/2007 Coll. that amended and supplemented the Act no. 566/2001 Coll. on securities and investment services as amended (hereinafter "SA"). By transposing the EU directive into the Slovak legal norms, the majority shareholder has acquired a legal right to displace minority shareholders from the offeree company, if he carried out a takeover bid before exercising his right of squeeze-out and has in the hands at least 95% of the shares and voting rights of the offeree company. The analysis of the legal situation and of the historical development of squeeze-out regulation clearly shows that in squeeze-out transactions in Slovakia are a part of regulation governs the behaviour of entities on capital markets including the exit of joint-stock companies from the regulated market in close connection with the right of takeover, respectively with the institute of takeover bids. Squeeze-out has become effective since 1 January 2006 and only in the case of joint-stock companies whose shares are admitted on the Bratislava Stock Exchange (hereinafter "BSE") or on other regulated market in other member states of the EU (article 114 (1 – 4) of the SA). Until 2006, the Slovak legal norms did not recognize the concept of squeeze-out, and de facto did not even allow the displacement of minority shareholders through the buy-out right on the part of the majority shareholder. In case of non-public joint stock companies, the buy-out rights in accordance with the Slovak squeeze-out and business regulations cannot be realized at all.

3.2. Evaluation of the recent legal regulation – background of current legal state

From the analysis of the current state of the Slovak legal framework it is obvious that squeeze-out as a legal element is incorporated into the Slovak legislation as a buy-out right in accordance with the EU directive. Squeeze-out is directly governed by the section 118i of the SA that is the primary regulation of the squeeze-out in Slovakia.

Specifically, it follows from the paragraphs 1 to 4 of the section 118i of the SA that squeeze-out is unequivocally a conditional right of the majority shareholder (an offeror) since he has the right to require all the holders of remaining shares of the offeree company to transfer those shares to him for a fair consideration (i.e. at a fair price), if he owns shares whose total nominal value is not less than 95% of the capital carrying voting rights and not less than 95% of the voting rights in the offeree company, he exercises the right of squeeze-out within 3 months since the day of his takeover bid (obligatory or voluntary), which was neither partial nor conditioned, and finally if he acts based on a prior approval issued by the National Bank of Slovakia, a leading institution that performs permitting and supervising activities of all subjects involved in squeeze-out transactions. On 1 January 2019 took the effect the last amendment of the primary regulation, which currently governs the buy-out right in Slovakia, namely the Act no. 373/2018 Coll. amending and supplementing the Act no. 371/2014 Coll. on resolution in the financial market as amended. Particularly, the given amendment has mainly changed the previously applicable regime of change of ownership of shares between the majority shareholder and minority shareholders. From the paragraph 6 of the section 118i of the SA it follows that provided all conditions defined by law are met, the right of squeeze-out is considered to have been exercised by a decision of the general meeting of the offeree company on the transition of shares of all remaining shareholders to the majority shareholder. The general aim of the mentioned amendment is to simplify the process of squeeze-out while accepting the conditions of a fair compensation of minority shareholders. Specifically, in the explanatory memorandum to the draft of the amendment was stated that the amendment should be an adjustment aimed at simplifying the squeeze-out process by changing the transfer process of ownership rights to shares from minority shareholders to the majority shareholder (that time the transfer regime in a contractual form with the participation of both parties). The memorandum suggested to switch to the transition system (based on the decision of the general meeting of the offeree company), as the current wording of the SA (in that time) had not allowed for the effective exercise of the squeeze-out right in favour of the majority shareholder who had a majority stake exceeding 95% in a joint stock company. The explanatory memorandum further stated that this situation (before the amendment) had complicated the operation of joint-stock companies with a majority shareholder, whose share in the share capital and voting rights exceeded 95% and had increased operating costs of such companies. In addition, the other reason for adopting the current wording of the regulation was that the trading of shares of these companies on the BSE suffered from a lack of liquidity, which ultimately also negatively affected the price of shares held by minority shareholders. (Explanatory memorandum to the Act no. 371/2014 Coll. on resolution in the financial market as amended) The current regulation is also a response to the fact that a significant part of companies whose shares are traded on the BSE come from the privatization process in the 1990s, while a significant part of the shares are in the hands of small shareholders, in the worst case their heirs as successors to property rights, while the property rights to these shares in most cases did not go through the inheritance process (they are in the hands of "dead souls"). The regulation is also aimed at enabling minority shaleholders to monetize shares that are otherwise illiquid (characteristic for Slovakia). For instance, the squeeze-out transactions that began before the current wording of the law were not successfully finished for long time due to the complicated process of transfer of ownership to shares from minority shareholders to the majority shareholder and law conditions that related to this process. According to the National Bank of Slovakia, until 2018 (i.e., for 13 years), only 7 legal or natural persons as the majority shareholders asked and gained the permission from the National Bank of Slovakia to exercise their squeeze-out rights. Since 2019, the Bank has issued permission for squeeze-out in case of 3 companies.

For comparison, in Czechia, in the country historically and economically the closest to Slovakia, the procedural side of squeezing out minority shareholders has been regulated in this way practically since the transposition of the EU directive on takeover bids into the Czech regulation, i.e., 2006. In case of Slovakia, the Czech legislation is taken as an example of good practice.

3.3. Quantitative and qualitative legal conditions of squeeze-out

To carry out a squeeze-out in the Slovakia, the majority shareholder is obliged to meet quantitative and qualitative conditions. The basic quantitative criterion is the marginal share of the majority shareholder in the share capital and voting rights. According to the Slovak regulation, the majority shareholder must hold at least 95% of shares and voting rights of the offeree company (118i (1) of the SA), i.e., 5% above the threshold defined in the EU directive. For comparison, in the following table the critical marginal share of the majority shareholder in the share capital and voting rights in other states of the EU and in the selected countries outside the EU in the case of squeeze-out are presented. Based on data in the table, it is obvious that Slovakia belongs among countries with the most strictness quantitative conditions, and thus, at least in this respect, to the countries with a greater minority shareholder protection.

Minimum share in the nominal value of the shares of the target (offeree) company and related minimum share in its voting rights			
90%	**95%**	**98%**	**Specific**
Albania, Australia, Austria, Czechia, Denmark, Estonia, Finland, France, Honk-Kong, Hungary, Norway, Poland, Portugal, Romania, Serbia, Singapore, Slovenia, Spain, Sweden, United Kingdom, USA	Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Germany, Italy, Lithuania, Latvia, Luxembourg, Netherlands, Russia, Slovakia	Turkey	Switzerland (90% in the case of corporate squeeze-out, 98% in case of squeeze out that follows the take-over bid)

Table 1: Minimum share in the nominal value of the shares of the target (offeree) company and the related minimum share in its voting rights (overview of selected countries) (Source: own collaboration based on the analysis of national regulations of the squeeze-out rights)

Referring to the qualitative criteria of squeeze-out, the findings indicate following:

- the right of squeeze-out may be exercise only in the case of joint-stock companies whose shares are publicly traded on the BSE;
- the right of squeeze-out is a conditional right since its tied to a takeover bid; the implementation of a takeover bid, which cannot be either partial or conditional, is a prerequisite for exercising the right (the takeover bid is “condition sine qua non”);
- the approval process by the National Bank of Slovakia and its supervision can be considered an important guarantee of the legal course of squeeze-out, since the Bank also examines the correctness of the valuation approaches used in the determining a fair price for the shares of minority shareholders including the final value of compensation;
- the obligation of the majority shareholder to create a financial security in the amount of compensation for the shares of majority shareholders and its deposit in the hands of the authorized person, before submitting the application for consent to exercise the right of squeeze-out to the National Bank of Slovakia;

- the preserved existence of legal means protecting minority shareholders, namely the right to file a petition for the invalidity of the decision of the general meeting of the offeree company on the transfer of shares of minority shareholders to the majority shareholder in accordance with the paragraph 1 of the section 131 of the Act no. 513/1991 Coll. on commercial code as amended and the right to sue the majority shareholder in connection with the inadequacy of consideration for the shares of minority shareholders; in the first case, the disposition rights of the majority shareholder on the shares of minority shareholders will be limited – he will not be able to use the shares as collateral or transfer them to other persons until the court decides (a legal mean of protecting with the impact on the process of squeeze-out and its termination); in the latter case, only the question of adjusting the price of the consideration offered by the majority shareholder and requested by the minority shareholder will be disputed without affecting the change of ownership to the shares of minority shareholders (a legal mean of protecting without the impact on the process of squeeze-out and its termination);
- the way of determining the value of consideration for the shares of minority shareholders (discussed separately in the following section).

4. ANALYSIS OF DETERMINING A FAIR VALUE FOR THE SHARES OF MINORITY SHAREHOLDERS IN THE SLOVAK REPUBLIC

Determining a fair price is a crucial element in the success of squeeze-out transactions. (Sedlakova, et al., 2019) The paragraph 10 of the section 118i of the SA states that in the case of squeeze-out, the consideration offered to minority shareholders for their shares must by appropriate to the market value of the shares of the offeree company. And since, the squeeze-out right is conditioned, the adequacy of the consideration must be assessed in the context of the takeover bid, which squeeze-out, following the regulation in force, must be preceded. A legal fiction of a fair price as an appropriate consideration in case of squeeze-out that follows a voluntary takeover bid, is met provided that the offeror through this takeover bid and this offered price acquired at least 90% of shares carrying voting rights that were the subject of the voluntary takeover bid. (118i (10) of the SA). If the offeror gained this marginal number of shares, that price may be applied also in squeeze-out as a fair consideration for the shares of rest minority shareholders. Otherwise, a fair price must be in accordance with a fair price determined in case of squeeze-out that follows a mandatory takeover bid. The determination of the redemption price for the shares of minority shareholders in the case of squeeze-out that follows a mandatory takeover bid is the same as in the case of this bid, i.e., according with the paragraphs 4 to 6 of the section 118g of the SA, the consideration is given by an expert opinion, who is appointed by the National Bank of Slovakia from the List of experts kept by the Ministry of Justice of the Slovak Republic. An expert opinion shall prove a fair price for shares in squeeze-out if an expert applies two valuation approaches at the same time (asset-based method, business method) in accordance with the appendix no. 16 Determination of general value to determine an adequate consideration for shares in accordance with the Act no. 566/2001 Coll. on securities and investment services of the Decree of the Ministry of Justice no. 492/2004 Coll. on determination the general assets value as amended. It is thereby obvious that the legal existence of the right of squeeze-out in the Slovak legislative has impacted also on setting the rules for valuation of the offeree company for that reason. According to these rules as well as the protection of claims of minority shareholders on a fair compensation, an expert ultimately must comply with a principle of substance, i.e., to consider the offeree company as an open system with all specificities that effect internal and external environments of the offeree company and vice versa. The methodology of valuation itself is based on the idea of an absolute indemnity for investments of minority shareholders, since squeezing them out is a forced loss of their property rights.

Therefore, it is logical that the methodology implies an obligation for the expert to apply going concern approach. Applying of both methods for determining a fair price for the squeezed shares concurrently, while the highest one shall be accounted as a fair compensation, it is considered as another legal element of guarantee of minority shareholders in the Slovak regulation. In the case of closer look on both methods that shall be applied in business valuation in the case of squeeze-out is considered not only the value of assets of the offeree company, but also the importance of the investment that the minority shareholder is losing, and the majority shareholder is acquiring. Except other, according to the paragraph 6 of the section 118g of the SA, the official consideration offered to minority shareholders for their shares in squeeze-out cannot be lower than the reference values (prices) at the same time. The reference values in general consider the market price of shares, the net accounting value of assets, and the general value of the company:

- the highest price, which the offeror (or persons acting in concern with him) paid for shares of the offeree company in the last 12 months before a takeover bid became mandatory;
- the average market price of shares (with given ISIN) for last 12 months before a takeover bid became mandatory;
- the net value of assets per share including the value of intangible assets in accordance with the information reported in the last audited financial statements of the offeree company before a takeover bid became mandatory;
- the general value of shares stipulated in the expert opinion, i.e., the general value of the offeree company per share.

5. OPINION CONFRONTATION OF THE AUTHOR ON THE RECENT SQUEEZE-OUT REGULATION AND PRACTICE

The current amendment to the squeeze-out is more flexible in its wording, but the degree of use of this institute in the conditions of Slovakia is still primarily depend on the number of share issues placed on the BSE. However, as is known, the capitalization on this market is relatively low, as well the number of the share issues. On the other hand, the current squeeze-out regulation is a promising prospect of "withdrawing" illiquid shares from the market, especially those in the hands of small investors since the time of coupon privatization and a legitimate means of delisting companies. However, it is also necessary to point out certain pitfalls that have emerged in the relatively short period of existence of the current squeeze-out regulation, or they can be expected to be the subject of expert discussion, or even judicial objections. If the existence of squeeze-out as a legitimate legal means to displace a minority shareholder is accepted, the question of its fairness remains "unanswered" if the squeezed minority shareholder is to be a shareholder investing through collective investment schemes (collective investment funds and pension saving investment funds). So far, such an event has not occurred in Slovakia. Regardless of the still absenting empirical knowledge in the case of our county, we identify with the opinion of e.g., Cunderlik (2019), Uzakova (2012). They hold an opinion that this way of investing, inter alia, is the special public interest of the government, which is declared by various advantages which could offset conflicting interests of the majority shareholder – and thus exclude from the right of squeeze-out shares that are held in these funds. However, in order not to completely impair the right of squeeze-out in the case of shares that are the subject of collective investing, it would be appropriate to set a percentage of co-owned shares in one collective investment and pension savings entity at which the majority shareholder could be able to exercise his buyout right. Another problem, but this time directly from practice, is that the transfer of shares to the majority shareholder through squeeze-out is a conditional right in Slovakia and is therefore strictly feasible and applicable only in connection with a takeover bid by the majority shareholder (or a person acting in accordance with him). There are companies, whose share are placed on the BSE, in which the majority shareholders had acquired

a controlling interest (according to Slovak law at least 33%) before the right of squeeze-out was introduced in the Slovak legislation. It follows from the regulation that the takeover bid must either immediately follow the acquisition of a controlling interest (under the Slovak law at least 33%) and then it is a mandatory takeover bid, or it aims to acquire a controlling interest (and therefore at least 33%) and then it is a voluntary takeover bid. From the written is follows that a voluntary takeover bid can de facto be used only for the purpose of acquiring a controlling interest and not for the purpose of increasing the controlling interest in the company. The current regulation that the squeeze-out can take place only after a voluntary takeover bid implies that the voluntary takeover bid can be announced only by a shareholder who does not have more than 33% of the shares of the target company, but at the same time only the shareholder who own 95% of the capital share may exercise the squeeze-out right whereby these provisions of the SA are contradicting. This practical problem occurred in the case of Slovnaft, a.s., whose majority shareholder (MOL Nyrt., Budapest) has exercised the right of squeeze-out. Currently, minority shareholders have filed a collective action to court against the illegality of the decision of the general meeting of the offeree company on the transfer of shares of minority shareholders to the majority shareholder.

6. CONCLUSION

The institute of squeeze-out is already a common and legitimate legal means for implementing changes in the ownership structure of publicly traded joint-stock companies. The existing critical views on this institute point out mainly the contradiction between minority shareholders and the general principles of the protection of property and minority rights. Regarding the squeeze-out in the conditions of Slovakia, especially from a legal and economic perspective, the legal status analysis shows that the right of squeeze-out is a legitimate right of the majority shareholder, which is strictly conditional and in line with the minimum requirements set by the EU directive. At the same time, it was concluded that squeeze-out cannot be examined separately and considered for its economic nature without examining the environment of its implementation, i.e., capital market and its legal legitimacy. In accepting these basic conditions, the right of squeeze-out is considered to be an ex-ante means addressing divergences between the majority shareholder and minority shareholders. An analysis of the squeeze-out regulation has shown that the basic regulation also has an impact on other legal regulations, including the regulation of determining the appropriate consideration for the shares of minority shareholders. At the same time, it has been found the use of two valuation methods and acceptance of other critical share values create a scope for objectifying the compensation for minority shareholders. On the other hand, we have pointed out the shortcomings of the current legislation, in particular the right of squeeze-out in the case of small shareholders who own shares through collective investment schemes, and the legal discrepancy between the content of the definition of voluntary takeover bid (as a prerequisite for squeeze-out) and the Slovak practice, since there are companies on the BSE in which the majority shareholder acquired a controlling interest long before the squeeze-out regulation came into force. This deadlock does not allow majority shareholder to make a voluntary takeover bid, and thereby squeeze-out may be seen as an unjustified deprivation of property and other rights of minority shareholders from the legal point of view.

ACKNOWLEDGEMENT: *This paper is an output of the science project VEGA 1/0210/19 – Research of innovative attributes of quantitative and qualitative fundaments of the opportunistic profit modelling.*

LITERATURE:

1. Bates, T. W., Michael L. Lemmon, M. L, Linck, J. S. (2006). Shareholder wealth effects and bid negotiation in freeze-out deals: are minority shareholders left out in the cold? *Journal of Financial Economics,* 81, p. 681-708.
2. Crocia, E., Ehrhardt, O., Nowak, E. (2013). The corporate governance endgame – an economic analysis of minority squeeze-out regulation in Germany. Retrieved 25.6.2021 form http://dx.doi.org/10.2139/ssrn.2080745
3. Directive 2004/25/EC of the European Parliament and of the Council of 21 April 2004 on takeover bids. Retrieved 9.7.2021 from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004L0025
4. Dollinger, M. (2006). *The "fair" squeeze-out compensation: Die angemessene Barabfindung für Minderheitsgesellschafter in einem Squeeze-Out.* Norderstedt: Diplomica Verlag, p. 68.
5. Follert, F. (2020). Squeeze-out and business valuation in Germany – a law and economics analysis of judical decision-making. *Accounting, economics, and law: a convivium,* 2020.
6. Follert, F., Herbener, J. M., Olbrich, M., Rapp, D. J. (2018). Agree or disagree? On the role of negotiations for the valuation of business enterprises. *The Quarterly Journal of Austrian Economics*, 21(4), p. 315-338.
7. Heckova, J., Chapcakava, A., (2009). Explikácia významu inštitútu squeeze-out v podmienkach Slovenskej republiky. *Ekonomický časopis,* 57(5), p. 424-444.
8. Hopt, K. J. (2001). *Modern company law problems: a European perspective. Keynote speech*. Retrieved 24.06.2021 from: https://www.oecd.org/daf/ca/corporategovernanceprinciples/1857275.pdf
9. Huddart, S. (1993). The effect of a large shareholder on corporate value. *Management Science*, 39(11), p. 1407-1421.
10. Chen, C., Zhang, W., Wan, W. Y. (2018). Regulating squeeze-out techniques by controlling shareholders: the divergence between Hong Kong and Singapore. *Journal of corporate law studies*, 18(1), p. 185-216.
11. Chen, S. (2020). The statutory squeeze-out mechanism – a law and economics perspective. Retrieved 1.7.2021 from https://www.researchgate.net/publication/341049599_The_Statutory_Squeeze-Out_Mechanism_-_A_Law_and_Economics_Perspective/citations.
12. Kaisanlahti, T. (2007). When is a tender price fair in a squeeze-out? *European Business Organization Law Review*, 8, p. 497-519
13. Langebucher, K. (2011). Aktien- und Kapitalmarktrecht. 2. Auflage. München: Verlag C. H. Beck, 2011. 423 p.
14. Matschke, M. J. (2013). Referenzmodelle zur Bestimmung der angemessenen Abfindung von Minderheitskapitalgesellschaftern – Günter Sieben zum 80. Geburtstag. *Betriebswirtschaftliche Forschung und Praxis*, 65(1), p.14-54.
15. Miliutis, F., (2013). Fair price in squeeze-out transactions. *Societal Studies*, 5(3), p. 769-792.
16. Noodezh, H. R., Ali Amiri, A., Moghimi, S. (2015). Investigation of the relationship between shareholders conflict over dividend policy and accounting conservatism in Tehran Stock Exchange. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(3), p. 108-115.
17. O'Neal, F. H. (1961). *Arrangements which protect minority shareholders against squeeze-outs.* Retrieved 25.6.2021 from https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=5673&context=faculty_scholarship#:~:text=Most%20prominent%20among%20the%20devices,shareholder%20and%20di%2D%20rector%20action.

18. Pokorná, J. (2004). Squeeze-out: ochrana menšinových akcionářů nebo efektivita činnosti akciové společnosti? *Právní fórum: český právnický měsíčník,* 1(6), p. 237-239.
19. Sedlakova, I., Kramarova, K., Kollar, B., Havelkova, A. (2020). Vybrané aspekty práva výkupu s dôrazom na slovenskú republiku v kontexte určenia všeobecnej hodnoty akcií – I. časť. *Podniková ekonomika a manažment,* 4(2020), p. 32-48.
20. Sedlakova, I., Kramarova, K., Vagner, L. (2019). Discussion of theoretical-practical aspects of squeeze-out. *Littera Scripta*, 12(1), p. 1-20.
21. Uzaková, V. (2012). Constitutional and Legal Aspects of Squeeze-out of Minority Shareholders. In *Míľniky práva v stredoeurópskom priestore 2012: Zborník príspevkov z medzinárodnej konferencie* (p. 962-970). PraF UK.
22. Van der Elst, C. F., Van den Steen, L. (2007). Opportunities in the M&A aftermarket: squeezing out and selling out. In G. Gregoriou, & L. Renneboog (Eds.), *Corporate Governance and Regulatory Impact on Mergers and Acquisitions: Research and Analysis on Activity Worldwide Since 1990* (p. 191-242). Elsevier.
23. Van der Elst, C. F., Van Den Steen, L. (2009). Balancing the interest of minority and majority shareholders: a comparative analysis of squeeze-out and sell-out rights. *European company and financial law review*, 6(4), p. 391-439.
24. Vládny návrh zákona, ktorým sa mení a dopĺňa zákon č. 371/2014 Z. z. o riešení krízových situácií na finančnom trhu a o zmene a doplnení niektorých zákonov v znení neskorších predpisov (dôvodová správa). Retrieved 15.7.2021 from https://www.nrsr.sk/web/Default.aspx?sid=zakony/zakon&MasterID=6986
25. Vos, T. (2018). Baby, it's cold outside ...'– a comparative and economic analysis of freeze-outs of minority shareholders. Retrieved 29.6.2021 from https://lirias.kuleuven.be
26. Vyhláška Ministerstva spravodlivosti Slovenskej republiky č. 492/2004 Z. z. o stanovení všeobecnej hodnoty hodnoty majetku v znení neskorších predpisov. Retrieved 20.7.2021 from https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2004/492/
27. Zákon č. 209/2007 Z. z., ktorým sa mení a dopĺňa zákon č. 566/2001 Z. z. o cenných papieroch a investičných službách a o zmene a doplnení niektorých zákonov (zákon o cenných papieroch) v znení neskorších predpisov a o zmene a doplnení niektorých zákonov. Retrieved 7.7.2021 from https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2007/209/
28. Zákon č. 373/2018 Z. z., ktorým sa mení a dopĺňa zákon č. 371/2014 Z. z. o riešení krízových situácií na finančnom trhu a o zmene a doplnení niektorých zákonov v znení neskorších predpisov a ktorým sa menia a dopĺňajú niektoré zákony. Retrieved 8.7.2021 from https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2018/373/20190101.html
29. Zákon č. 566/2001 Z. z. o cenných papieroch a investičných službách a o zmene a doplnení niektorých zákonov. Retrieved 7.7.2021 from https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2001/566/
30. Zákon č. 644/2006 Z. z., ktorým sa mení a dopĺňa zákon č. 483/2001 Z. z. o bankách a o zmene a doplnení niektorých zákonov v znení neskorších predpisov. Retrieved 7.7.2021 from https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2006/644/

EXPANDING THE APPLICATION OF CLOUD AND MOBILE TECHNOLOGIES FOR INFORMATION EXCHANGE IN THE USE OF E-LEARNING MANAGEMENT SYSTEMS

Arzu Huseynova
Institute for Scientific Research on Economic Reforms,
H. Zardabi str.88, AZ1011, Baku, Azerbaijan
arzu.huseynova@economy.gov.az

Ophelya Mazanova
Azerbaijan State University of Economics (UNEC)
Istiqlaliyyat str.6, AZ1001, Baku, Azerbaijan
ofelya.mazanova@unec.edu.az

ABSTRACT

During the pandemic, the ability of specialists to acquire the necessary knowledge in the cloud has greatly expanded. It can be said that the technology of creating and disseminating new innovative knowledge has made it necessary to start the widespread application of innovative educational ideas in the education system. Because the development of the technological infrastructure of each country is determined by the number of specialized specialists. In order to create electronic resources, first of all, it is necessary to adopt international standards and include them in the curriculum of both higher and secondary education institutions in order to expand the use of cloud and mobile technologies in the educational process. The problem of transition to e-learning and the impact of technological processes on the education system have been systematically studied in Azerbaijan. In conclusion, the results having theoretical and practical importance are shown as well as the conclusions and recommendations.

Keywords: *Innovative technologies, The education system, E-learning, Higher education, Cloud and mobile technologies*

1. INTRODUCTION

Known that the spread of the coronavirus disease all around the world in 2020, changed the traditional rules in all fields of economy, as well as in the field of education, and stimulated innovation. The extremal situation created by the pandemic and war has once again proved the importance of distance education in the higher education system. Currently, we observe a rapid transition of the teaching process from traditional to online in all forms of education, and there is no doubt that this process will become more widespread. As seen, the development impact of innovative technologies in various areas of industry, especially education, is one of the most actual problems of our time. The developing process of technological innovations increases rapidly. Before the mastering of one, the other is produced. Therefore, people are required to be agile. In the current transition process, the emergence of innovative technologies affects all areas of industry, as well as the education sector. Today, the issue of reforms related to the application of technological innovations in the higher education system is especially important. The main goal is to take advantage of the constructive opportunities created by e-government system technologies in the higher education system and to achieve their wide and safe application in the field of education. Pandemic necessitates the widespread usage of e-government systems in education, systematic development, and the usage of training information resources. In higher education, the transition of teachers to distance education is realized. Diploma defenses, development of various internal documents through electronic management systems, etc. are carried out in this way. At present, educational institutions all over the world carry out online and offline training through various e-learning management

systems. The creation of various virtual education platforms for the management of training program will accelerate the conduct of online, offline, hybrid training in real-time. Not only training but also the process of electronic management of students and teachers is going on here. Increasing demand for qualified personnel working with these systems, development of electronic resources for teaching and learning, and support for synchronous and asynchronous interaction ratings of teachers are on the agenda. These factors make it important and relevant to study and analyze the impact of education on the economy. While innovative technologies in the education field have been studied by a number of researchers in Azerbaijan, we should note that the application of innovative technologies in higher education, the usage level of electronic resources, and the study of its main directions of development have been neglected. The deepening of the usage of the innovative technologies in the education field in our country, the identification, and solution of existing problems in this area to develop the use of electronic resources emerges as an important factor.

2. RESEARCH AND ANALYSIS OF E-MANAGEMENT SYSTEMS

The second chapter investigates the analysis of e-menecment systems, e-learning technologies in the higher education system of Azerbaijan and the methods of their evaluation, and the impact of technological innovations on the teaching and learning process. Comparing the social, political, economic factors influencing the development of e-learning in higher education institutions, the factors influencing the activity of higher education institutions regardless of their activities were identified. Known that the two main functions of universities - specialist training and research implementation, reflect the linear model of innovative development of higher education. The study presents the analysis of e-learning usage in Azerbaijani universities and methods for assessing their economic efficiency. Thus, an inquiry was prepared to analyze e-learning, traditional learning and mixed learning. The usage level of electronic means in the learning process was analyzed on the basis of a inquiry. Conducting trainings on the basis of information resources in the process of e-learning increases the creative activity of students. The research method of training is used in the training process based on information resources. The essence of the research method of training - the teacher together with the students forms a problem that takes some time to solve, the teacher does not tell the students knowledge, students acquire knowledge independently by comparing the answers found in the process of problem research, the teacher's activity is focused on operational management of the problem. The teaching process is characterized by high intensity, accompanied by a high interest in learning, the acquired knowledge is distinguished by its authenticity, depth and robustness. The effectiveness of training on the basis of information resources depends on the quality and quantity of resources and information technologies used by teachers and students. Training types were also analyzed in the dissertation.

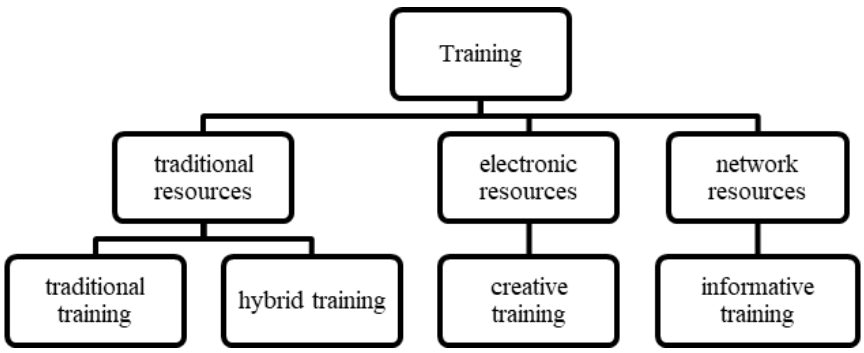


Figure 1: Comparison of training types
(Source: Compiled by the author)

Thus, a questionnaire was prepared to analyze e-learning, traditional training and hybrid training. The usage level of electronic means in the training process was analyzed on the basis of a questionnaire. The advantages of real-time, online, offline, and hybrid training in the education system have been demonstrated. A new model has been introduced to evaluate the survey results. The advantage of this model is that the usage of electronic resources in higher education has been studied in detail, the analysis of regression options confirms the existence of a linear relationship between the variables. Here, the degree of importance of each of the qualitative characteristics that can affect the outcome sign and factor indices has been determined. A new model has been proposed to evaluate the inquiry results. The advantage of the model is that the utilization quality of electronic resources has been studied in detail. Analysis of regression variants verified the existence of a linear relationship between the variables. The importance degree of each qualitative characteristics affecting the result prediction and factor indices has been determined. SWOT and PEST analysis methods were used in the processing of the inquiry, the current situation on the use of e-learning system by teachers and students was presented. A regression model was implemented to calculate the effect of the inquiry results on each other. The results of electronic resources on groups and the values of the factor indices were provided.

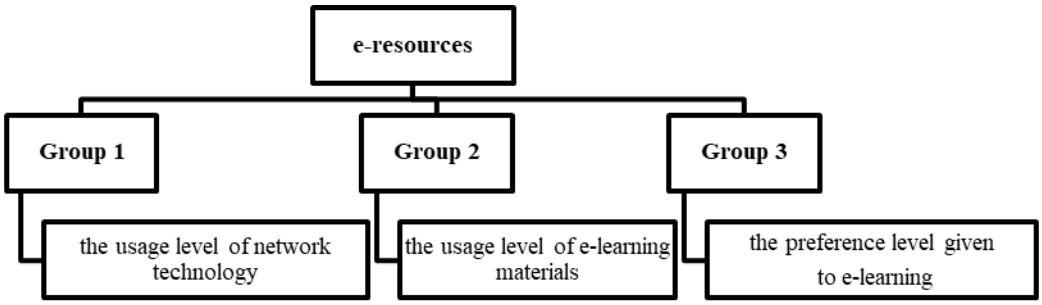


Figure 2: Group e-resources
(Source: Compiled by the author)

As seen, the values of the result indication and factor indices for the electronic resources located in group 1 are high. Since, in the "World Economic Forum Report" , Azerbaijan ranked 57th in the world according to the Network Readiness Index 2016**.** Thus, 99 percent of the Azerbaijani population is a mobile user**.** The values of result indication is lower than the factor index values of electronic resources in group 2**.** This shows fewest of specialists working with electronic resources. E-resources for education do not satisfy the requirements for the transition to e-learning. We need innovative staff, especially creative staff in the education field. Finally, the values of the usage level parameters in Group 3 are very low. Because there exist few electronic resources in the Azerbaijani language. In Azerbaijan, there has not developed any methodological aids for the instructions of electronic resources usage, and there doesn't exist normative legal document in this area. "On Education" in our country on February 5, 2021" However, this issue is not reflected in this law. However, in the current pandemic, the e-learning resources being few for conducting training with electronic systems is noticeable. One of the factors affecting the quality of e-learning is the development of high-quality and safe Azerbaijani-language e-resources. As a result of the regression model based on the survey, the problem of low-level usage of teachers from electronic resources was revealed. PEST analysis was performed to investigate the cause of the problem. The strategic conditions created by the external environment, which affect the low-level usage of e-resources by teachers of higher education institutions, were assessed. The regression equation in the table shows that there exists a linear correlation between the considered indicators of the economic system.

Factor	Linear regression equation	Coeffi cient of deter mination	R	Norma lized R square	Durbin-Watson coefficient	Std. Error of the Estimate
Tercher-e	$Y_i = 5{,}1851 + 0{,}7701X_i$	$R^2 = 0{,}6783$	0.817	0.649	DW=1,98	4.707
Student-i	$Y_i = 3.0584 + 0.6547X_i$	$R^2 = 0{,}5013$	0.700	0.473	DW=1,58	5.780
Pupil	$Y_i = 0{,}1786 + 0{,}6494Xi$	$R^2 = 0{,}7199$	0.848	0.704	DW=1,89	3.514

Table 1: The result of the analysis of the regression equation

The average values showing the usage level of e-resources by factor groups were calculated and a diagram was constructed. MS Excel software was used to perform regression calculations. In the course of the research, SWOT analysis has been used to study and evaluate the real situation, development prospects of the usage of innovative technologies in the education system, and PEST analysis was conducted to analyze the external environment and assess the strategic conditions created by it. The transition to electronic systems and the strengths and weaknesses that support these processes, the existing opportunities and threats were identified according to the evaluations. The effectiveness of the high usage level of electronic resources is evaluated by factors such as time savings, reduction of transport costs, prevention of environmental pollution. Existing problems of innovative technologies in the processes of its production, and application in the spheres of education, science were studied. Also, the problem of transition to e-learning has been systematically studied in the country, it was found that a large number of web resources and software for modern education are not widely used. In today's pandemic period, the lack of electronic resources for online and offline training in the e-learning management system in higher education institutions operating in Azerbaijan is one of the important problems. In the dissertation, to stimulate the development of e-learning systems in the field of education in Azerbaijan and to solve this problem a questionnaire on studying the usage level of 20 types of e-resources by professors and teachers in two higher education institutions was prepared and analyzed. A new model for evaluating survey results has been introduced. The advantage of this model is that the quality of the electronic resource usage is studied in detail, and the importance degree of each quality feature affecting the outcome sign and factor indices is determined. A regression model of linear relations between variables has been established. Thus, a regression-correlation model on the impact of e-government systems application on the education system has been established. The analysis of the inquiry results revealed that we need personnel able to use innovative technologies. This analysis also aims to identify other indicators overshadowed in the inquiring process and to use the inquiry data in a wide range of research processes. The main object is to obtain an information technology that allows the teaching staff of the three higher education institutions to acquire new knowledge and improve their professional skills.

3. CONCLUSION

In the study, the current situation connected to these problems was analyzed and suggestions were made to eliminate the problem. Proposals for the current state based on analysis and assessments in the course of research:

- For understanding the current multidimensional educational area and ensuring the creation of the most effective electronic information resources and to use innovative technologies, a convenient strategy should be implemented in the education system.
- The presence of laws on innovations and innovative technologies in our country is important.
- To provide e-standards for next-generation technologies in e-learning activities, support for broadband effective and other emerging technology systems, accelerate the technical performance required for the development of the national e-portfolio, to implement state

support for the development of comprehensive e-learning training methodological plans is proposed.

- Development of rules on safe management of e-learning system providing real-time, online and offline training in the current pandemic in our country.
- Firstly, the adoption of international standards for the creation of electronic resources is expedient. Here, the process of creating electronic resources by management should be organized systematically.
- To include both higher and secondary education institutions in the curriculum is useful for expanding the use of the rich pedagogical potential of cloud and mobile technologies.
- Comprehensive application of LMS and LCMS systems in Azerbaijan will benefit teachers, students and pupils of higher and secondary education institutions and accelerate the transition to borderless education.
- Staff able to operate with modern technologies should be trained. For establishing a staff training system for the e-learning system to expand the national e-learning network is recommended.
- To analyze and evaluate the usage level of electronic resources in higher education institutions each academic year according to the inquiring model is expedient.
- The teachers in higher education institutions being evaluated according to the electronic resources developed by them are recommended.

Thus, by applying ICT innovations in higher education institutions of the Republic of Azerbaijan, the informatization of education and the effectiveness of the usage of the electronic system by teachers who meet the requirements of the information and knowledge society can be determined.

LITERATURE:

1. Huseynova Arzu, Mazanova Ofelya Scientific News of Azerbaijan State Economic University (ISSN 2306-8426), JEL Classification Codes O32; Q55, "Theoretical and Methodological Aspects of Innovative Technologies in the Development of Knowledge Economy", Year 1, Volume 1, January-March 2013, p.107-112.
2. Huseynova Arzu, Mazanova, Ophelya, Model evaluation of an Innovative Capital, Conference: 10th IEEE International Conference on Application of Information and Communication Technologies (AICT) Place: Baku, AZERBAIJAN Publ.: OCT 12-14, 2016, p.607-609 Web of Science.
3. Hasanova Zohra, Huseynova Arzu, Mazanova Ophelya, The state of application of electronic systems in higher Education in Azerbaijan. 37th International Scientific Conference on Economic and Social Development –"Socio Economic Problems of Sustainable Development" - Baku, 14-15 February 2019, p.528-531; Web of Science.
4. 4. Mazanova Ophelya Huseynova Arzu, Hasanova Zohra, Khudiyeva Pikaxanim, Evaluation of teachers use electronic systems in higher education. 5 th ınternatıonal conference on lıfelong educatıon and leadershıp for all ICLEL 2019 / July 09-11, 2019/ Azerbaijan State University of Economics-Baku/AZERBAIJAN, p.302-309
5. Mazanova Ophelya Huseynova Arzu, The State of Application of Electronic Education System in Azerbaijan**,** 5 th ınternatıonal conference on lıfelong educatıon and leadershıp for all ICLEL 2019 / July 09-11, 2019/ Azerbaijan State University of Economics-Baku/AZERBAIJAN, p.1247-1254

IMPACT OF BUSINESS CLIMATE ON ENTERPRISE LOCATION CHOICE IN RUSSIAN REGIONS

Natalia Davidson
Ural Federal University
Ekaterinburg, Mira Street 19, Russia
natalya.davidson@gmail.com

Kristina Artemyeva
Ural Federal University
Ekaterinburg, Mira Street 19, Russia
kris.art2015@yandex.ru

Oleg Mariev
Ural Federal University
Ekaterinburg, Mira Street 19, Russia
natalya.davidson@gmail.com

ABSTRACT

Since the development level of the regions in the world countries tends to vary, and business activity is important for the regional economic success, it is vital to understand the determinants of enterprise location choice. Namely, business climate is known to be among the factors crucial for entrepreneurs when choosing enterprise location or deciding to create a firm. The aim of our paper is to estimate the role of business climate in the enterprise location decisions and in formation of enterprises in the Russian regions. To this end, we employ the data for 76 regions of Russia covering the years 2002-2019 and use the generalized method of moments. The contribution of our paper is twofold. First, we calculate and analyze the regional economic freedom index following the methodology by Coates, Mirkina and Moorthy (2017). Second, we compare the impact of two business climate indicators on enterprise location choice, namely, the regional economic freedom index and investment potential index calculated by the Analytical Agency 'Expert RA'. While studying the role of business climate, we account for gross regional product per capita, share of urban population, human capital, road infrastructure, inflation and tax policy. The results show a positive impact of business climate on enterprise location choice in Russian regions. We conclude that institutional reforms and improvement of business environment can contribute to mitigating economic and social gaps among Russian regions and enhance economic activity in Russia. The results of our research can be useful for regional policy.

Keywords: *Business climate, Enterprise location choice, Russian regions*

1. INTRODUCTION

According to the Core–periphery (CP) model by Paul Krugman economic activities and resources are concentrated in a limited number of regions, which form the core of economic activity, while the other regions stagnate, or even regress, and these are known as the periphery (Krugman, 1991). Since the development level of the regions in the world countries tends to vary, and business activity is important for the regional economic success, it is vital to understand the determinants of enterprise location choice. Business climate is known to be among the factors crucial for entrepreneurs when choosing enterprise location or deciding to create a firm. The aim of our paper is to estimate the role of business climate in the enterprise location decisions and in formation of enterprises in the Russian regions. To this end, we employ the data for 76 regions of Russia covering the years 2002-2019 and use the generalized

method of moments. The contribution of our paper is twofold. First, we calculate and analyze the regional economic freedom index following the methodology by Coates, Mirkina and Moorthy (2017). Second, we compare the impact of two business climate indicators on enterprise location choice, namely, the regional economic freedom index and investment potential index calculated by the Analytical Agency 'Expert'. While studying the role of business climate, we account for gross regional product per capita, share of urban population, human capital, road infrastructure, inflation and tax policy. The paper is organized as follows. Section 2 is devoted to the research background. In Section 3 data and methods are discussed. Section 4 presents the results of econometric estimation. Section 5 concludes.

2. RESEARCH BACKGROUND

2.1. Economic geography and enterprise location choice

According to the economic geography literature, firms prefer to locate in the regions where they expect to make the highest profit (Combes et al., 2008). Extant literature demonstrates the relevance of good location for prosperity of the company (Melo et al., 2009). The objective of location decision is to maximize the benefit of an enterprise (Heizer and Barry, 2016). On the other hand, location decision requires choosing a site for a business to minimize the cost of operations (Krugman, 1991a). As profit of the firm depends on two main factors: revenue and costs, it can be calculated as follows:

$$\pi_{ct} = p_{ct} * Y_{ct} - \omega_{ct} * L_{ct} - r_{ct} * K_{ct}, \qquad (1)$$

where Y_{ct} is the output of a representative firm located in market c at date t; p_{ct} is the price of the good produced; L_{ct} is labor, ω_{ct} is the wage rate on the local labor market; K_{ct} is other factors of production; r_{ct} is the unit cost of non-labor inputs.

Summing up, investigating the determinants of the enterprise location choice, the factors directly or indirectly reducing costs or increasing revenue should be considered. Therefore, empirical works that study location choices incorporate a set of variables capturing two main determinants of profitability: the accessibility to demand and the level of production costs (Head et al., 1999). The profitability of firms is further enhanced by increasing returns. As a result, firms that set up in a large region enjoy higher profits than those established in a small one (Coates, Mirkina and Moorthy, 2017).

- *Hypothesis 1: the size of the local economy and its level of development are fundamental factors that affect the firm location choice, since they determine the existing demand and income of the population of the local economy, which directly affects the potential profit of the firm.*

Besides, there are several factors that affect the level of local wages and therefore the firm location choice, for example, the opportunity to access a pool of workers (Brower et al., 2004; Carlton, 1983). Together with that labor market institutions or the local level of education was defined as an important indicator of the quality and concentration of human capital, as well as a factor that affects the firm location choice. A more skilled workforce increases the enterprise productivity and improves the quality of the product, and therefore profits (Chepurenko, 2012; Raposo and Do Paco, 2011). Raising the level of skills of the population and introducing specialized courses increases the likelihood that individuals will possess the knowledge and skills necessary to engage in entrepreneurship (Djankov et al., 2005).

In addition, in communities with high level of education, norms and rules are formed that promote compliance with formal norms, and a higher level of trust, so such communities may be more open to entrepreneurs and new ideas (Lee et al., 2004).

- *Hypothesis 2: human capital is a significant factor influencing the enterprise location choice. On the one hand, cheap labor reduces the cost of wages and increase profit; on the other hand, qualified personnel allows the company to increase productivity and thereby increase profits.*

Many authors emphasize ambiguous impact of unemployment on entrepreneurial activity (Fritsch and Falck, 2007). High unemployment indicates poor economic conditions and a higher risk of business failure, but also signals the availability of human resources for entrepreneurship (Barinova et al., 2018).

- *Hypothesis 3: the impact of unemployment may vary depending on the economic conditions of the local economy, but in most cases high unemployment is a disincentive to the creation of a new enterprise.*

It is also proved that government policies can both promote and negatively affect entrepreneurship (Spencer and Gomez, 2004). For example, the uncertainty and instability of public policy reduces the desire of entrepreneurs to develop long-term strategies. Moreover, high taxes increase the cost of starting a business or cost of capital thereby reducing the incentives for entrepreneurship (Djankov et al., 2010) and affecting firm location decisions (Crozet et al., 2004).

- *Hypothesis 4: inflation as a factor of general economic instability, and the tax level negatively affect firm creation.*

At the same time, the World Development Report 2009 shows that spatial inequality, and therefore the conditions for modernization and leveling in the modern world, form three basic factors that present the main barriers to spatial development and the main factors that could drive the location choice: density, distance and division. First, density is a spatial concentration of the population and economies of scale. Second, distance is an economic distance from global and intra-country markets, transport and transaction costs in general. Finally, division is institutional barriers in a broad sense. Balbontin and Hensher (2018) have reviewed the literature on firm location choice and concluded that accessibility, agglomeration, and population density are the key drivers of firm location choice.

- *Hypothesis 5: urbanization and infrastructure are significant factors in firms' location decision, since they decrease costs and therefore increase the firm potential profit.*

2.2. The role of business climate in enterprise location choice

There is a strong consensus in the literature on the positive relations between institutions and enterprise location choice (Ali et al., 2010; Boudreaux and Nikolaev, 2019). It is generally agreed that institutions (local, regional and national ones) shape the conditions in which business activities are carried out, by giving rise to various business opportunities or restraints in specific locations. Based on the results of the study by Goes (2015), 1% increase in the institutional quality leads to an increase in GDP per capita by 1.7% after 6 years.

Goes used the Fraser Institute's Economic Freedom of the World Index (EFW) as a proxy for institutional quality, which includes five subcomponents: legal system reliability, monetary stability, burden of regulation, size of government, and freedom to trade internationally. The situation in Russia is characterized by specialization on natural resources and the need to diversify the economy. However, to do this, it is necessary to improve the quality of institutions, as currently the mechanisms for property rights protection and regulating barriers to entering the market are poorly developed, due to high corruption and low transparency of regulatory bodies; business and power relations are characterized by lack of trust. According to the empirical research, investment risk associated with the institutional environment has an adverse impact on location decisions made by companies in Russia (Barinova et al., 2018; Davidson et al., 2021). Poor regulatory quality imposes significant transaction costs on businesses, and negatively impacts business start-ups, firm survival, and overall business growth (Puffer and McCarthy, 2011). Corruption as a proxy for quality of institutional development negatively affects the creation of small and medium enterprises (Golikova and Kuznetsov, 2017). As for measuring institutional quality, Baranov et al. (2015) compare 19 indexes, measuring quality of institutions in the Russian Federation and reveal that Russian regional institutions are essentially multidimensional, and therefore comparison of Russian regions in terms of their overall institutional quality could be problematic. Moreover, Yakovlev and Ivanov found that The Doing Business Index does not take into account factors important for investors – employees' level of skills, the size and growth rate of sales markets, macroeconomic stability, as well as the risks of property seizure and the safety of doing business (Pushkarev et al., 2020). Coates et al. construct regional index of economic freedom for Russia and prove that level of economic freedom in Russian regions has a positive and statistically significant association with economic growth, but if within-region inequality is high, having higher economic freedom is not enough to promote economic growth (Coates et al., 2017). Bykova and Coates modify the economic freedom index, excluding the Tax component, examine its role as one of the drivers of firm performance in Russian regions and prove that greater economic freedom significantly improves firm profitability, the success of investment opportunities, and market expectations (Bykova and Coates, 2020).

- *Hypothesis 6a: the greater the economic freedom in the region, the higher the number of established firms.*
- *Hypothesis 6b: the greater the investment potential index in the region, the higher the number of established firms.*

3. METHODS AND DATA

3.1. Data and variables

We examine an extensive sample of panel data for 76 Russian regions over the period from 2002 to 2019. We use the database collected by the International Center for the Study of Institutions and Development (ICSID), which contains annual information about various characteristics of the Russian regional economy, politics, and social development for the period 1998-2014. We supplemented this data with annual digests "Regions of Russia. Socio-economic indicators" provided by the Federal State Statistics Service (Rosstat) and Rating agency "Expert RA" data for the period from 2015 to 2019. Due to lack of data we excleded 4 regions, 3 autonomous districts and regions located in the periphery of the Russian Federation. Crimea and the city of Sevastopol are also not included, since statistics on these regions are available only starting from 2014. The variables are presented in Table 1 below.

Variable name	*Definition*	*Source*
	Dependent variable	
Firms	Number of established enterprises during a year per thousand of economically active population, amount	ICSID and Rosstat
	Variables of interest	
Investment potential	Regional investment potential[1] as a percentage of total investment potential of Russia, %	Rating agency "Expert RA"
Economic freedom	Regional index of economic freedom, score	Calculated by the authors based on Coates et al. (2017)
	Control variables	
GRP_{pc}	Gross regional product (GRP) per capita, rubles	ICSID and Rosstat
Urbanization	The percentage of total population of a region living in places defined as urban, %	ICSID and Rosstat
Graduates	Share of employed people with a university degree, %	Rosstat
Tax	Taxable capacity index: the predicted tax-to-gross domestic product ratio, %	ICSID and Rosstat
Unemployment	The unemployment rate is the number of unemployed divided by the number in the labor force, %	ICSID and Rosstat
CPI	The consumer price index (CPI): the average variation between two given periods in the prices of products consumed by households, %	ICSID and Rosstat
Roads	Density of public roads with hard pavement, km per 1,000 km^2 of a region's area.	ICSID and Rosstat
Density	Number of individuals employed per unit of land, people per km^2	Rosstat

Table 1: Variables and data sources

We constructed the regional index of economic freedom according to the methodology developed by Coates, Mirkina and Moorthy (2017). The methodology is a modified form of the Economic Freedom of North America index (Bykova and Coates, 2020). Specifically, the regional index is based on the aspects of the economy and economic policy that are under the control of the regional policymakers. That is why the regional index does not cover international trade or monetary policy since they are controlled by the national government. The index covers two aspects: Size of Government and Labor Market Freedom. The structure of the index is presented in Table 2.

1. Size of government
A. General government expenditure B. Transfers and subsidies (i) Government expenditure on subsidies (ii) Share of households receiving transfers and subsidies (iii) Share of households receiving public housing C. Government enterprises and investment (i) State enterprises investment (ii) Regional budget investment
2. Regulation
A. Labor market freedom (i) Regional minimum wage for state-owned organizations (ii) Regional minimum wage for private-owned organizations (iii) Government employment

Table 2: Components of the economic freedom index (Source: Bykova and Coates (2020))

[1] *Regional investment potential* includes regional natural resource potential, labor potential, production potential, consumer potential, infrastructure potential, innovative potential, institutional capacity, financial potential and tourism potential.

Analysis of the economic freedom index shows that in 2019 relative to the situation in 2002 a decrease from 5.49 to 5.06 in the average value of the index occured, i.e. the degree of government intervention in the regional development increased.

3.2. Empirical methodology

Since there were two variables of interest that reflect the business climate of the regions and their institutional development from different aspects, two models were estimated, with the economic freedom index and the investment potential index, respectively, based on the following equation:

$$Firms_{it} = \alpha + \beta_1 X_{it} + \beta_2 Y_{it} + \varepsilon_{it} \qquad (2)$$

where $Firms_{it}$ is the number of firms registered in a region per thousand of labor force; X_{it} is a regional index of investment potential provided by "Expert RA", or regional economic freedom index; Y_{it} is a vector of control variables.

We estimated the model using generalized method of moments to cope with endogeneity: unobserved heterogeneity, simultaneity and dynamic endogeneity (Wintoki et al., 2012). We applied Hansen J statistic to check the validity of instruments and found that instruments are suitable. The next part presents the estimation results.

4. RESULTS

Table 3 below presents estimation results for location choice models estimated using GMM. The first column contains the results with the regional investment potential (model A), and the second column contains the results with the regional economic freedom index (model B).

	Model A	*Model B*
Variables	LnFirms	LnFirms
Investment potential	0.0405**	
	(0.0164)	
Economic freedom		0.00380
		(0.0193)
lnGRPpc	*0.480***	*0.553***
	(0.146)	*(0.142)*
Urbanization	*0.00805***	0.00670**
	(0.00276)	(0.00262)
Graduates	*0.0214***	0.0201**
	(0.00814)	(0.00843)
Tax	*-0.240***	*-0.239***
	(0.0721)	*(0.0697)*
Unemployment	-0.00406	-0.00254
	(0.00646)	(0.00619)
CPI	-0.0275**	-0.0209*
	(0.0125)	(0.0121)
lnRoads	0.0929*	0.0358
	(0.0527)	(0.0472)
lnDensity	-0.0570	0.0160
	(0.0544)	(0.0448)
Constant	-3.371*	*-4.560***
	(1.744)	*(1.637)*
Observations	1,362	1,362
R-squared	0.621	0.633
Number of regions	76	76

Table 3: Estimation results for the firm location choice
*(Source: Own estimations, based on Rosstat, Expert RA and ICSID data; Standard errors are reported in parantheses, * p < 0,1, ** p < 0,05, *** p < 0,01)*

Concerning the regional business climate and institutional development, the coefficient of the regional investment potential is significant, while the impact of regional economic freedom on enterprise location choice turned out to be insignificant based on our data. These results lead to the conclusion that the regional investment potential, rather than the regional economic freedom, is a priority for the enterprise location choice. However, further research on the role of the degree of state participation on enterprise location choice is needed. Logarithm of GRP per capita has a positive effect on the enterprise location choice in both models, the coefficients are statistically significant and their values are 0.48 and 0.553. Therefore, more firms are created in wealthier regions, consistent with our hypothesis. Urbanization and the proportion of workers with a high educational level are also associated with an increase in the number of established enterprises. Roads as an indicator of regional infrastructure also affect the location choice of firms. The effect of log of roads is significant in model A, but is insignificant in model B. Several variables, as expected, have a negative impact on the enterprise formation. Taxes have a negative and significant effect in both models. CPI has a negative and statistically significant impact too. Overall, based on the results, the hypotheses are partly confirmed.

5. CONCLUSION

Significant and positive coefficient of investment potential index confirms the hypothesis of the impact of the regional business climate on the enterprise location choice. Thus, results of the study underscore the importance of business climate for economic activity in the Russian regions. At the same time, the level of regional development, measured as GRP per capita, proved to be the most important determinant of the firm location choice. Roads as an indicator of infrastructure in the regions and the share of the urban population as a driver of the agglomeration level also positively affect creation of firms. Along with that, share of employees with university degree is also associated with an increase in the number of established enterprises in a region. On the contrary, government tax policy has significant and negative effect on the firm creation, since large taxes decrease after-tax profit. In addition, we found negative impact of the inflation rate expressed by the CPI on the establishment of new firms. Overall, the results of our study show a positive contribution of high quality institutions and favorable business environment on firm creation in the regions of Russia. Thus, enhancement of business climate and promoting quality and transparancy of institutions is expected to facilitate creation of new firms. Along with this, improving the educational level, developing infrastructure and employing optimal tax policies are expected to stimulate the formation of new enterprises.

ACKNOWLEDGEMENT: *Research was supported by the grant of the Russian Science Foundation № 19-18-00262 "Empirical modelling of balanced technological and socioeconomic development in the Russian regions".*

LITERATURE:

1. Ali, F. A., Fiess, N., MacDonald, R. (2010). Do Institutions Matter for Foreign Direct Investment? *Open Economies Review*. doi: 10.1007/s11079-010-9170-4.
2. Balbontin, C., Hensher, D.A. (2018). Firm-specific and location-specific drivers of business location and relocation decisions. *Transp. Rev.* doi: 10.1080/01441647.2018.1559254.
3. Baranov, A., Malkov, E., Polishchuk, L., Rokhlits, M., Syunyaev, G. (2015). How (not) to measure Russian regional institutions. *Russian Journal of Economics,* 1(2), 154-181, doi:10.32609/0042-8736-2015-2-69-103.
4. Barinova, V., Zemtsov, S., Tsareva, Y. (2018) Entrepreneurship and institutions: Does the relationship exist at the regional level in Russia? *Voprosy Ekonomiki*. (6), 92-116. (In Russ.) doi: 10.32609/0042-8736-2018-6-92-116 .

5. Bykova, A., Coates, D. (2020). Firm performance and regional economic freedom: the case of Russia. *Post-Soviet Affairs*, 36(5-6), 395-415. doi:10.1080/1060586X.2020.1785239.
6. Brouwer, A., I. Mariotti, J. van Ommeren (2004) The firm relocation decision: an empirical investigation. *The Annals of Regional Science*, 38(2), 335–347.
7. Carlton, D. (1983) The location and employment choices of new firms: an econometric model with discrete and continuous endogenous variables. *The Review of Economics and Statistics*, 65(3), 440–449.
8. Chepurenko A. (2012). What is entrepreneurship and what entrepreneurship policy does Russia need? *Journal of the New Economic Association*, 2, 102–124.
9. Coates, D., Mirkina, I., Moorthy, V. (2017). Economic Freedom of the Russian Federation. *SSRN Journal*, 33 p. doi: 10.2139/ssrn.2969722.
10. Combes, P. P., Mayer T., Thisse, J. F. Economic geography. The integration of regions and nations. Princeton University Press, 2008.
11. Crozet, M., T. Mayer, and J.-L. Mucchielli. (2004) How do firms' agglomerate? A study of FDI in France. *Regional Science and Urban Economics*, 34, 27–54.
12. Djankov S., Ganser T., McLiesh C., Ramalho R., Shleifer A. (2010). The effect of corporate taxes on investment and entrepreneurship. *American Economic Journal: Macroeconomics*, 2(3), 31–64.
13. Djankov S., Miguel E., Qian Y., Roland G., Zhuravskaya E. (2005). Who are Russia's entrepreneurs? *Journal of the European Economic Association*, 3(2–3), 587–597.
14. Fritsch M., Falck O. (2007). New business formation by industry over space and time: A multidimensional analysis. *Regional Studies*, 41(2), 157–172.
15. Goes, C. (2015) Institutions and Growth: a GMM/IV Panel VAR Approach. *IMF Working Paper* No. 15/174. doi:10.5089/9781513555508.001.
16. Golikova, V., Kuznetsov, B. (2017). Perception of Risks Associated with Economic Sanctions: The Case of Russian Manufacturing. *Post-Soviet Affairs*, 33(1), 49–62. doi: 10.1080/1060586X.2016.1195094.
17. Head, K., Ries, J., Swenson, D. (1999) Attracting foreign manufacturing: investment promotion and agglomeration. *Regional Science and Urban Economics*, 29, 197–218.
18. Heizer, j., Barry, R. (2016). *Operations management: sustainability and supply chain management.* Global Edition, 13th Edition.
19. ICSID – International Center for the Study of Institutions and Development: data on the regions of Russia. Retrieved 16.03.2021 from https://iims.hse.ru/csid/databases.
20. Krugman, P. (1991). *Geography and trade*. London: Cambridge, MIT Press.
21. Krugman, P. (1991a). Increasing returns and economic geography. *NBER Working Paper, No 3275*. doi: 10.3386/w3275.
22. Lee, S.Y., Florida, R., Acs, Z. (2004). Creativity and entrepreneurship: A regional analysis of new firm formation. *Regional Studies*, 38(8), 879–891.
23. Melo, M.T, Nickel, S., Saldanha-da-Gama, F. (2009). Facility location and supply chain management – A review. *European Journal of Operational Research*, 196, 401– 412.
24. Puffer, S. M., McCarthy, D. J. (2011). Two Decades of Russian Business and Management Research: An Institutional Theory Perspective. The Academy of Management Perspectives, 25(2), 21-36. doi: 10.5465/amp.25.2.21.
25. Pushkarev, A., Nagieva, K., Davidson, N., Mariev, O. (2020). How does institutional environment affect innovations in russia? Beyond doing business rating. *Proceedings of the 15th European Conference on Innovation and Entrepreneurship*. Academic Conferences and Publishing International Limited. doi:10.34190/EIE.20.096.
26. Raposo M., Do Paco A. (2011). Entrepreneurship education: Relationship between education and entrepreneurial activity. Psicothema, 23(3), 453–457.

27. Regions of Russia. Socio-economic indicators, *The Federal Service for State Statistics* (Rosstat). Retrieved from 16.03.2021 https://rosstat.gov.ru/folder/210/document/13204.
28. Spencer J. W., Gómez C. (2004). The relationship among national institutional structures, economic factors, and domestic entrepreneurial activity: A multicountry study. *Journal of Business Research*, 57(10), 1098–1107.
29. Wintoki, M.B., Linck, J.S., Netter, J.M. (2012) Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 3(105), 581–606.
30. *World development report 2009: Reshaping economic geography*. Washington, DC: The World Bank. Retrieved 20.05.2021 from https://openknowledge.worldbank.org/handle/10986/5991.

THE APPLICATION OF THE NON-PARAMETRIC METHODOLOGY DEA IN THE CROATIAN BANKING SECTOR

Katerina Fotova Cikovic
University North, Croatia
kcikovic@unin.hr

Mirko Smoljic
University North, Croatia
msmoljic@unin.hr

Josko Lozic
University North, Croatia
jlozic@unin.hr

ABSTRACT

Banks are the most important financial institutions and intermediaries in any economy and they are especially important in bank-centric financial systems. In the Republic of Croatia, banks play a dominant role in the financial system, with total assets of 408,6 billion kuna and a share of almost 70% in the total assets of the financial sector in 2018. In such a bank-based financial system, the efficient and profitable operations of banks are even more important. Banking sectors impact the entire financial system and its stability, thus influencing the stability and growth of the national economy. Evaluating banks' performance is of key importance due to its strong and positive relationship with financial growth and stability. This article aims to present the leading non-parametric DEA methodology, its main application, advantages over traditional models and its limitations. Furthermore, the goal is to provide an extensive literature review, to elaborate and sublimate the findings regarding the efficiency of Croatian banks with the application of DEA and to raise awareness and knowledge of academics, practitioners and policymakers on how to measure banking efficiency. Ever since its introduction and development by Charnes et al. (1978), the application of DEA has noted continuous growth and interest from academics and practitioners all over the world. This article analyzes and presents 8 articles and researches of bank efficiency in Croatia, as well as 12 cross-country studies (which also cover the Croatian banking sector). We have based our research primarily on the search for Croatian scientists who are registered in the Croatian scientific bibliography (CROSBI), but also the Croatian and non-Croatian researchers who authored a relevant DEA-related publication regarding the Croatian banking sector. The findings indicate that most of the studies were conducted for the period between 2002-2015, while there is a lack of research regarding the efficiency of the Croatian banking sector before the 2000s and after 2017. This fact will give guidance for future research in this area and will mark future trends of DEA applications in banking efficiency measurement and efficiency evaluation in general.

Keywords: *DEA, data envelopment analysis, literature review, Croatia, banking sector, bank efficiency, relative efficiency*

1. INTRODUCTION

The banking sector plays an essential role in the economic growth and the prospects of any country and is „considered a backbone of the country's economy“ (Fotova Čiković & Cvetkoska, 2017). Taking into consideration the fact that financial systems in developing countries are bank-based, banks' performances and efficiency are crucial due to their pivotal role in the maintainance of the national financial stability (Tomičić et al., 2012).

Banks' essential intermediary function of transferring the publics' deposits and savings into business and trade shows that banks are the main channels for savings and the allocation of credit (Sufian et al., 2016). Well-functioning banking systems „exert a first-order impact on economic growth and development" (Barth et al., 2013). The assessment of bank efficiency is of key importance from both a microeconomic and a macroeconomic point of view, with a special emphasis on efficiency. Thus, efficiency is one of the most important indicators for the successful functioning of banks. It should not come as a surprise why the measurement of efficiency and performance of the banking industry, particularly in developing countries, has captivated the attention of various academics, researchers, practitioners and regulators and the interest in such research has increased substantially in recent years (Andries & Ursu, 2016; Peša et al., 2021). Over the past three decades, the global financial market and banks have been facing dramatic institutional transformations and substantial changes, respectively, due to the decline of entry barriers in the banking industry, as a result of liberalization and financial globalization, the fast development of information technology, the stricter legislation in banking (i.e. the changing macroprudential regulation and supervisory role) as well as the changes in clients' needs (Titko et al., 2014; Davidovic et al., 2019). Even though the unprecedented growth and dramatic transformations in the banking industry in developing countries are undeniable, the research and studies regarding the performance and efficiency of this industry is almost challenging (Khaksar et al., 2020). Therefore, the main goal of this article is an efficiency evaluation of the Croatian banking sector, i.e. providing an extensive literature review, elaborating and sublimating the findings regarding the efficiency of Croatian banks. Our findings will include a comparative analysis of different theoretical and empirical scientific studies regarding the Croatian banking sector, especially studies applying the DEA methodology. The DEA methodology has been increasingly popular among scholars due to the important insights it gives to the public, creditors, policymakers, bank management, stakeholders, and other academic scholars. The paper is structured as follows. Section 2 presents the DEA methodology. Section 3 gives a background on the Croatian banking sector since its foundation, while section 4 gives an overview of the application of DEA in the Croatian banking sector. Section 5 concludes this article.

2. DATA ENVELOPMENT ANALYSIS (DEA)

Data Envelopment Analysis (DEA) is one of the most powerful mathematical programming methodologies and most commonly used non-parametric frontier methodologies for evaluation and measurement of relative efficiency among homogeneous DMUs (Decision Making Units). This methodology belongs to the Multi-Criteria Decision Aid methods and is commonly used to evaluate and measure the Technical Efficiency of a group of Decision Making Units (Fotova Čiković & Cvetkoska, 2017; Thanassoulis, 2001; Tsaples & Papathanasiou, 2020). Decision Making Units (DMUs) are any type of entities that use certain inputs to produce various forms of outputs (Rakocevic & Dragasevic, 2009). DMUs can be banks, hospitals, schools, universities, supermarkets, restaurants etc. (Tsaples & Papathanasiou, 2020). Data envelopment analysis is one of the most popular methods applied in measuring the efficiency of complex entities with diverse inputs and outputs. When measuring efficiency, there are two approaches used in the existing literature: the parametric and the non-parametric approach. It has been developed by Charnes et al. (1978) following Farell (1957), who is considered to be the founder of the technical, allocative, and overall efficiency measures and the non-parametric methods for estimating efficiency. In his seminal paper, Farrell (1957) has graphically presented the three efficiency measures in a single output case (Cvetkoska & Fotova Čiković, 2021). Later on, in 1978, Charnes, Cooper and Rhodes developed the primary DEA model, the CCR model and have presented the DMUs and isoquant graphically. This model assesses the total technical efficiency and the efficient frontier created to support this model is in the form of a convex

cone. Banker et al. (1984) have developed the BCC model, to assess the pure technical efficiency. In the BCC model, the visualized efficient frontier has a form of a convex hull (Cvetkoska & Fotova Čiković, 2021). Farell (1957) has defined two components of efficiency: technical efficiency and allocative efficiency. Technical efficiency measures the ability of an entity to maximize output with the given level of inputs and is a measure of DMUs performance relative to one another, i.e. how well each analysed DMU transforms the inputs into outputs (Rakocevic & Dragasevic, 2009). On the other hand, allocative efficiency measures the entity's ability to use different inputs in an optimal ratio relative to their prices with given production technology, i.e. to make use of inputs in the optimum quantity concerning price and production technology (Primorac & Troskot, 2005). When a company is perfectly efficient and if both technical and allocative efficiency is satisfied, the overall efficiency is also achieved (Maradin et al., 2018). DEA constructs an empirical frontier of efficiency, based on the input and output data achieved by the observed DMUs. The DMU that is efficient lies at the extreme frontier, while the inefficient one lies below this frontier (Charnes et al., 1994: 5-6; Fotova Čiković & Cvetkoska, 2017). The score for technical efficiency can take values between 0 and 1. A score of 1 (100%) is assigned to the highly efficient DMUs and a score below 1 implies relative inefficiency. DEA was initially introduced as a tool for measuring the effectiveness of non-profit organisations, such as public schools and hospitals, where it is impossible to determine whether they are efficient based only on their input and output values. Later on, this method has found its application in many different sectors where the DMUs can be different private sector (through analysis of banks, private enterprises and even theme parks) (Škuflić et al., 2013; Neralić and Gardijan Kedžo, 2018). For example, Bezić et al. (2013) have used DEA to assess the efficiency of the pharmaceutical industry in EU countries; Rabar (2010) has implemented DEA to measure the operating efficiency of Croatian hospitals; Gardijan & Kojić (2012) and Gardijan & Škrinjarić (2015) have used the DEA-based investment strategy to conclude the efficiency of the Croatian stock market; Bahovec & Neralić (2001) have assessed efficiency of agricultural production; Aristovnik & Obadić (2012) have investigated the technical efficiency of secondary education in Slovenia and Croatia and Ahec Šonje et al. (2018) have investigated the efficiency of public expenditure on education in Croatia; Vitezić et al. (2016) have measured the efficiency of public health services and Lukić & Hadrović Zekić (2019) have evaluated the efficiency of trade companies in Serbia. Furthermore, DEA has been used in assessing the efficiency in the tourism industry (Cvetkoska & Barišić, 2017). DEA has become increasingly accepted and widely used in measuring efficiency in different national banking industries (Maletić et al., 2013; Yang, 2009; Pancurova et al., 2013; Naumovska & Cvetkoska, 2014; Staub et al., 2010) since it allows comparison of the relative efficiency of banks by determining the efficient banks as benchmarks and by measuring the inefficiencies in input combinations (slack variables) in other banks relative to the selected benchmark (Jemrić & Vujčić, 2002). Sari (2019) has structured a study based on 135 comparative studies encompassing the period 2008-2017 from over 30 countries. The study introduces the application of various mathematical techniques including multi-criteria decision-making methods in bank efficiency evaluation. 60 studies out of 135 have been using the DEA methodology, which proves the dominance of the DEA methodology among other quantitative methods in measuring bank efficiency. Although there have been numerous examples of the application of the bank and their branches efficiency measurement with DEA methodology ever since its introduction in 1978, this method has not been widely used in the banking sector of the Republic of Croatia up until 2005. According to Hunjak & Jakovčević (2001), this is due to some subjective reasons (such as the required supplementary education of management for the whole potential of the obtained information through the use of this method to be utilized to the full extent), but also several objective reasons resulting from its main limitation; the main condition for the method to be used is the required number of entities to be compared must be

at least three times that of the total number of inputs and outputs. Since it only makes sense for the similar entities to be compared (banks with the similar structure of activities and operating in a similar environment), and bearing in mind the number of banks operating in Croatia as well as the possible number of similarity-based bank clusters, the direct benefit of this method implementation would be hard to achieve. According to Jemrić et al. (2002), DEA could be perceived as an alternative to regression analysis. While regression analysis relies on central tendencies, DEA is based on extreme observations. The greatest advantage of this econometric frontier approach is that, unlike parametric methods, it can incorporate multiple inputs and outputs without imposing any functional form on data or making assumptions of inefficiency (Paço & Pérez, 2013). DEA presents valuable information for the bank management, interested public and academics. One of the main reasons for its popularity is that it can be used for small samples (Gardener et al., 2011). However, it should be noted that DEA has its downsides (it performs a mutual comparison of DMUs, but not their comparison with the "theoretical maximum") and should primarily be used as a diagnostic tool and it cannot transform the inefficient units into efficient (Maletić et al., 2013). Furthermore, Jemrić et al. (2002) state that the main disadvantage of DEA is the sensitivity of the frontier to extreme observations and measurement errors due to the basic assumption that random errors do not exist and that all deviations from the frontier indicate inefficiency. However, based on the article of Škuflić et al. (2013), DEA's advantages (no required knowledge of the explicit functional form linking inputs and outputs nor a priori determination of input and output weights, the characterisation of each DMU by a single result of relative efficiency, the identification of the sources and amounts of inefficiency in each input and each output and the proposition of possible improvements to inefficient DMUs based on achieved results of efficient DMUs) outweigh its limitations.

2.1. Basic DEA models

The two basic models that are most commonly used in DEA researches are the CCR and the BCC models. These models have been named by the initials of their authors. Namely, the CCR model is a Charnes-Cooper-Rhodes model, while the BCC is a Banker-Charnes-Cooper model. The main distinction between these two basic models is the built assumption. The CCR model is built on the constant-return-to-scale (CRS) assumption, whereas the BCC model focuses on the assumption of variable-return-to-scale (VRS) activities (Škuflić et al., 2013). Namely, in the CCR model, the main assumption is that there will be a proportional increase in output variables based on the input variables. This model has proven to be less effective in some industries, and therefore Banker et al. (1984) have introduced the BCC model, which is an upgrade of the CCR model and where the variable yields per range are present, meaning that the increase in the input variable does not affect changes in the output variables proportionally (Gržeta, 2020). In addition, DEA models have two possible orientations: the input or the output orientation, as an adjustment to the chosen organisational strategy. That means that a DEA model can be constructed either to minimize inputs or to maximize outputs. The input orientation focuses on reducing the input amounts as much as possible while not changing the present levels of output, while an output orientation is focused on maximizing the output levels without increasing the use of inputs (Anayiotos et al., 2010; Savić et al., 2012; Škuflić et al., 2013). A distinction in DEA models can be made through three dimensions: intermediation, profitability and production, and each dimension reveals the main areas of the bank's activity. As banks account for the most important financial intermediation, their key activity is to seek efficiency in the allocation of their resources (deposits, loans etc.). In addition, banks operate for a profit and they operate efficiently and do risk management to be profitable. Finally, the production approach views banks as a producer of products and services with the use of using labour, capital and other resources as inputs to produce various banking products and services

(deposits, loans and other services) as outputs (Novickyte et al., 2018; Maradin et al., 2018; Anayiotos et al., 2010). Considering the advantages and the disadvantages of the DEA methodology, as well as the basic DEA models and the possible model orientations, we proceed with a brief introduction to the Croatian banking sector and the extensive literature review regarding this sector with DEA thereafter.

2.2. Background of the Croatian banking sector

After gaining independence in the early 1990s, Croatia had to transform its banking system by establishing new standards of market-based banking practice (Jemrić & Vujčić, 2002). The socialist legacy has left many problems in Croatia, most of which were resolved over the years (Galac & Kraft, 2001). The former socialist countries, which were driven by central planning, were faced with „disruptive financial meltdowns", that imposed restructuring and transformation of their bank-based financial sectors. The Croatian banking market and financial sector were no exception and had to go through with these "tectonic" structural changes (Davidovic et al., 2019). According to Jovancevic (1999), the break-up of ex-Yugoslavia and thus the break up of the Yugoslavian monetary system has caused insolvency in technical terms for Croatian banks. The crucial reforms that had to be undertaken in the banking sector started in 1991 with „measures aimed at freeing banks from accumulated bad loans". At the start of its transition from socialism to capitalism in the early 1990s, Croatia had 26 state-owned banks. To promote competition, like many other transition countries, Croatia allowed relatively free entry to the banking market. By 1994, the total number of banks had reached 49, and by 1997, the total number of commercial banks reached 60. However, the relatively free entry led to a credit boom and failure of many of these new banks during the banking crisis of 1998-99 (Kraft & Galac 2007). By end-2000, the number of banks was down to 43. The entrance of foreign banks and thus, the intensification of competition caused the inevitable reduction of interest rates and prices of banking services, together with the radical change of the market and the market scene. According to Tipurić et al. (2002), the number of banks was decreasing as a result of the processes of mergers and acquisitions of individual smaller banks to large ones. During the period of 20 years (from 1990 to 2010), a lot of domestic banks also became foreign banks. At the end of 2010, there were 32 banks in Croatia. The predictions of further M&A processes has come true especially among small and medium-sized banks (Kraft, Hofler & Payne, 2002; Kraft & Galac, 2007; Tomičić et al., 2012). During the transition period, major changes in the number of banks as well as in the ownership structure of the banking sector have occurred (Stojčić, 2012). The Croatian banking sector has undergone substantial institutional transformations over the last two to three decades, becoming a „more propulsive and competitive sector" with a significant contribution to social stability and economic development (Pervan et al., 2015). The Croatian financial system today is a bank-centric continental system and banks play the vital role of transferring funds to the economy by approving loans and enabling payments. Thus, the banking sector is a pillar for the national economy and its stability, because of the important role in the financing of economic activity (Kordić & Višković, 2017). It is characterized by a very high concentration (with the five largest banks controlling over 80% of total banking assets). More than 90% of the assets in the banking sector are in foreign ownership. Banks in Italian ownership constitute almost half of the total bank assets (48.9%), while banks in Austrian ownership are second, with a share in total bank assets of 29.9% (Banks bulletin, 2019; Peša et al., 2021). Furthermore, the corporate governance of banks has a crucial role in creating investor confidence and an efficient market (Tomičić et al., 2012). Ultimately, the efficiency of Croatian banks is vital because it affects the soundness of the financial sector and the viability of the whole monetary system. This is the reason why the measurement of relative efficiency with the application of DEA methodology in the banking sector in Croatia is the main focus of this article.

3. APPLICATION OF DEA METHODOLOGY IN THE CROATIAN BANKING SECTOR

Although DEA was initially developed as a tool for measuring the efficiency of production units that produce a real output using real inputs, the method made a breakthrough in many different industries where the DMUs can be different (Cvetkoska et al., 2021; Neralić & Gardijan Kedžo, 2019). The global literature review shows that DEA has found its most crucial role in assessing bank efficiency and has been extensively applied to such researches. However, there is a limited number of studies that analyse the efficiency of banks in developing and emerging countries. Namely, Andries & Ursu (2016) explore the efficiency of the EU-27 countries; Staub, Souza and Tabak (2010) research the cost, technical and allocative efficiency for Brazilian banks in the period 2000-2007. Interestingly, even less of these studies are focused on the banks in Central and Eastern Europe (Andries & Cocris, 2010; Cvetkoska & Savić, 2017; Fotova Čiković & Cvetkoska, 2017; Naumovska & Cvetkoska, 2014; Naumovska & Cvetkoska, 2016; Grmanova & Ivanova, 2018; Efendić, 2017; Toci, 2009; Micajkova & Poposka, 2013; Repkova, 2014; Savić, Radosavljević & Ilijevski, 2012; Pavković, Cesarec & Stojanović, 2018). When browsing the CROSBI (the Croatian Scientific Bibliography) database with the keyword „DEA“, a total of 128 studies were found. On the other hand, when the keywords „DEA“ and „banking“ were used, 13 publications were found. Only 6 of them were regarding the Croatian banking sector, while the others were cross-country studies or analysing foreign banking sectors. Even though the Croatian banking sector has been thoroughly researched (with 2065 papers with the keyword „bank“ or „banking“ on CROSBI), the DEA methodology seems to be neglected by the Croatian academics and researchers. This article gives a comprehensive literature review and could serve as a stepping stone and a promotion of the DEA methodology that could lead to further empirical application of the DEA in the Croatian banking sector. An extensive review of the literature published from 1978 to 2018 regarding the Croatian market and/or written by Croatian authors has been systemized with the paper of Neralić & Gardijan Kedžo (2019), motivated by the 40th anniversary of DEA. The studies using DEA methodology to evaluate the relative efficiency of the banking sector in Croatia and their findings follow. Jemrić & Vujčić (2002) were among the first scholars to implement the DEA in the banking sector in Croatia. Their study analyses commercial banks in Croatia in the period from 1995 to 2000. They have implemented the input-oriented CCR and BCC DEA model. The results from the CCR model reflected lower bank efficiency (the average banking efficiency in 1995 was 0.445 and 0.745 in 2000) than the BCC model (0.777 in 1995 to 0.852 in 2000). They found foreign banks to be on average more efficient than domestic banks, while new banks to be more efficient than old ones. Jurčević & Mihelja Žaja (2013) have investigated efficiency among banks and insurance companies using DEA and accounting indicators. They have used the CCR and BCC output-oriented models with the intermediation approach. They have selected interest expenses, non-interest expenses, other expenses as inputs and interest incomes, non-interest incomes, and other incomes from business activity as outputs. The observed period is 2005 to 2010. Their findings show that bank efficiency has been declining since 2007 and the lowest efficiency scores are noted in 2008 (with only 10 efficient DMUs). Kordić & Višković (2018) have observed and calculated the relative efficiency of the Croatian banking sector in 2016. They have applied the input-oriented CCR and BCC models. The selected inputs are interest costs, commission and fee costs, and general and administrative costs and amortization, while the outputs are interest revenues and noninterest revenues i.e., commission and fee revenues. Their findings present that 11 out of 24 banks are efficient in 2016. However, they did not find a statistically significant difference with the ownership of the banks. Pavković, Cesarec & Stojanović (2018) have applied the CCR and BCC output-oriented models, with an intermediation approach. The observed period is 2004-2016.

They have selected deposits and total equity as inputs and loans and income from fees and commissions as outputs. Their findings suggest that the group of large banks is most efficient when using the BCC model, while medium-sized banks are most efficient when using the CCR model. They have found "small-sized banks to be the least efficient bank group in Croatia". The study of Davidovic, Uzelac & Zelenovic (2019) has provided new insights in regard to the impact of EU accession on bank efficiency. They have implemented the variable returns to scale BCC output-oriented model and A-P super-efficiency model with an intermediation approach. They have selected interest and non-interest expenses as inputs and interest and non-interest revenues as outputs. The analysed period is from 2006 to 2015. Their findings suggest the Global financial crisis harmed the Croatian banking system, with the overall efficiency dropping by about 3%. However, they found that the EU membership has influenced Croatian banks positively and that they have benefited from it through the lower interest rates for the intra-bank borrowings. Furthermore, they suggest that the EU membership has boosted their efficiency by 45%. In addition, they found the largest banks and state-owned banks to permanently be more efficient than the privately owned banks. Maradin, Olgić-Draženović & Benković (2018) focus on the Croatian banking sector with a literature review where they cite asset value, number of employees, interest and non-interest income, deposits and loans as variables that should be used in the DEA model as indicators of business success. Their findings suggest that foreign banks are on average more efficient than domestic banks; new banks are more efficient than old banks; small banks were globally efficient, but large banks appear to be locally efficient when VRS was applied. Novak & Hsu (2020) have assessed the efficiency of the Croatian banks in the period after the EU succession of Croatia in 2013 (2014 – 2018). They have used an output-oriented DEA model (CCR) to determine the efficiency of the banks in Croatia. The selected inputs are interest and non-interest revenues, while the selected outputs are interest and non-interest expenses. Their findings imply that the efficiency level of large and medium-sized banks increased from the year 2014 to 2018. The average efficiency scores in the Croatian banks from the years 2014 to 2018 were on the scale of 0.5 to 1. They conclude their study with the finding that banking efficiency in Croatia increased after Croatia joined the EU. Peša, Mate and Prvonožec (2021) have implemented DEA under VRS (variable return to scale) assumption by using different pairs of inputs and outputs in the input-oriented models on a sample of 20 commercial banks. The observed period is one year: 2019. They also apply the Kolmogorov-Smirnov test to define the selection of appropriate variables to be included in future models for evaluating bank efficiency. Their results show that the group of large banks has noted the highest efficiency results. However, their second hypothesis that deposits and loans ought to be used as key variables in the DEA model to measure the efficiency of Croatian banks wasn't confirmed. They also address the need for future research to identify significant variables which can affect bank efficiency performance. Other than the studies presented this section, the authors have also come across a few papers regarding the Croatian banking sector using other methodologies such as Fourier-flexible frontier cost function in the period from 1994-2000 (Kraft, Hofler and Payne, 2002), a stochastic-frontier analysis study for 1994 and 1995 (Kraft & Tırtıroglu, 1998), a frontier analysis for calculating calculate each Croatian bank-specific X-efficiency between 1994 and 2014 (Huljak, 2015), the Malmquist TFP index for measuring the efficiency and productivity of banks in from 2000 to 2003 (Primorac & Troskot, 2005) and the profitability model for Croatian banks by using the first-differenced GMM estimator int he period from 2002-2010 (Pervan et al., 2015).

3.1. Cross-country studies implementing the DEA methodology

Even though the Croatian banking sector has received quite impressive attention from scholars and researchers when it comes to the implementation of the DEA methodology solely for analysing the Croatian commercial banks, compared to other national banking sectors

(Cvetkoska et al., 2021), there are many more cross-country studies that analyse and measure the efficiency and performance of banking sectors, which also cover the Croatian banking sector. Grigorian and Manole (2002) have analysed the banking efficiency of 17 transition countries in the period from 1995 to 1998. They implemented the standard DEA methodology to measure the MCMY efficiency frontier with the value-added approach. They have selected labor, fixed assets and interest expenditures as inputs, while revenues, net loans and liquid assets as the first set of outputs and deposits, net loans and liquid assets as the second set of outputs. Their findings show that Croatian commercial banks produced the best outcome in terms of revenue-based index in 1997. What is most interesting about their findings is that privatization of banks does not guarantee a statistically significant improvement in efficiency of banks. Tomova (2005) has conducted a study implementing DEA for analysing the efficiency of banks in 12 countries. She performed DEA separately for a sample of banks in CEE for the period 1993-2002 and for a pooled sample of banks in CEE and selected old EU Member states (France, Portugal and Spain). The overall average efficiency for France and Portugal was unexpectedly lower in some years than that of CEE banking systems. Namely, Toci (2009) has been among the first researchers to conduct a cross-country study where he investigates the efficiency of the banking sectors of Southeastern Europe (Bulgaria, Croatia, Kosovo and Montenegro) in the period from 2002 to 2005. His study implemented both CRS and VRS models DEA models (intermediation approach) plus the Malmquist Total Factor Productivity Change Index. He has used deposits and total costs as inputs, and loans net of provisions and total revenues as outputs. His findings regarding the Croatian banking sector show that the average efficiency for the sector as a whole increased from 0.728 in 2002 to 0.834 in 2003 and remained stable thereafter. Foreign banks continued to improve their intermediation efficiency, unlike domestic banks. Anayiotos et al. (2010) implement a DEA methodology (intermediation approach) in the efficiency assessment of 125 large commercial banks from 14 emerging European countries. They provide estimates for the relative efficiency of banks before the pre-crisis boom, just before the 2008 crisis, and after the crisis. Total capital, interest expense and operating expense were chosen as inputs, while total loans, pre-tax profit and securities portfolio were chosen as outputs. They did not succeed in finding any efficiency gains for the observed banking sectors. However, what they succeeded in was the findings that efficiency results before the recent crisis were strongly linked to the host country's level of development and that foreign-owned banks were more efficient than domestic banks. Toci & Hashi (2013) have conducted a study where they employed DEA and Malmquist Index to investigate the intermediation efficiency of banks in four SEE countries: Bulgaria, Croatia, Kosovo and Montenegro in the period 2002-2005. The selected inputs are deposits and total costs while loans net of provisions and total revenues are outputs. Their findings imply a presence of large-scale inefficiencies in the Croatian banking sector. Furthermore, they found that foreign banks were more efficient than domestic banks and larger banks were found to be more efficient than small banks. Pancurova & Lyocsa (2013) analyzed a sample of 11 Central and Eastern European Countries (CEEC) over the 2005–2008 period. In their study, they supplement a cost-efficiency Data Envelopment Analysis (DEA) model with a revenue efficiency model. The intermediation approach was adopted and the inputs were total deposits and total costs, whereas total loans and other earning assets were selected as outputs. What they found was that foreign banks in CEEC are more cost-efficient but less revenue efficient than domestic banks. Tuškan & Stojanović (2016) have applied both the CCR and BCC DEA output-oriented models under the profitability approach. They have analysed a sample of 28 European banking systems in the period from 2008 to 2012. They have used ROA, ROE, and CIR (Cost to Income Ratio) indicators, as well as the DEA methodology with interest expenses and total operating expenses as inputs, and interest income and total operating income as outputs. Their results regarding the Croatian banking system show the lowest average relative efficiency in 2012, while highest in

2008 (according to the CCR model), whereas BCC-model has shown the lowest average efficiency in 2009. Nurboja & Košak (2017) have analysed and compared the efficiency of banking sectors in selected EU and non-EU countries using the SFA model approach and their findings suggest differences in efficiency which were related to the EU membership (i.e. commercial bank sin EU countries note higher cost efficiency than in non-EU countries). Degl'Innocenti et al. (2017) have examined the efficiencies of banking sectors of 9 new EU members in CEE countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Romania) using a window-based weight assurance region (WAR) approach over the period 2004–2015. Their results indicate a low level of efficiency over the entire period of analysis, especially for Eastern European and Balkan countries in comparison with the Central European countries. Gržeta (2020) has applied the BCC DEA input-oriented model with the VRS assumption for assessing the technical relative efficiency of 104 commercial banks from 11 Central and Eastern Europan countries in the period from 2006 to 2015. In his paper, funding, fixed assets, personnel expenses and expenses on value adjustments, and provisions have been selected as inputs, while loans, net provisions, and other earning assets as outputs. The average relative efficiencies for the entire observed data set of commercial banks is 0.8848, of which the relative efficiencies of small banks, on average, are 0.8542, while the relative efficiencies of medium-sized banks are 0.9039, and he concludes that middle-sized banks show higher relative efficiency than small banks. However, when viewed by country, he presents differences in efficiencies. Croatia is in the penultimate place, just ahead of Romania with an average relative efficiency of 0.8317 for all the active commercial banks. Kozak (2020) has applied the stochastic frontier approach (SFA) to investigate the profit efficiency scores of 108 banks operating in eleven CEE countries (among which he analysed 16 Croatian banks) in the period from 2005 to 2017. The results show that the Croatian banking sector has an average profit efficiency score of 83.8%. He has also found that efficiency scores dropped in the period of the financial crisis 2007-2009 and the crisis of public finance in the euro area 2012-2013. The latest cross-country study has been published by Cvetkoska, Fotova Čiković and Tasheva (2021). In their study, the authors measure the relative efficiency of commercial banks in three developing countries deriving from ex-Yugoslavia (Croatia, Serbia, and North Macedonia) in the period of five years (2015-2019). They have used interest and non-interest expenses as inputs, and interest and non-interest revenue as outputs. In their study, they implemented the output-oriented BCC model. Their findings show that 36.3% of Macedonian banks, 18.2% of Serbian banks, and 42.1% of Croatian banks are relative-efficient for the whole observed period, and most of the relative-efficient banks for the whole observed period are large banks. They also presume that Croatian banks have experienced positive implications of EU accession in July 2013, which is equivalent to the findings of Novak et al. (2020) and Davidović et al. (2019).

4. CONCLUSION

Banks are the most important financial institutions and intermediaries worldwide. Notwithstanding, banks' performance, profitability and efficiency notably contribute to the economic growth and stability of the whole financial system (Pavković et al., 2018). The efficient operating of banks is vital in any economy and especially vital in developing countries like Croatia. High capitalization and liquidity remain the basic characteristics of the banking system of the Republic of Croatia. However, a challenging period is ahead for the banking system in Croatia. The COVID-19 pandemic has caused unfavorable economic trends and a significant materialization of credit risk. Croatian banks are expected to experience losses due to lower revenues and impairment on financial assets that would significantly lower their profitability (Financial Stability, 2020). This is the reason why at this point the efficiency of banks is even more important.

Based on the extensive literature review, this article focuses both on DEA theory and empirical evidence with application in the evaluation of the banking sector's performance and efficiency in Croatia. Most of the studies were conducted for the time frame between 2002-2015, while there is a lack of research regarding the efficiency of the Croatian banking sector before the 2000s and after 2017. DEA methodology is an excellent non-parametric method that gives insights regarding banking efficiency and provides important information for the bank management, creditors, investors, regulatory bodies, academics, researchers and other stakeholders. There is a limited number of studies that analyse and measure the efficiency of Croatian banks and we hope that this article would impact a change in that statistics soon. The main goal of this article is to present the application of DEA in the Croatian banking sectors. The authors have analysed and presented a total of 8 articles. In this article, authors have included papers that can be accessed on Google Scholar, CROSBI (the Croatian scientific bibliography), and via personal contacts with researchers from Croatia. Furthermore, 12 cross-country studies were analysed and their findings were presented. In our reviewed literature, both CCR and BCC models have been used in the studies regarding the Croatian banking sector. Following is a summary of our findings: on average, foreign banks were most efficient and more efficient than domestic banks; new banks were averagely more efficient than old banks; large banks are the most profitable and most efficient banks' group using variable returns to scale (BCC model), while the medium-sized banks appear most efficient using constant returns to scale (CCR model); EU membership has brought vast advantages for Croatian banks in terms of efficiency; and finally, in terms of size, on average, the group of large banks has noted highest efficiency results, whereas the group of small banks the lowest efficiency results. The conclusion from this extensive literature review is that there is a gap in the literature regarding the comparison of the efficiencies of banking sectors in non-EU and EU countries, as well as a comparison of the banking sectors efficiencies in the Balkan countries and the region of South-Eastern Europe. Finally, this article should be considered as solid ground and a stepping stone for further literature reviews as well as empirical studies of the efficiency of the Croatian banking sector by implementing the leading non-parametric approach DEA.

LITERATURE:

1. Ahec Šonje, A., Deskar-Škrbić, M., Šonje, V. (2018). Efficiency of Public Expenditure on Education: Comparing Croatia with other NMS. U: Chova, G., Martinez, L. & Torres, C. (ur.) *INTED2018 Proceedings* doi:10.21125/inted.2018.0439
2. Anayiotos, G., Toroyan, H., Vamvakidis, A. (2010). The efficiency of emerging Europe's banking sector before and after the recent economic crisis. *Financial Theory and Practice* 34 (3) 247-267
3. Andries, A. M., Ursu, S. G. (2016). Financial crisis and bank efficiency: An empirical study of European banks. *Economic Research – Ekonomska istraživanja*, Vol. 29, No. 1, pp. 485-497
4. Andries, A.M., Cocris, V. (2010). A comparative analysis of the efficiency of Romanian banks. *Romanian Journal of Economic Forecasting* – 4/2010, pp. 54-75
5. Aristovnik, A., Obadić, A. (2012). Measuring the technical efficiency of secondary education in Slovenia and Croatia: a DEA approach. U: Galetić, L. & Šimurina, J. (ur.) *6th International Conference – An Enterprise Odyssey: Corporate governance and public policy – path to sustainable future*, CD-ROM Electronic Proceedings.
6. Bahovec, V., Neralić, L. (2001). Relative efficiency of agricultural production in county districts of Croatia. *Mathematical Communications, Supplement*, Vol. 1, No. 1, pp.111–119.

7. Banker, R.D., Charnes, A., Cooper, W.W. (1984). Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis. *Management Science*, 30(9), pp.1078-1092.
8. *Banks bulletin* (2019), No. 32, Year 19, Croatian National Bank. Retrieved from: https://www.hnb.hr/documents/20182/2868711/ebilten-o-bankama-32.pdf/3a0e4fc0e413-49da-2a9b-3c9fc0ff0b84
9. Barth, J., Lin, C., Ma, Y., Seade, J., Song, F.M., (2013). Do bank regulation, supervision and monitoring enhance or impede bank efficiency? *Journal of Banking & Finance*, 37, issue 8, p. 2879-2892
10. Bezić, H., Galović, T., Petar, M. (2013). Efficiency of the Pharmaceutical Industry of the Selected European Countries through Implementation of the DEA Analysis. U: Vrdoljak Raguž, Ivona, Roushdy, Mohamed, Salem, Abdel-Badeeh (ur.) *Proceedings of the 1st International Conference on Management, Marketing, Tourism, Retail, Finance and Computer Applications (MATREFC'13)*.
11. Charnes A, Cooper, W.W., Lewin, A.Y., Seiford, L.M. (1994). *Data Envelopment Analysis*. Boston: Kluwer
12. Charnes, A., Cooper, W., Rhodes, E. (1978). Measuring the Efficiency of Decision-Making Units. *European Journal of Operational Research*, 2(4), pp. 429-444. doi: https://dx.doi.org/10.1016/0377-2217(78)90138-8
13. Cvetkoska V, Fotova Čiković K, Tasheva M. (2021). Efficiency of Commercial Banking in Developing Countries. *Mathematics*. 9(14):1597. https://doi.org/10.3390/math9141597
14. Cvetkoska V., Fotova Čiković K. (2020). Assessing the relative efficiency of commercial banks in the Republic of North Macedonia: DEA window analysis. *Croatian Operational Research Review CRORR*, vol. 11, pp. 217-227.
15. Cvetkoska, V., Savić, G., (2017). Efficiency of bank branches: empirical evidence from a two-phase research approach. *Economic Research-Ekonomska Istraživanja*, 30:1, pp. 318-333, DOI: 10.1080/1331677X.2017.1305775
16. Cvetkoska, V., Barišić, P. (2017). The efficiency of the tourism industry in the Balkans. In *Proc. of the Faculty of Economics in East Sarajevo*, Vol. 14, pp.31-41. doi:10.7251/ZREFIS1714031C.
17. Cvetkoska, V., Fotova Čiković, K. (2021). Efficiency analysis of Macedonian and Croatian banking sectors with DEA. *Economy, Business and Development: An International Journal*. 2(2), 1-19, DOI:10.47063/ebd.00003
18. Davidovic, M., Uzelac, O., Zelenovic, V. (2019). Efficiency dynamics of the Croatian banking industry: DEA investigation. *Economic Research-Ekonomska Istraživanja*, 32:1, 33-49, DOI: 10.1080/1331677X.2018.1545596
19. Degl'Innocenti, M., Kourtzidis, S.A., Sevic, Z. Tzeremes, N.G. (2017). Investigating bank efficiency in transition economies: A window-based weight assurance region approach. *Economic Modelling*, Volume 67, Pages 23-33, ISSN 0264-9993, https://doi.org/10.1016/j.econmod.2016.08.015.
20. Efendić, V. (2017). Efficiency of Islamic and Conventional Banks: Empirical evidence from Bosnia and Herzegovina. *Journal of Islamic Economics, Banking and Finance*, Vol. 13, No. 4
21. Farrell, M. (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society*, Series A (General), 120(3), 253-290. https://doi.org/10.2307/2343100
22. *Financial Stability* (2020), No. 21, Year 20, Croatian National Bank. Retrieved from: https://www.hnb.hr/documents/20182/3393533/e-fs-21.pdf/de9948d6-6079-afa5-09f7-5d78fac3eebe
23. Fotova Čiković, K., Cvetkoska, V. (2017). Efficency of the Macedonian banking sector: a non-parametric approach. *CEA Journal Of Economics*. Vol 12, No 2, pp. 17-26

24. Galac, T., Kraft, E. (2001). What has been the impact of foreign banks in Croatia? *Croatian National Bank*, 1–20
25. Gardener, E., Molyneux, P., Nguyen-Linh, H. (2011). Determinants of efficiency in South East Asian banking. *The Service Industries Journal*, 31(16), 2693-2719.
26. Gardijan, M., Kojić, V. (2012). DEA-based investment strategy and its application in the Croatian stock market. *Croatian Operational Research Review (CRORR)*, Vol. 3, pp. 203-212
27. Gardijan, M., Škrinjarić, T. (2015). Equity portfolio optimization: A DEA based methodology applied to the Zagreb Stock Exchange. *Croatian Operational Research Review*, 6 (2), 405-417 doi:10.17535/crorr.2015.0031
28. Grigorian, D.A., Manole, V. (2002). Determinants of Commercial Bank Performance in Transition: An Application of Data Envelopment Analysis. *IMF Working Papers*. Volume 2002: Issue 146. Pp. 1-28. https://doi.org/10.5089/9781451856651.001
29. Grmanova, E., Ivanová, E. (2018). Efficiency of banks in Slovakia: Measuring by DEA models. *Journal of International Studies*, 11(1), 257-272. doi:10.14254/2071-8330.2018/11-1/20
30. Gržeta, I. (2020) Usporedba efikasnosti banaka Republike Hrvatske s odabranim zemljama Srednje i Istočne Europe (SIE) - DEA pristup. U: Tomljanović, M. (ur.) *Suvremeni izazovi EU, Republike Hrvatske i zemalja Zapadnoga Balkana*. Rijeka, Sveučilište u Rijeci, Ekonomski fakultet Rijeka, str. 181-193.
31. Huljak, I. (2015). Cost efficiency of banks in Croatia. *Croatian Review of Economic, Business and Social Statistics (CREBSS)*. Vol. 1, No. 1-2, 2015, pp. 12-26
32. Hunjak, T., Jakovčević, D. (2001). AHP Based Model for Bank Perfomance Evaluation and Rating. U: *Sixth International Symposium on the Analytic Hierarchy process*, ISAHP 2001.
33. Jemrić, I., Vujčić, B. (2002). Efficiency of Banks in Croatia: A DEA Approach, *Comparative Economic Studies*, Vol. 44, No. 2-3, pp. 169-193, 10.1057/ces.2002.13.
34. Jovancevic, R. (1999). Macroeconomic Environment and the Banking System of Croatia, in: Ž. Šević, ed., *Banking Reform in South East European Transitional Economies*, University of Greenwich Business School, Balkan Centre for Public Policy and Related Studies, and Humanities Research Centre, Sofia-London, pp. 239–260.
35. Jurčević, B., Mihelja Žaja, M. (2013). Banks and insurance companies efficiency indicators in the period of financial crisis: the case of the Republic of Croatia. *Ekonomska istraživanja-Economic research*, vol. 26 (1), pp. 203-224
36. Khaksar, M., Malakoutian, M.M.A. (2020). Productivity Evaluation for Banking System in Developing Countries: DEA Malmquist Productivity Index Based on CCR, BCC, CCR-BCC (A Case Study). *ENG Transactions*, vol. 1, pp. 1–15, 2020.
37. Kordić, L., Višković, J. (2018). Investigating efficiency of Croatian banking sector - further steps towards more efficient banks. In *Proc. 7 th International Scientific Symposium Gospodarstvo istočne Hrvatske – vizija i razvoj - Economy of eastern Croatia - vision and growth*, pp. 1023-1031
38. Kozak, S. (2020). Are Larger Banks More Efficient in the Central Eastern European Countries?. *Annales Universitatis Mariae Curie-Skłodowska, sectio H – Oeconomia*, Vol. 54, No. 2
39. Kraft, E., Galac, T. (2007). Deposit interest rates, asset risk and bank failure in Croatia, Journal of Financial Stability. Volume 2, Issue 4, pp. 312-336, https://doi.org/10.1016/j.jfs.2006.08.001.
40. Kraft, E., Hofler, R., Payne, J. (2002). Privatization, foreign bank entry and bank efficiency in Croatia: a fourier-flexible function stochastic cost frontier analysis. *Working Papers W-9* Croatian National Bank.

41. Kraft, E., Huljak, I. (2018). How Competitive is Croatia's Banking System? A Tale of Two Credit Booms and Two Crises. *Working papers w-54*, Croatian National Bank.
42. Kraft, E., Tırtıroglu, D. (1998). Bank Efficiency in Croatia: A Stochastic-Frontier Analysis. *Journal of comparative economics* 26, 282–300, Article no. Je981517
43. Kraft, E., Tırtıroğlu, D. (1998). Bank efficiency in Croatia: A stochastic-frontier analysis - *Journal of comparative economics*. Vol. 26 (2)
44. Kropivšek, J., Jošt, M., Grošelj, P., Motik, D., Pirc Barčić, A., Perić, I. (2019). A Comparative Evaluation of Operational Efficiency of Wood Industry Using Data Envelopment Analysis and Malmquist Productivity Index: the Cases of Slovenia and Croatia. *Drvna industrija*, 70 (3), 287-298 doi:10.5552/drvind.2019.1937.
45. Lukić, R. Hadrović Zekić, B. (2019). Evaluation of Efficiency of Trade Companies in Serbia Using The DEA Approach. U: Dujak, D. (ur.) *Business Logistics in Modern Management - Proceedings of the 19th International Conference*.
46. Maletić, R., Kreća, M., Maletić, P. (2013). Application of Dea methodology in measuring efficiency in the banking sector. *Economics of Agriculture*. 60 (4), pp.843-855
47. Maradin, D., Olgić Draženović, B., Benković, S. (2018). Performance evaluation of banking sector by using DEA method. U: Ribeiro, Humberto, Naletina, Dora, da Silva, Ana Lorga (ur.) *Economic and Social Development (Book of Proceedings)* 35th International Scientific Conference on Economic and Social Development – "Sustainability from an Economic and Social Perspective".
48. Micajkova, V., Poposka, K., (2013). Efficiency of Macedonian Banks: A DEA Approach. *Research Journal of Finance and Accounting*, Vol. 4, No. 12: 141-149.
49. Naumovska, E., Cvetkoska, V. (2014). Measuring the Efficiency of the Banking Sector in the Republic of Macedonia. Annual of the Faculty of Economics – Skopje, Vol. 49, 221-238.
50. Naumovska, E., Cvetkoska, V. (2016). Efficiency of the Macedonian banking sector. *Yugoslav Journal of Operations Research*, [S.l.], v. 26, n. 3
51. Neralić, L., Gardijan Kedžo, M. (2019). A Survey and Analysis of Scholarly Literature in DEA Published by Croatian Researchers: 1978 – 2018. *Zagreb International Review of Economics & Business*, 22(1), str. 93-106. https://doi.org/10.2478/zireb-2019-0014
52. Novak, M., Hsu, S.Y. (2020). Efficiency of Banks in Croatia. *Economic Insights – Trends and Challenges*. Vol.IX(LXXII) No. 4/2020, pp. 25-33
53. Novickytė, L., Droždz, J. (2018). Measuring the Efficiency in the Lithuanian Banking Sector: The DEA Application. *International Journal of Financial Studies*. 6(2):37. https://doi.org/10.3390/ijfs6020037
54. Nurboja, B., Košak, M. (2017). Banking efficiency in South East Europe: Evidence for financial crises and the gap between new EU members and candidate countries. *Economic Systems* 41: 122–38. doi:10.1016/j.ecosys.2016.05.006
55. Paço, C.L., Pérez, J.M.C., (2013). The use of DEA (Data Envelopment Analysis) methodology to evaluate the impact of ICT on productivity in the hotel sector. *En ligne*, 3, DOI: https://doi.org/10.4000/viatourism.1005
56. Pancurova, D., Lyocsa, S. (2013). Determinants of Commercial Banks' Efficiency: Evidence from 11 CEE Countries. *Finance a Uver—Czech Journal of Economics and Finance* 63: 152–79.
57. Pavković, A., Cesarec, A., Stojanović, A. (2018). Profitability and efficiency of the Croatian banking sector: impact of bank size. *Int. J. Trade and Global Markets*, Vol. 11, No. 4, pp.243–258.
58. Pervan, M., Pelivan, I., Arnerić, J. (2015). Profit persistence and determinants of bank profitability in Croatia. *Economic research - Ekonomska istraživanja*, 28(1), pp. 284-298. https://doi.org/10.1080/1331677X.2015.1041778

59. Peša, A., Maté, M., Prvonožec, S. (2021). Measuring bank efficiency: Croatian banking sector research. U: Leko Šimić, M. & Crnković, B. (ur.) *Proceedings of 10th International Scientific Symposium Region, Entrepreneurship, Development – RED*.
60. Primorac, M., Troskot, Z. (2005). Measuring the efficiency and productivity of the Croatian banks with Malmquist's index of change of total factor productivity. *Financial Theory and Practice*, 29 (4), pp. 309-325
61. Rabar, D. (2010). Ocjenjivanje efikasnosti poslovanja hrvatskih bolnica metodom analize omeđivanja podataka. *Ekonomski pregled*, 61 (9-10), 511-533.
62. Rakocevic, S., Dragasevic, Z. (2009). Analysis of the Efficiency of Banks in Montenegro Using the AHP. *Proceedings of Tenth International Symposium on Analytic Hierarchy Process (ISAHP 2009)*, University of Pittsburgh, USA.
63. Repkova, I. (2014). Efficiency of the Czech Banking Sector Employingthe DEA Window Analysis Approach. *Procedia Economics and Finance*, Vol. 12, pp. 587-596
64. Sari, U.T . (2019). Do ownership, method and type really matter? A literature survey on comparative bank performance and efficiency. *Süleyman Demirel Üniversitesi Vizyoner Dergisi* , 10 (25) , 631-649 . DOI: 10.21076/vizyoner.594364
65. Savić, G., Radosavljević, M., Ilievski, D. (2012). DEA window analysis approach for measuring the efficiency of Serbian banks based on panel data. *Journal for Theory and Practice Management*, 65, 5–14
66. Škuflić, L., Rabar, D., Škrinjarić, B. (2013). Assessment of the efficiency of Croatia compared to other European countries using data envelopment analysis with application of window analysis. *International journal of sustainable economy*, 5 (1), 104-123 doi:10.1504/IJSE.2013.050601.
67. Staub, R. B., Souza, G. S., Tabak, B. M. (2010). Evolution of bank efficiency in Brazil: A DEA approach, *European Journal of Operational Research*, Vol. 202, No. 1, pp. 204-213
68. Stojčić, N. (2012). Two Decades of Croatian Transition: A Retrospective Analysis. *SEE Journal*. DOI: 10.2478/v10033-012-0015-5
69. Sufian, F., Kamarudin, F. (2016). Determinants of efficiency in the Malaysian banking sector: Does bank origins matter? *Intellectual Economics*, 10(1), 38-54.
70. Thanassoulis, E. (2001). *Introduction to the Theory and Application of Data Envelopment Analysis. A Foundation Text with Integrated Software*. Springer.
71. Tipurić, D., Kolaković, M., Dumičić, K. (2002). Istraživanje promjena u koncentraciji Hrvatske bankarske industrije 1993.-2000. *Ekonomski pregled*, 53 (5-6) pp. 470-494
72. Titko, J., Stankevičienė, J., Lāce, N. (2014). Measuring bank efficiency: DEA application. *Technological and Economic Development of Economy*, 20(4), 739-757.
73. Toçi, V. (2009). Efficiency of Banks in South-East Europe: with Special Reference to Kosovo. *CBK Working paper*, No. 4.
74. Tomičić, I., Čorić, A., Klačmer Čalopa, M. (2012). Croatian Banking Sector Research: Relationship between Ownership Structure, Concentration, Owners' Type and Bank Performance. *JIOS*, vol. 36, no. 2
75. Tomova M., (2005). *X-efficiency of European Banking - Inequality and Convergence*. Free University of Brussels.
76. Tsaples, G., Papathanasiou, J. (2020). Multi-level DEA for the construction of multi-dimensional indices. *MethodsX*, 7, 101169. https://doi.org/10.1016/j.mex.2020.101169
77. Tuškan, B., Stojanović, A. (2016). Measurement of cost efficiency in the European banking industry. *Croatian Operational Research Review*, 7 (1), 47-66. https://doi.org/10.17535/crorr.2016.0004
78. Vitezić, N., Šegota, A., Setnikar Cankar, S. (2016). Measuring the efficiency of public health services by DEA. *International Public Administration Review*, 14 (4), 27-48 doi:10.17573/ipar.2016.4.02.

79. Yang, Z. (2009). Bank Branch Operating Efficiency: A DEA Approach. *Proceedings of the International MultiConference of Engineers and Computer Scientists.* Vol II IMECS 2009, March 18 - 20, 2009, Hong Kong

INFLUENCE OF POPULATION GROWTH TO SUSTAINABLE DEVELOPMENT

Sabina Cumazade
Azerbaijan Tourism and Management University
Koroglu Rahimov str. 822/23, Baku, Azerbaijan
Sebine.Yusifova52@gmail.com

ABSTRACT

One of the important problems faced by the economic policy of the country in modern times is to ensure the sustainability of economic growth. Because economic growth provides the increase in national wealth in the country and the improvement of the living standards of the population. Economic growth leads to higher incomes, which leads to higher consumption, while higher consumption leads to higher living standards. There are many benefits to pursuing an effective population policy. The most important of these is to ensure the welfare of the population and sustainable development. By creating an effective population policy, it is possible to offer alternative solutions to possible problems and to transfer to future generations a livable world, and to transfer its natural and cultural heritage from the past to the future. The aim of social policy is to achieve regulation and alignment of interests related to sustainable and balanced development of society, social security and social solidarity. It can be interpreted in a broader context, noting that social policy permeates almost all spheres of life. All human activities and goals are for providing the needs of individuals, the development of social welfare. Thus, the purpose of social activities is to serve members of society. The political choice of society and the governmental forces play a key role in the implementation of model. The ideological and political structure has a significant influence on decision making in this direction. Sufficient funds, systematic and consistent action, strong political will, and a permanent understanding between the state and society make it available to development of the social field and the successful results of the reforms that will provide this. Investigation about the population that can participate as both producers and consumers in terms of ensuring long-term economic stability and determining the impact of demographic processes on socio-economic development is crucial in establishing effective population policies and social development policies. In this article, using the 1990-2019 data for Azerbaijan, the relationship between GDP and population was investigated using alternative econometric methods, the causality test, the VAR test.

Keywords: *demographic processes, economic growth, social development*

1. INTRODUCTION

Nowadays the study of the relationship between the economic development and population growth of countries plays an important role in the formation of development strategies. According to the Brutland Commission, sustainable development means development that does not compromise the ability of the current generation to meet its own needs and interfere with the responsibilities of the next generation. The article will focus on the economic factors of sustainable economic growth. In this sense, sustainable development is development that ensures a reduction in national wealth per capita by replacing or transforming productive, human, social and natural capital, which are sources of wealth [9]. Economic development is broader than economic growth. At the same time, the main condition for achieving economic development in the country is to ensure sustainable economic growth. Any rate of economic growth can not ensure long-term economic development. For this, it is necessary to achieve dynamically balanced rates of economic growth.

That is, stable rates of economic growth should ensure the equality of aggregate demand with aggregate supply, that is, macroeconomic equilibrium, which dynamically changes from time to time. In such a situation, one of the important questions is the choice between consumption and saving. The level of current consumption in a country determines the standard of living of the population[7]. However, while increasing savings reduces current consumption, it creates conditions for investment to increase national wealth. From this point of view, the choice between the standard of living of the current generation and the standard of living of the next generation depends on how much of the income is spent on final consumption expenditures and how much on national savings. Investment through national savings leads to an increase in the country's production capacity and, as a result, economic growth. Each state is more or less socially responsible to its citizens. At the same time, the state has certain social qualities and characteristics. The modern development model of market economy realizes necessity of management of social processes consciously, purposefully and in accordance with national interests and implemention of this on the basis of the most modern and civilized social technologies. Social policy is one of the important components of the activity of a modern state as a mechanism that directly indicates the processes of development of society. Consequently, social policy is closely related to the level and type of development of society. I.A. Grigoriev tried to take a more comprehensive approach to social policy. According to him, social policy is aimed at harmonizing the interests of different social groups and socio-territorial communities in the areas of production, distribution and consumption of the state or society, as well as ensuring consistency between the interests of these groups and the long-term goals of society. Today, both the historical period in which we live and our past history have a definite impact on the course of solving the social problems of our republic. Since we were part of the former USSR for many years, we have inherited the tradition according to which the state is responsible for solving the main problems associated with the activities of citizens. However, in addition to this, the choice of a social policy model also depends on the forces in power. That is, the political choice of society and the forces that govern it plays a key role in the application of a particular model. The ideological and political structure has a significant impact on decision-making in this direction. This position is based on the availability of sufficient funds, systematic and consistent action, strong political will and strong understanding between the state and society. Otherwise, it would be impossible to talk about the development of the social sphere and the successful results of the reforms that will ensure it. In addition to the above issues, in my opinion, one of the most important aspects is the place and position of a person in the applied model of social policy. Thus, the level of social development achieved by society today indicates the need to approach a person as an individual, and not consider him as one of the factors of production. Some researchers consider this to be one of the main drawbacks of social policy models and even point out that this is a feature of the Scandinavian model [1]. Thus, when forming a model of social policy, a person should be considered as a labor force, a consumer and a social being, that is, a person should be at the center of social development both as an employee and as a social being and each model of social policy should be based on the priorities of the development of the individual and society as a whole against the background of the highest goals of this development. When measuring the level of development in the world, it is important to take into account economic and educational data, as well as data on education and health. An educated and healthy society is essential for the development and effective use of human capital. However, the effective use of available capital depends on a person's satisfaction with financial capabilities and social relations. Human capital cannot be equated with education and health only. In addition, factors such as dynamic populations and brain drain are among the factors influencing the accumulation of human capital [5].

2. POPULATION AND SOCIAL POLICY

There are many benefits to pursuing effective population policies. The most important of them is to ensure the well-being and sustainable development of the population with a peaceful life, where the owner has the resources to use them effectively. In addition, it is necessary to propose effective solutions to potential problems and develop effective population policies to pass on a livable world to future generations and pass on its natural and cultural heritage from the past to the future [10]. The goal of social policy is to achieve regulation and harmonization of interests, social protection and social solidarity in the direction of sustainable and balanced development of society [12]. At the same time, I.A. Grigoriev considers the provision of these interests as the activity of both the state and society (public institutions). Within the framework of this approach, the author tried to interpret social policy in a broader context, noting that it affects almost all spheres of society. It follows from this that all human activity and goals are aimed at meeting the needs of individuals, the development of social life, that is, the goal of society is to serve the members of society. There were no serious studies of human capital in the 18th and 19th centuries, but at the end of the 20th century it was subjected to numerous economic studies, and its relationship with economic development in various dimensions was analyzed in different countries [5]. With its economic growth in recent years and a large proportion of the world's population (19.24%), China is a noticeable country. China's gap between economic growth and population are projected to continue. Changes in the structure of the Chinese population, which is about 1/6 of the world's population, naturally affect the world. Potential social, cultural and economic events in this country will cause the changes all over the world. From 1949 to 1969, the population increased by 265 million, which led to a tightening of demographic policy. For this reason, the One Child Policy conference was held in the 1970s to prevent rapid population growth. In addition to educating the public about birth control, contraceptive factories were set up and these products were delivered free of charge to the public. The restricted demographic policy, known in China as the “one child policy,” is not the same in the sense that each parent has only one child, as is well known in society. In China, demographic policies differ by region, health status, minorities, urban and rural. In other words, China's demographic policy was more flexible with regard to ethnic minorities and rural populations. If the first children of the villagers were girls or disabled, they were allowed to the second child. In short, in the coming decades the universal two-child policy will help to address the challenge of population ageing, reduce the sex ratio at birth, remove the more oppressive elements of the one-child policy, contribute to economic growth, and allow the overwhelming majority of couples to have the number of children they want [3]. One of the most important issues associated with China's strict population policy is the growth of the elderly population and the unpaid costs of the social security system. There are 131.6 million people over 65 in China. The population over 60 is estimated to increase to 202 million and surpass 300 million by 2025 [13]. Life expectancy in China increased from 44.5 years from 1950 to 1955 to 74.4 years from 2005 to 2010. The increase in life expectancy is an important factor in the increase in the proportion of older people [11]. On the other hand, an imbalance between male and female populations is a negative result of anti-natalist policies. In China, where male children are more in demand due to their cultural structure, the need to have an only child has led to the development of a number of methods. First, it is revealed that the sex of the child is a girl in early pregnancy, and then an abortion is performed in order to realize the child's right to a boy. In addition to 10 million small pill sales a year, the number of legal abortions is reported to be 13 million a year. However, the number of informal abortions is unknown. In some parts of China, there are 140 men for every 100 women and 120 men for every 100 women. The one-child policy, introduced after the 1970s, led to a slowdown in economic growth and an increase in average age. For this reason, it was decided to abolish the anti-natalist policy by a decree adopted in 2013.

According to this regulation, one of the parents is the only child in the family and has the right to have two children. In 2015, only children restricted practices were completely canceled [8]. China's restricted demographic policies since the 1970s have stymied 400 million population growth, according to Chinese officials. In China, where 30% of the population is over 50, this practice is expected and mandatory. However, in China, where the one-child family phenomenon has become a social model, this practice is not believed to solve the problem such as the elderly population, inequality between women and men, and a shrinking workforce. Zhang Weiqing, chairman of the China Population and Family Planning Commission, said that by the middle of the 21st century, China's elderly population will account for a quarter of the world's population, posing a serious threat to the economy and social structure, resources and the environment [4]. According to research,the importance of raising the retirement age and the inclusion of older people in working life is emphasized, since the number of older people has increased both due to an increase in life expectancy and due to a slowdown in population growth. France was one of the first countries to pursue pro-natalist policies due to an aging population and slower economic growth, and one of the most comprehensive pro-natalist policies [2]. In other words, France has a long history of pro-natalist politics and is one of the countries offering both comprehensive and high financial incentives. In particular, the combined application of children and working life is shown as an example. France has two years of paid leave, as well as a guarantee to return to work after maternity leave. For working women, a day school system was introduced to achieve a balance between family and work. The decline in the country's population, established in 1896, occurred between the creation of the Center for Cooperation and public policy in which population policy was strictly pursued. Immigration from Italy and Poland was encouraged in the 1920s, but advertising for abortion and contraceptives was banned. Post-natal monetary and tax breaks were introduced after World War II. In the 1970s, pro-natalist policies were aimed at achieving a balance between family life and work. France, based in developed countries, can receive subsidies from a dependent population, which has grown to significant proportions due to its current economic strength. However, the continuation of the young and dynamic generation must be ensured by reducing the number of dependent population in terms of the sustainability of the existing economic power. The need for pro-natalist politics was felt in the last quarter of the 20th century, when the population of France increased significantly into the 21st century. Within the framework of the pronatalist policy, special attention was paid to advertising and protection of interests. Incentives have been developed for flexibility in working life and the desire of families to have children in order to keep children out of families. Women with children are entitled to 4 months of paid leave. Benefits are provided to families with children in the field of transport, housing and education. Calls for the state are made with slogans like if you have three children and your car is free.This campaign is said to provide enough support for those with three children to buy a car. In addition to long-term family-centered public policies, France supports practices such as ensuring a balance between family and work, increasing childcare benefits and family benefits in order to increase the number of fetuses [2]. In France, families receive assistance in many areas, from child support to education and housing. Regardless of the difference between rich and poor, each family receives 320 euros for one child, 430 euros for two children and 540 euros for three children. These child benefits continue until graduation from university education. In addition, mothers are given money for up to 16 weeks [6]. France has adopted methods that combine family life and work and policies that encourage women to adapt to social life and to work outside the home. Thus, the participation of women in the labor force didn’t interfere with family life and women in the labor force decided to have children [12].

3. EMPRIC ASSESSMENT OF RELATIONSHIP OF SOCIO-ECONOMIC DEVELOPMENT AND DEMOGRAPHIC PROCESSES

This article aims to test the relationship between GDP and population using alternative econometric methods using annual data for 1990-2019 for Azerbaijan. For this, the characteristics of the series and the relationship between the variables were investigated using time series methods.

3.1. Data set used

The variables used in this study were (GDP) = real gross domestic product and (NUF) = population, and the study covers the years 1990-2019. Nominal GDP became real with the GDP deflator (1990 = 100). The variables were analyzed after obtaining the logarithms. (LUDM) =(LGSMH) logarithm represents real GDP, (LNUF) = logarithm represents the resulting population variable. The econometric analysis used the Rats and Eviews software packages.

Empirical Results: Stability analysis results - Dickey-Fuller unit root tests were used to test the stability of the series. The results related to the stability properties of the ranges within the DF test are shown in Table 1.

Variables	Without trend	P	With trend	P
LÜDM	0.1903(-2.9092)	0	-1.5494(-3.4836)	0
LNUF	-1.4112(-2.9109)	2	0.8715(-3.4862)	2
DeltaLÜDM	-7.9745(-2.9101)	0	-7.7172(-3.4849)	0
Delta NUF	-2.3556(-2.9109)	1	-3.0399(-3.4862)	l
Delta^2 LNUF	-5.1810(-2.9109)	0	-5.3475(-3.4862)	0

Table 1: Result of Unit root test
(Source: calculated by author in Eviews programs)

The values at the nodes represent the critical values of the ADF-t statistic in the table at the 5% significance level. "P" is the optimal delay length determined according to the optimal AIC. After the optimal delay length, which will not lead to autocorrelation due to erroneous conditions, will be determined by the AIC criterion, both by the trend and the trend equation l lag of the LUDM sequence. It was found that the LNUF sequence is constant at the 2nd difference, and the necessary precondition for investigating the cointegration relationship between the two sequences could not be met (LUDM-I (1), LNUF-1 (2,)). This indicates a lack of long-term relationship between the two variables.

3.2. Results of a standard Granger causality analysis

The optimal lag length of the variables for the Granger causality test was determined using the AIC, and causation equations were obtained.

$$\Delta LGSMH_t = \alpha_0 + \sum_{i=1}^{2} \alpha_i \Delta LGSMH_{t-i} + \sum_{i=1}^{2} \beta_i \Delta^2 LNUF_{t-i} + u_t \qquad 3.1$$

$$\Delta^2 LNUF_t = \lambda_0 + \lambda_1 \Delta^2 LNUF_{t-1} + \delta_1 \Delta LGSMH_{t-1} + v_t \qquad 3.2$$

According to the AIC criterion, the optimal delay length of the equations was determined as 2 for the equation(3.1) and 1 for the equation(3.2). The results of the F-test applied to the resulting causal equations are shown in Table 2.

Equations	F Statistics	Direction of causality	
DeltaLÜDM=DeltaLÜDM(2) DeltaLGSMH=DeltaLÜDM (2)+Delta^{2}LNUF(2)	F(2,53) 1.0568(0.3548)	NUF—+ÜDM	no
Delta^{2}LNUF=A^{2}LNUF(I) Delta ^{2}LNUF=Delta'LNUF(I)+ALÜDM(1)	(i. 56)=3.2203(0.0781)	ÜDM—+NUF	yes

Table 2: Granger Causality Test Results
(Source: calculated by author in Eviews programs)

According to the results of Granger's causal analysis, in the model in which DeltaLÜDM participated as the dependent variable, the Delta ^{2}LNUF coefficients did not differ from zero in the group at the 10% significance level. According to this result, there is no causal relationship from population to economic development. In the model in which Delta ^{2}LNUF is the dependent variable, the DeltaLÜDM coefficient was found to be nonzero at the 10% significance level. Accordingly, there is a causal link from socio-economic development to population. According to the predicted model, the coefficient DeltaLÜDM t is negative (-0.0049). This means that GDP growth will lead to population decline.

3.3. Hsiao Causality Analysis Results

$$\Delta^2 LNUF = 0.0003 + 0.5274\Delta^2 LNUF_{t-1} - 0.0049\Delta LGSMH_{t-1} + u_t \quad 3.3$$

In Hsiao approach, the optimal lag length of the equations was determined by the FPE criterion, and the causal relationship between GDP and NUF was analyzed using the following equations.

$$\Delta LGSMH_t = \alpha_0 + \sum_{j=1}^{5} a_j \Delta LGSMH_{t-j} + \sum_{j=1}^{6} b_j \Delta^2 LNUF_{t-j} + u_t \quad 3.4$$

$$\Delta^2 LNUF_t = \alpha_0 + \sum_{j=1}^{2} c_j \Delta^2 LNUF_{t-j} + \sum_{j=1}^{2} d_j \Delta LGSMH_{t-j} + v_t \quad 3.5$$

The results of a causality analysis based on Hsiao's method are summarized in Table 3.

Equations	FPEp,,	Causality relationship	
ALÜDM=ALÜDM (5) AÜDM=ALÜDM(5)+A'LNUF(6)	FPEq=0.00698 FPEp 0.00720	NUF—rÜDM	No
A°LNUF=A^{2}LNUF(2) A2LNUF=A^{2}LNUF(2)+ ALÜDM(2)	FPEq=2.68 FPE =2.58	ÜDM—rNUF	Yes

Table 3: FPE Test Results
(Source: calculated by author in Eviews programs)

The values in parentheses represent the optimal delay length as determined by the FPE criterion. According to the FPE criterion, in a model in which DeltaLÜDM is defined as an internal variable, the optimal latency values are 5 for a limited model and 6 for an infinite model. The calculated FPEs for the same model were set at 0.00698 for the constrained model and 0.00720 for the infinite model. The FPE values calculated in the model, in which Delta2 LNUF is defined as an internal variable, were set to 2.68 and 2.58, respectively, for the limited and unrestricted model. In a model in which the search is directed from population to economic development, the FPE value that gives the optimal delay length of the dependent variable, the

optimal delay length of the independent variables (FPEm <FPEn) - this means that there is no causal relationship from population to economic development. In a model where the direction of impact is from economic development to population, the FPE value, which gives the optimal lag length of the dependent variable, is greater than the FPE value, which gives the optimal lag length of the independent variable (FPEm> FPEn). In this case, he concludes that there is a one-way causal relationship between economic development and population.

3.4. VAR analysis results

The optimal lag length of the equations for the VAR analysis was determined to be 2 according to the AIC. Therefore, the equations in the VAR system are formed as follows:

$$\Delta LGSMH_t = \alpha_0 + \sum_{i=1}^{2} \alpha_i \Delta LGSMH_{t-i} + \sum_{i=1}^{2} \beta_i \Delta^2 LNUF_{t-i} + u_t \quad 3.6$$

$$\Delta^2 LNUF_t = \lambda_0 + \sum_{i=1}^{2} \lambda_i \Delta^2 LNUF_{t-i} + \sum_{i=1}^{2} \delta_i \Delta LGSMH_{t-i} + v_t \quad 3.7$$

The F-statistic, calculated as a result of solving the VAR system, is shown in Table 4:

Depending on the variable	F statistics	Direction of connection	
DeltaLÜDM(2,2)	F(t „ =1.0568[0.3548]	NUF—+ÜDM	Yoxdur
Delta ^{2}LNUF(2,2)	$F_t t_3$ j=3.0075[0.0579]	ÜDM—+NUF	Var

Table 4: Results of VAR Analysis
(Source: calculated by author in Eviews programs)

The values in the nodes indicate the optimal voltage length defined for the VAR system, and the values in square brackets represent the critical values in the table with a 10% F statistic. Based on the results of the VAR analysis, the inconsistency of the hypothesis H0 was determined, which assumes that the coefficients of the variable DeltaLNUF are statistically equal to zero in equation (3.6). In contrast, the DeltaLÜDM coefficients in equation (3.7) are statistically nonzero. According to this result, there can be no one-way causal relationship between population and GDP, and it is assumed that there is a one-way causal relationship between population and economic development. As part of the VAR analysis, dynamic interactions between variables were analyzed using the separation method. Differences in distribution of population and economic development are shown in Table 5.

Years	**Delta LÜDM**		**Delta^{2}LNUF**	
	Delta LÜDM	**Delta^{2}LNUF**	**Delta LÜDM**	**Delta^{2}LNUF**
1	100.00	0.0000	9.1 155	90.8845
2	99.6465	0.3535	9.2379	90.7621
3	97.9730	2.0270	13.7978	86.2022
4	97.7688	2.2312	14.8434	85.1566
5	97.7058	2.2942	I 5.1051	84.8949
6	97.7071	2.2929	15.0931	84.9069
7	97.7052	2.2948	15.0918	84.9082
8	97.7027	2.2973	15.0989	84.9012
9	97.7020	2.2980	15.1017	84.8983
10	97.7019	2.2981	15.1022	84.8978

Table 5: Separation of variables
(Source: calculated by author in Eviews programs)

The table above shows the differences in the distribution of population and GDP. According to the table, the influence of the population on the variance of GDP begins in the third year, but the scale of this influence is not very significant. The coefficient of interpretation of the dispersion of the population's GDP over a ten-year period is about 2-3%.

4. CONCLUSION

The concept of social policy is also a concept adopted in the context of relations between society and the state, and should be formed and implemented taking into account the specific historical conditions of the country, national characteristics. Social policy is, on the one hand, a concept related to state administration, state building, and, on the other hand, has a scientific content. Therefore, analysizing each country's condition for different time period is crucial. For different countries in various time period different results were taken. As a result of research, there is no causal relationship from population to economic development. However, there is a causal link from socio-economic development to population. An educated and healthy society is essential for the development and effective use of human capital. When measuring the level of development in the world, it is important to take into account economic and educational data, as well as data on education and health. Among the selection factors, the level of development of the middle class in the country plays an important role. Because the formation of a large middle class, sharing such values as stability and solidarity, has a significant impact on the achievement of social policy goals. The middle class can take an active part in the implementation of the optimal political course within the limits of its potential. The level of development of small and medium-sized businesses should create conditions for their formation as one of the main subjects of social development of society.

LITERATURE:

1. Bent Greve, (2007). *What Characterise the Nordic Welfare State Model (Research report no. XX)*. Department of Society and Globalisation, Roskilde University, Denmark: Science Publications.Retrieved07.05.2021fromhttps://www.researchgate.net/publication/26618949_What_Characterise_the_Nordic_Welfare_State_Model
2. Girard A. *Pronatalist policies in Eastern Europe and France.* (1983).Draper Fund Rep. Aug;(12):6-7. PMID: 12338982.
3. Jinghan Zeng (2019): *Chinese views of global economic governance*, Third World Quarterly Lanchaster University Publisher:Global South https://www.researchgate.net/publication/331131024_Chinese_views_of_global_economic_governance/link/5c66bb3d92851c48a9d67166/download
4. Kalache, A., Barreto, S. M., Keller, I. (2005). Global ageing: The demographic revolution in all cultures and societies. In: Johnson, M. L., Bengtson, V. L., Coleman, P. G., Kirwood, T. B. L. (eds) *The Cambridge handbook of age and ageing*, New York, NY: Cambridge University Press, pp. 30–46.
5. Karagul, M., (2003). *Beseri sermayenin ekonomik buyumeyle iliskisi ve etkin kullanimi [Effective use of human capital and its impact on economic growth]*. Akdeniz I.I.B.F. Dergisi,5,pp.79-90.
6. Magali Mazuy, Magali Barbieri, Translated by Catriona Dutreuilh.(2013). Population Volume 68, *Recent Demographic Trends in France: Fertility Remains Stable* Issue3
7. Мэнкью Н.Г. Макроэкономика. (1994). Пер. с англ. - М.: Изд-во МГУ, с. 158-159.
8. People's Daily. [accessed Aug 28, 2016];*400 million births prevented by one-child policy.* 2011 http://en.people.cn/90882/7629166.html.

9. United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, World Bank (2003): *Integrated environmental and economic accounting 2003*, Studies in Methods, Handbook on National Accounting, Series F, No. 61, Rev. 1, p.4.
10. World Population Policies 2009 , United Nations, Department of Economic and Social Affairs, Population division, New York 2010 https://www.un.org/en/development/desa/population/publications/pdf/policy/wpp.pdf
11. Yi Zeng and Therese Hesketh, *The effects of China's universal two-child policy* (2016)
12. Yilmaz Toktas, Ali Altiner.(2017).*Relationship between Human capital and economic growth an application to developing countries*, Eurosian Journal of Economics and Finance www.researchgate.net/publication/320058682

ANALYSIS OF THE COMPLIANCE OF THE REGULATORY FRAMEWORK OF TRANSFER PRICING IN THE COUNTRIES OF THE EUROPEAN UNION

Martina Sopta
Ekonomski fakultet u Zagrebu, Croatia

Vlatka Bilas
Ekonomski fakultet u Zagrebu, Croatia

Sanja Jakupovic
Ekonomski fakultet u Zagrebu, Croatia

ABSTRACT

The goal of this paper is to determine the level of harmonization of the transfer pricing regulation in European Union, by analyzing the regulation framework of transfer pricing in individual EU member states for the purpose of more efficient business operations. The managerial aspect of transfer pricing gives us an insight into the complexity of the observed matter that adjusts the costs within the corporation. In addition to the above, the aim is to answer the question of how necessary this harmonization is and what are the best ways to solve the problem of tax evasion on the one hand and double taxation on the other. As there is a danger that multinational companies use transfer pricing for the purpose of reducing profits, transfer pricing is under the special supervision of the tax authorities. The purpose of transfer pricing regulations is to ensure that companies accurately report the revenue attributable to transactions with related companies as they would in transactions with unrelated third parties.
Keywords: *transfer pricing, arm's length principal, cost management*

1. TRANSFER PRICING ACCORDING TO OECD

According to the OECD, the definition of transfer pricing in the context of multinational companies implies the prices at which a company transfers physical goods and intangible assets or provides services to related companies.[1] Since such types of transfers between related companies usually take place in the area of different tax jurisdictions, which do not have unified tax systems, the tax implications of transfer pricing come to the fore. Transfer pricing directly affects the level of business results of all companies in the group. Given that multinational companies generally operate in several countries, where profit tax rates differ, this leads to different taxation of profits in individual companies of the group. As the goal of every company, even multinational companies, is to maximize profits, profits are being shifted from countries with high tax rates to countries with lower tax rates. Thus, a difference between the actual economic activity of individual companies and their financial results may arise. Furthermore, control can also be one of the roles of transfer pricing, in terms of increasing a company's profits in the event that dividend payments are not allowed.[2] However, it should not be immediately assumed that companies want to manipulate transfer prices in order to influence profit increases and reduce the tax base. Companies can sometimes really have difficulty determining the market price of certain transactions.

[1] OECD (2017) OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2017, Paris, *OECD Publishing*, dostupno na: https://read.oecd-ilibrary.org/taxation/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-2017_tpg-2017-en#page5 (10.5.2021.)

[2] Gulin, D. (n.d.) Transferne cijene i njihove porezne implikacije, Ekonomski fakultet u Zagrebi, p.1, available at: https://www.efzg.unizg.hr/UserDocsImages/RAC/hpercevic/upravljacko_racunovodstvo/Transferne%20cijene.pdf (15.5.2021.)

The accelerating development and growth of the digital economy, as well as the emergence of specific services and transactions related to digitalization, significantly increases the complexity of multinational companies and their mutual business, which makes it difficult for companies themselves to determine mutual responsibilities and functions.[3] For multinational companies, it is important, among other things, to limit the risks that arise due to double taxation, i.e. disputes between countries over tax jurisdiction in the taxation of cross-border transactions of affiliated companies. Inconsistencies in national regulations and different interpretations of the rules of tax treaties concluded precisely to prevent double taxation often lead to the initiation of various proceedings. There are currently around 900 double taxation disputes in the European Union alone, valued at € 10.5 billion.[4] In the 2001 Company Tax Study, the Commission of the European Union identified the growing importance of transfer pricing issues in the European Union's internal market. Namely, the procedures conducted between the countries of the European Union harm the smooth functioning of the internal market of the European Union and create unnecessary costs for both companies and tax administrations.[5] Precisely for these reasons, even the largest economic organizations began to deal with the issue of transfer pricing and were among the first to point out the importance of defining a unique methodology for determining transfer prices. OECD is amongst the most successful in this regard, as its methodology is now accepted as an international standard in preventing possible abuses and double taxation of transfer prices at the international level.[6] One of the reasons why a uniform methodology at the global level is important is to ensure equality and fairness in paying taxes. Thus, most countries in the world agreed that the prices formed between related companies must be determined according to the prices that would be formed for the same transaction between unrelated companies. With this, the mentioned principle of pricing, better known as the principle of independence (Arm's lenght principal) became the basis for determining transfer prices in the world.[7]

2. ANALYSIS OF THE COMPLIANCE OF THE REGULATORY FRAMEWORK IN THE MEMBER STATES OF THE EUROPEAN UNION

This section will analyse the regulatory legislative framework of individual member states based on their profile published on the OECD website and the European Joint Transfer Pricing Forum. Member States' transfer pricing profiles focus on national legislation on key transfer pricing principles, including the arm's length principle, transfer pricing methods, comparability analysis, intangibles, intra-group services, cost contribution agreements, transfer pricing documentation, administrative approaches to dispute avoidance and resolution, safe harbours and other implementing measures. The information contained in these profiles is intended to clearly reflect the current state of countries' legislation and to what extent their rules follow the OECD transfer pricing guidelines. The following table shows the application and significance of the OECD Guidelines in individual EU Member States.

[3] OECD (2017) OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2017, Paris, OECD Publishing, available at: https://read.oecd-ilibrary.org/taxation/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-2017_tpg-2017-en#page5 (10.5.2021.)

[4] Službena stranica Europske unije, Resolution of tax disputes in the European Union, available at: https://ec.europa.eu/taxation_customs/business/company-tax/resolution-double-taxation-disputes_en_en#:~:text=Mutual%20agreement%20procedure%20(MAP)%20is,endeavour%20to%20resolve%20the%20dispute (15.5.2021.)

[5] An official website of European Union, Tranfer pricing in the EU context, available at: https://ec.europa.eu/taxation_customs/business/company-tax/transfer-pricing-eu-context_en

[6] Perčević, H. (2015) Usklađenost regulatornog okvira transfernih cijena u zemljama Europske Unije, *Ekonomska misao i praksa*, (2), 627-650. available at: https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=220341 (10.05.2021.)

[7] Perčević, H. (2015) Usklađenost regulatornog okvira transfernih cijena u zemljama Europske Unije, *Ekonomska misao i praksa*, (2), 627-650. available at: https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=220341 (10.05.2021.)

Table 1: Application of the OECD Guidelines in the Member States of the European Union

Member State	Application and significance of OECD Guidelines
Austria	OECD Guidelines from 1995 are published as official regulation in the Official Gazette of the Austrian Tax Administration.
Belgium	Belgian legislation includes specific guidance with reference to the OECD Guidelines.
Bulgaria	Although there is no specific reference to the OECD Guidelines in Bulgarian transfer pricing legislation, it generally follows them. However, there are some differences.
Cyprus	In practice, the OECD Guidelines are followed, but there is no specific reference in the legislation.
Czech Republic	The OECD guidelines are not directly applied in Czech legislation, but there are recommendations for their use.
Denmark	Danish legislation includes a direct reference to the OECD Guidelines in the explanatory notes.
Estonia	The OECD guidelines have no legal status in the Estonian tax system. However, according to Article 20 of Regulation no. 53, taxpayers and tax administrations are encouraged to use the Guidelines for those situations not covered by the Regulation, provided that they do not conflict with the Regulation.
Finland	OECD guidelines are referenced in Finnish transfer pricing regulations as a source of interpretation in the application of domestic legislation.
France	OECD guidelines are not prescribed by French domestic law or regulation. However, administrative doctrine explicitly refers to them.
Greece	The provisions of the Income Tax Act regarding transfer pricing are applied and interpreted in accordance with the general principles of the OECD and the OECD Guidelines for Transfer Pricing. OECD guidelines are also followed during procedures to avoid and resolve administrative disputes.
Croatia	Although there is no direct reference in Croatian legislation, the Croatian Tax Administration follows the OECD Transfer Pricing Guidelines.
Ireland	Irish domestic legislation is interpreted in accordance with the OECD Guidelines.
Italy	The Income Tax ACT refers directly to the OECD Guidelines and they are mentioned as best practice in the implementation of legal provisions regarding transfer pricing documentation requirements, as well as in the implementation of legal provisions supporting APAs.
Latvia	The OECD guidelines are used for the purpose of applying transfer pricing methods.
Lithuania	Lithuanian transfer pricing rules are largely in line with the OECD Guidelines, moreover, they recommend their use.
Luxembourg	There is a reference in domestic legislation to the OECD Guidelines. They form the framework of any transfer pricing analysis.
Hungary	Hungarian legislation is based on the OECD Guidelines and contains a direct reference to them.
Malta	In the absence of specific domestic legislation regarding transfer pricing guidelines, reference is made to the OECD Guidelines. However, they are not binding.
Netherlands	The OECD Guidelines are considered an internationally accepted explanation and clarification of the arm's length principle.
Germany	The OECD Guidelines are considered an internationally accepted explanation and clarification of the principle of an impartial transaction
Poland	The OECD transfer pricing guidelines are not part of Polish legislation but are used as an instrument of interpretation.
Portugal	The OECD Guidelines are referenced in the arm's length Portuguese legislation as a source of interpretation of the principle. The legislation states that the OECD Guidelines should be followed in a complementary way, especially when dealing with complex technical issues or in the absence of domestic legislation in certain areas.
Romania	Although Romania is not a member of the OECD, the legislation explicitly states that tax administrations must follow the OECD Guidelines.
Slovak Republic	The OECD guidelines are not legally binding but are acceptable as an instrument of interpretation.
Slovenia	The OECD Guidelines use taxpayers and tax administrations as a practical tool to determine the arm's length principle.
Spain	The OECD guidelines are recognized in the Preamble to the Income Tax Act as a source of interpretation of internal legislation.
Sweden	The legislation includes references to the OECD Guidelines.

Source: Made by the author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

It can be concluded from the table that all EU countries use the OECD Guidelines as a basis for transfer pricing regulation. However, some of these countries have included the Guidelines directly in their own legislative framework, while others use the Guidelines only as a basis for interpreting the provisions of their own legislation or as a complement to those areas of transfer pricing that are not covered by domestic legislation. Some of the countries themselves, such as Bulgaria, state that there are some differences between domestic legislation and the Guidelines, while others, such as Malta, state absence of transfer pricing domestic legislation. Even if it is clear that all Member States and their tax administrations follow the OECD Guidelines and use the main principles of the Guidelines, the interpretation and application of the Guidelines may vary from country to country. On the other hand, as the application of the Guidelines is not binding in most Member States, the question arises as to what extent the tax administrations will follow them. In order to analyse in more detail, the application of certain chapters of the Guidelines, some of the individual issues related to transfer pricing listed in the country profiles on the OECD website will be addressed below.

2.1. Arm's length principle

The first thematic unit of the profile of member states is related to the arm's length principle and the general application of the OECD guidelines in member states. The following table lists the regulations of individual countries that address the issue of the arm's length principle.

Table 2: The application of arm's length principle in the Member States of European Union

Member State	Application of arm's length principle	Regulation
Austria	Yes	Section 6., Paragraph 6. Income Tax Act
Belgium	Yes	Article 185 §2 BITC
Bulgaria	Yes	Chapter 4, Article 15 Corporate Income Tax Act
Cyprus	Yes	Article 33 Income Tax Act
Czech Republic	Yes	Section 23, Paragraph 7 Income Tax Act
Denmark	Yes	Section 2, Tax Assessment Act
Estonia	Yes	Section 10, Article 50, Subsection 4, Income Tax Act
Finland	Yes	Article 31, Assessment Procedure Act
France	Yes	Section 57 of the General Tax Code
Greece	Yes	Article 50 Income Tax Code
Croatia	Yes	Article 13 Income Tax Act
Ireland	Yes	Section 835C, Taxes Consolidation Act
Italy	Yes	Article 100, Paragraph 7 Income Tax Code
Latvia	Yes	Section 4, Paragraph 2, Subparagraph 2 Corporate Income Tax Act
Lithuania	Yes	Article 40 Corporate Income Tax Act
Luxembourg	Yes	Article 56 and 56bis Income Tax Act (LITL)
Hungary	Yes	Section 18 Corporate Tax and Dividend Tax
Malta	Yes	Article 5(6) Income Tax Management Act
Netherlands	Yes	Section 8b, Corporate Income Tax Act
Germany	Yes	Section 1, Foreign Tax Act Section 8, Paragraph 3 Corporation Taxes Act
Poland	Yes	Article 11, paragraph 1 Corporate Income Tax Act
Portugal	Yes	Article 63 Corporate Income Tax Act
Romania	Yes	Article 19 Fiscal Code
Slovak Republic	Yes	Section 17, Paragraph 5 Income Tax Act
Slovenia	Yes	Article 16 Corporate Income Tax Act
Spain	Yes	Article 18 Paragraph 1 Corporate Income Tax Act
Sweden	Yes	Section 14 Paragraph19 Income Tax Act

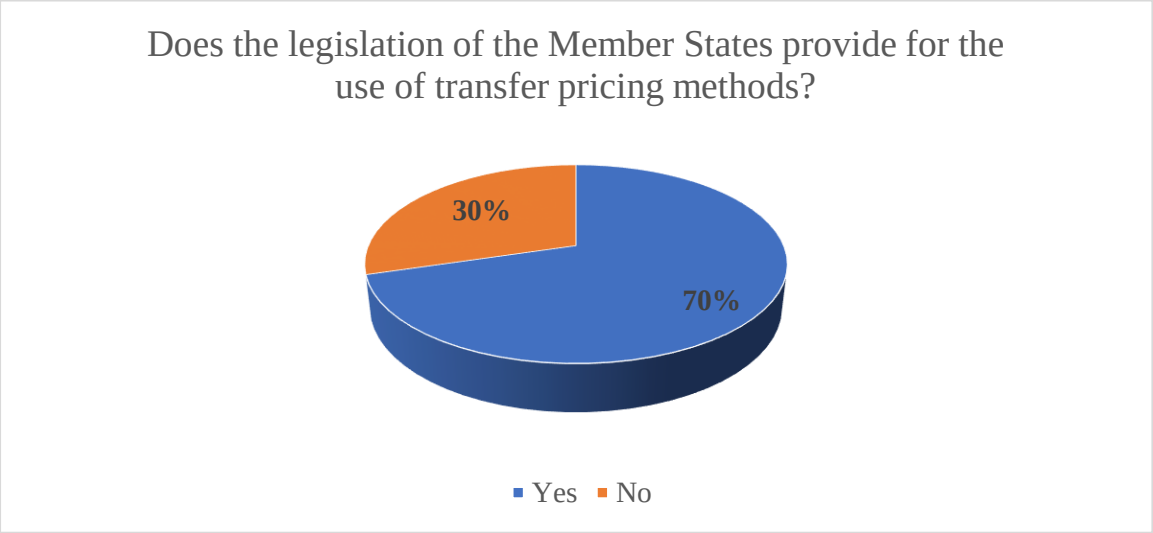
Source: Made by the author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

Given that all member countries apply the OECD Guidelines, it is logical that they also follow the arm's length principle. Most member states have this issue regulated by the Income Tax Act. However, there is no uniform definition of this principle specific to the European Union. This issue has been particularly highlighted in recent judgments of the European General Court concerning European Commission Decisions, which claimed that individual Member States benefited multinational companies through a reduced tax burden (in the context of transfer pricing) and characterized such benefits as illegal state aid. The General Court of the European Union confirmed that the Commission was entitled to use the arms' length principle as a tool to assess whether individual Member States granted selective advantages to individual multinational companies, i.e. that the Commission had jurisdiction to examine State aid in the context of arm's length principle.[8] It appears that such a judgment allows the Commission to review the treatment of transfer pricing in accordance with the arm's length principle, which would mean that each Member State must apply this principle whether or not it has introduced it into its legislation. Also, the continuation of this case law regarding the arm's length principle, creates the basis for the introduction of a single definition of the principle throughout the European Union.

2.2. Transfer pricing methods

Another important issue addressed as a thematic unit in Member States' transfer pricing profiles are transfer pricing methods. The analysis found that all Member States follow the OECD methodology in terms of methods, i.e. that they use the main five methods described in the OECD Guidelines. The following graph shows the percentage of countries whose legislation provides for the use of transfer pricing methods, i.e. the percentage of countries whose legislation has not introduced provisions on methods.

Graph 1: Does the legislation of the Member States provide for the use of transfer pricing methods?



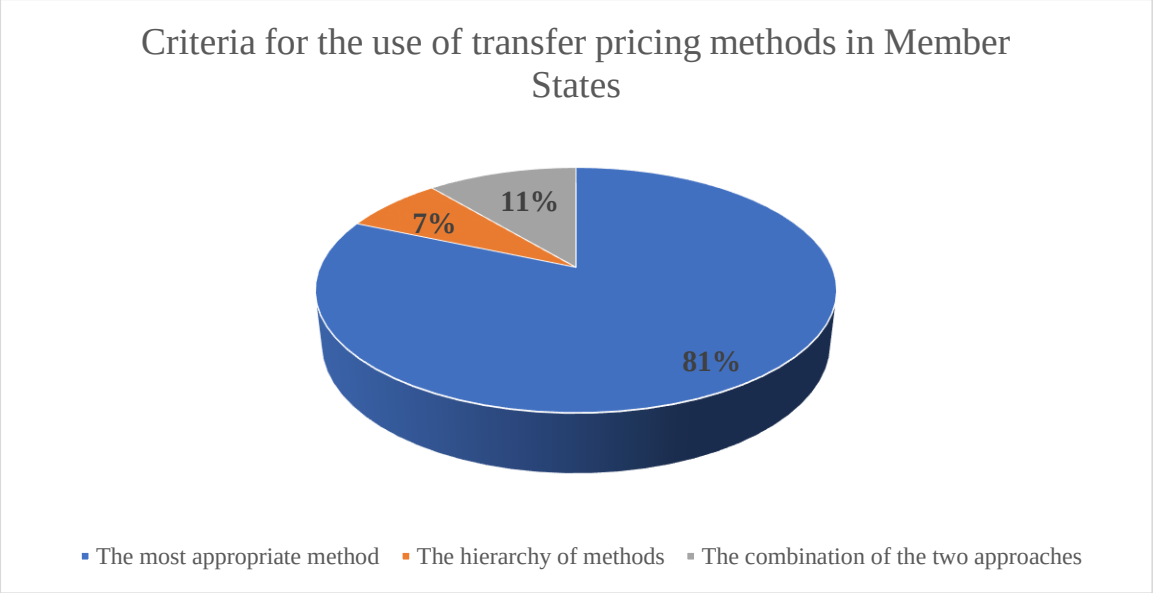
Source: Made by author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

As follows from the graph, 30% of countries, i.e. eight of them, do not have this issue regulated by their own legislation, but their tax administrations use the OECD Guidelines in practice or there is a direct reference to the Guidelines in the regulations when it comes to using transfer

[8] Presuda od 24. rujna 2019, Starbucks T-760/15 i T-636/16, ECLI:EU:T:2019:669, Zbornik Sudske prakse, str.21 available at: https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:62015TJ0760

pricing methods. Furthermore, the Guidelines state that when determining transfer pricing methods, the most appropriate method for a particular case should always be used. However, traditional transfer pricing methods are also mentioned as more reliable methods. The following graph shows the criteria used by Member States to select transfer pricing methods. This can be the use of the most appropriate method, the hierarchy of methods, or giving preference to certain methods, or a combination of these approaches.

Graph 2: Criteria for the use of transfer pricing methods in Member States



Source: Made by the author according to OECD, Transfer pricing country profiles, available at https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

It can be concluded from the graph that most countries use the criterion of the most appropriate method, i.e. they do not use priority methods when determining transfer pricing. In this context, it is important to note that 10 out of 27 Member States provide for the use of other transaction pricing methods in their legislation, in cases where it is not appropriate to use one of the five main methods described in the Guidelines. This actually means that in the case where a taxpayer uses one of the unofficial methods not listed in the Guidelines, he must prove that none of the five methods in the Guidelines is appropriate for determining the transfer price for a particular transaction. In addition, Estonia specifically states in its profile that it prefers the method of uncontrolled comparable prices as the most reliable, while Germany and Poland state that their legislation prefers traditional methods, which is actually in line with what the OECD Guidelines. Another question posed to Member States in this part of their profiles is the question of transfer pricing methods for transactions involving commodities. Most countries have not introduced specific regulations in this case but use the methodology described in Chapter II.18 of the Guidelines, which describes how to use the method of uncontrolled comparable prices for such goods.

2.3. Comparability analysis

Comparability analysis is discussed in Chapter III. of the OECD Guidelines and is also one of the topics of country profiles. Given that the comparability of controlled and uncontrolled transactions depends on several factors, including the economic situation, for which the geographical location is very important, some of the countries have made the use of domestic comparables a priority.

The following table shows the different approaches of Member States regarding this subject.[9]

Table 3: Priority given to domestic comparables

Member State	Domestic comparables are a priority	Comment
Austria	No	In accordance with the Austrian Transfer Pricing Guidelines, the use of comparables depends on the approach that provides the highest degree of comparability.
Belgium	No	-
Bulgari	Yes	Tipically domestic comparables are used because they are considered more reliable, as it is difficult to find other countries with a similar economic environment. However, in the absence of domestic comparables, the use of foreign ones is allowed.
Czech Republic	No	There is no specific regulation on this subject, but during administrative procedures, domestic comparables or comparables from similar markets are preferred.
Denmark	Yes	The guidelines regarding comparability analysis are fully in line with Chapter III. OECD Guideline.
Estonia	Yes	When comparing transactions, preference is given to transactions between the taxpayer and an unrelated company and to data from Estonian databases.
Finland	No	-
France	Yes	It is not prescribed in the regulations, however, in practice, due to the specifics of the domestic market, domestic comparables are preferred.
Greece	No	-
Croatia	Yes	It is not prescribed in the regulations, but if available, domestic comparables are used.
Ireland	No	In accordance with the EUTPD, Ireland uses European comparables. In the absence of European ones, other foreign comparables are also used.
Italy	No	-
Latvia	Yes	Domestic comparables, if appropriate, better reflect comparability factors and are more reliable. However, in practice a combination of domestic and foreign comparables is used.
Lethuania	No	-
Luxembourg	No	-
Hungary	Yes	Domestic comparables are used only in cases where foreign ones are not appropriate.
Malta	No	-
Netherlands	No	The tax authorities accept foreign comparables, unless geographical differences have a material impact on comparability.
Germany	No	-
Poland	Yes	A formal condition when preparing documentation is the use of domestic comparables as the first choice.
Portugal	No	Domestic comparables are priority only in cases where the controlled transactions being assessed involve conditions that are significantly related to the specific/exclusive characteristics of the domestic market.
Slovakia	Yes	It is not prescribed in the regulations, but in practice the general rule is to use domestic comparables first, and if this is not possible only then, the foreign ones.
Slovenia	Yes	If domestic comparables are available, their use is preferred. However, due to the small size of the Slovenian market, they are rarely available.
Spain	No	-
Sweden	No	-

Source: Made by the author according to OECD, Transfer pricing country profiles, available at https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

Following the above, it can certainly be concluded that most countries, at least in practice, prefer to use domestic comparables, which is logical given that some of the markets of the Member States are specific.

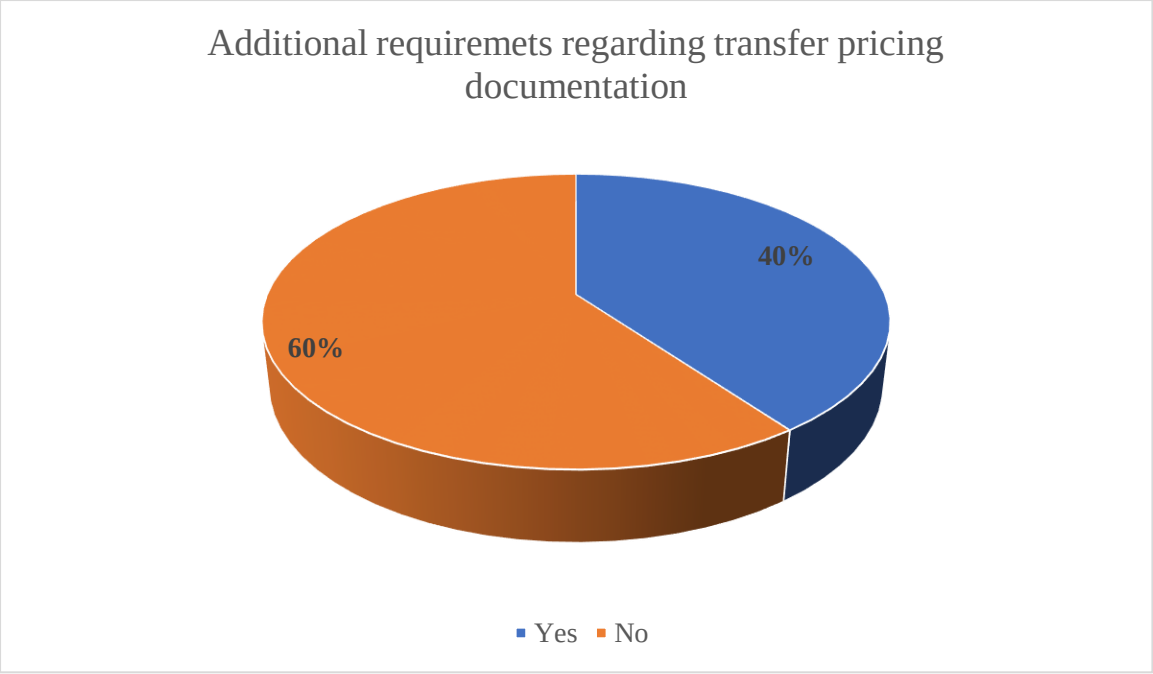
[9] Cyprus and Romania are not included in the analysis because the profiles from the Joint Forum do not cover this subject.

However, given the size of the European Union countries and their markets, many cite the problem of lack of data. Consequently, in practice it will happen that most countries use a combination of domestic and foreign comparables. When it comes to foreign comparables, European comparables should actually be used, as stated in the EUTPD.

2.4. Transfer pricing documentation

The subject of transfer pricing documentation is one of the most important when it comes to transfer pricing analysis, as it is used by taxpayers as proof that the transfer prices they use in related party transactions are in line with the arm's length principle, and tax administrations on the other hand as a tool to challenge those same prices if they find irregularities. As both the OECD Guidelines and the EUTPD suggest a similar approach to transfer pricing documentation, no major discrepancies are expected in the requirements of Member States' tax administrations. However, each of them may, in addition to the standardized approach, which includes the Master file, the Local file and Country to country reporting, require additional documentation from taxpayers.

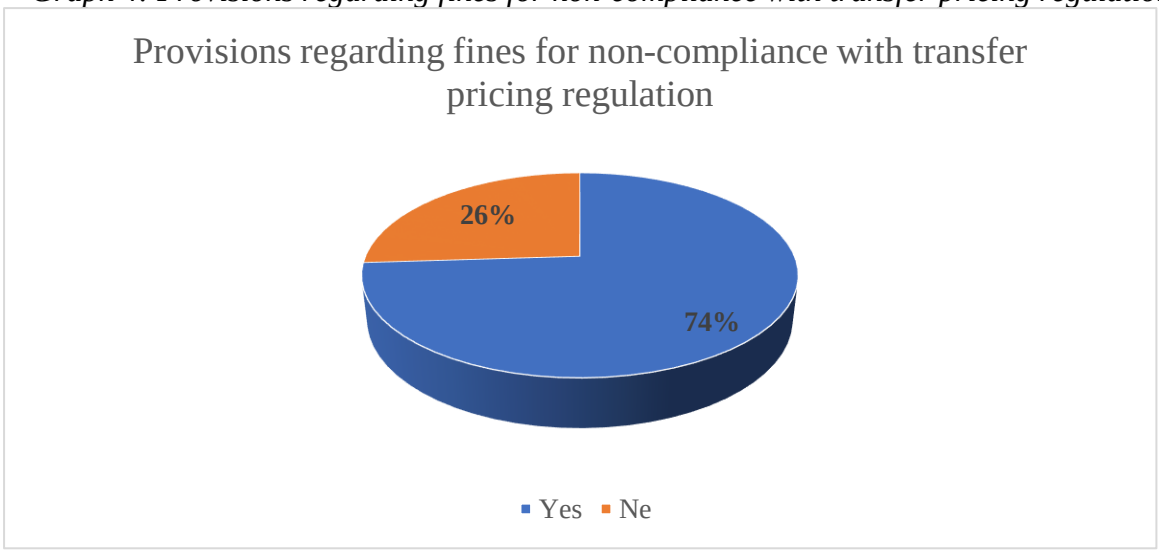
Graph 3: Additional requirements regarding transfer pricing documentation



Source: Made by the author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

40% of Member States have additional documentation requirements. Additional requirements include special tax returns that taxpayers must submit to the tax administration as an attachment to the income tax return, which lists transactions with related companies. In addition, in Greece, taxpayers must submit, along with transfer pricing documentation, a table summarizing the multinational company's group functions performed and risks assumed, as well as a brief description of the selected transfer pricing method. Furthermore, in Poland there is a requirement to submit a Statement on the preparation of transfer pricing documentation, which the taxpayer must submit together with the annual tax return, stating that on the day of submission of the Statement the documentation was prepared. The following graph shows the percentage of Member States fines specific to transfer pricing prescribed by their legislation, i.e. in the event that companies do not prepare transfer pricing documentation.

Graph 4: Provisions regarding fines for non-compliance with transfer pricing regulation



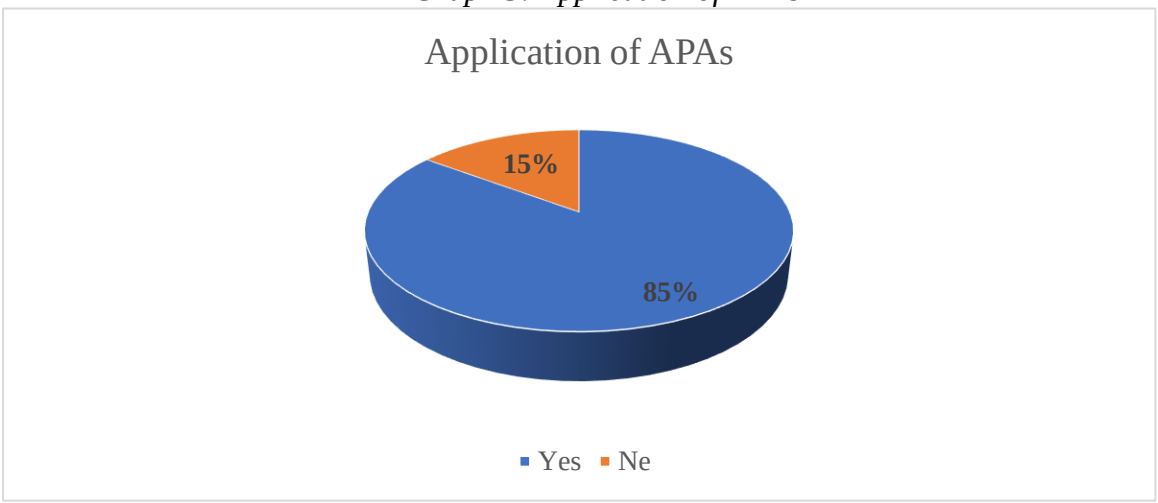
Source: Made by the author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

However, even those Member States that do not have specific penalties prescribed in the area of transfer pricing, can penalize companies that do not compile documentation based on misdemeanour provisions related to administrative proceedings. In this way, directly or indirectly, all Member States have penalties for non-compliance with the transfer pricing documentation requirements.

2.5. Administrative approaches to avoiding and resolving disputes

By analysing the profile of member states regarding the issue of administrative approaches to dispute prevention and resolution, we can conclude that all member states use the institute of Mutual agreement, the so-called MAP. The following graph shows the percentage of member states that use one of the forms of the Advanced transfer pricing agreements, the so-called APAs.

Graph 5: Application of APAs



Source: Made by the author according to OECD, Transfer pricing country profiles, available at: https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.02.2021)

As shown on the graph, it was concluded that 85% of Member States in their legal framework allow the application of Advanced transfer pricing agreements, while 15% which means 4 Member States do not have this option. Given the trends in the European Union, it is to be expected that the remaining members will soon introduce this way of avoiding disputes regarding transfer prices. In addition, as the complexity of transfer pricing analysis continues to grow, as do reporting requirements for tax administrations, APAs are becoming one of the most important ways for multinational companies to reduce transfer pricing risk, and it is therefore important for companies that all Member States implement this way of tax avoidance. Based on the analysis of the compliance of the regulatory framework of transfer pricing in the Member States of the European Union, it is concluded that its compliance is high. The analysis confirmed the following facts related to the regulation of transfer pricing in the European Union:

- All EU member states apply the OECD Guidelines and the principle of independent transaction on which they are based. There is no unified definition of the principle of impartial transaction in the European Union.
- All EU member states apply transfer pricing methods as defined in the OECD Guidelines.
- There is no unified definition of the principle of impartial transaction in the European Union.
- All EU member states require the preparation of transfer pricing documentation.
- 40% of Member States have additional requirements regarding the compilation of transfer pricing documentation.
- 74% of EU member states have introduced misdemeanour provisions regarding non-compliance with the provisions on compiling transfer pricing documentation.
- Only 15% of Member States, i.e. 4 of them, have not yet introduced the possibility of concluding advanced pricing agreements.

Although the analysis showed a high level of transfer pricing harmonization in the Member States, the fact that the application of the OECD Guidelines is not legally binding and that there are no uniform definitions of the main transfer pricing principles at EU level still leaves room for a large number of disputes between Member States on this issue. Apart from the fact that such a situation represents a cost for multinational companies and tax administrations, it certainly affects the internal market of the European Union.

3. CONCLUSION

With the development of multinational companies and the expansion of international business, the problem of transfer pricing also occurred. Transfer pricing includes prices that are formed when a company transfers goods or services to a related company. In order to meet the different objectives of a multinational group, affiliates often set prices and conditions in their mutual trade that do not correspond to market prices and conditions. One of the most current ways in which companies unrealistically use transfer pricing is to shift profits from the area of high tax burden to the area with lower tax burden, in order to maximize the overall profit of the group. On the other hand, as trade between affiliates takes place in two different countries that have differently regulated tax systems, companies face the problem of overlapping tax jurisdictions and the risk of double taxation. Over time, it has therefore become clear that it is necessary to establish a single international treatment of transfer pricing in order to minimize manipulation and injustice in taxation. As an international standard in the treatment of transfer pricing, many countries around the world have recognized the arm's length principle, which compares transactions between related companies with transactions that take place between unrelated companies and thus determines a fair range of transfer fees.

In an attempt to standardize the transfer pricing process, many international organizations have tried to get involved with their advice. The most successful in this was the OECD, whose Guidelines are globally considered the most reliable and widespread tool in regulating transfer pricing. Given all the above, it is clear how important mutual cooperation is, both between tax administrations between countries and tax administrations and companies. In addition, given the growing complexity of business and the number of countries in which individual multinational companies operate, from the point of view of the taxpayer it is important that the treatment of transfer pricing in countries is as harmonized as possible to reduce reporting complexity and costs arising from this issue. An analysis of the harmonization of the regulatory framework for transfer pricing in the European Union has shown that it is largely harmonized. All member countries follow the OECD Guidelines and the principle of impartial transactions, as well as the methods set out in the Guidelines. Also, documentation requirements are uniform in most countries, despite the fact that 40% of countries have additional documentation requirements. These additional requirements are not complex but are variations of the data that are already required in the standardized documentation or submitted with the income tax return. In the area of resolving and avoiding double taxation conflicts, progress has also been made and most countries have introduced previous transfer pricing agreements, which provide companies with some transfer pricing treatment in advance and reduce risk. Even for those countries that have not yet introduced this type of dispute avoidance, we can expect them to do so in the near future. Consequently, although there may be different understandings and applications of the OECD Guidelines followed by all member states, the regulatory framework for transfer pricing in the European Union is largely harmonized and the European Union's efforts in this regard can be interpreted as a sign that in the future could be regulated at the level of the entire European Union.

LITERATURE:

1. An official website of European Union (n.d.), Resolution of tax disputes in the European Union, available at: https://ec.europa.eu/taxation_customs/business/company-tax/resolution-double-taxation-disputes_en_en#:~:text=Mutual%20agreement%20procedure%20(MAP)%20is,endeavour%20to%20resolve%20the%20dispute (15.5.2021.)
2. An official website of European Union (n.d.), Transfer pricing in the EU context, available at: https://ec.europa.eu/taxation_customs/business/company-tax/transfer-pricing-eu-context_en (15.05.2021.)
3. Grgić, M., Bilas, V. (2008), Međunarodna ekonomija, Zagreb, Lares plus
4. Gulin, D. (n.d.) Transferne cijene i njihove porezne implikacije, Ekonomski fakultet u Zagrebu, available at: https://www.efzg.unizg.hr/UserDocsImages/RAC/hpercevic/upravljacko_racunovodstvo/Transferne%20cijene.pdf
5. Sopta, M. (2020). Upravljanje digitalnom transformacijom državnog poduzeća, Notitia - časopis za ekonomske, poslovne i društvene teme, 6(1), str. 39-48. https://doi.org/10.32676/n.6.1.4
6. OECD (2017) OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2017, Paris, *OECD Publishing*, available at: https://read.oecd-ilibrary.org/taxation/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-2017_tpg-2017-en#page5 (10.5.2021.)
7. OECD Transfer pricing country profiles, available at https: //www.oecd.org/tax/transfer-pricing/transfer-pricing-country-profiles.htm (10.05.2021)

8. Perčević, H. (2015) Usklađenost regulatornog okvira transfernih cijena u zemljama Europske Unije, Ekonomska misao i praksa, (2), 627-650, available at: https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=220341 (10.02.2021)
9. Presuda od 24. rujna 2019, Starbucks T-760/15 i T-636/16, ECLI:EU:T:2019:669, Zbornik Sudske prakse, available at: https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:62015TJ0760 (20.05.2021.)
10. Zbiljski, A. (2005) Transferne cijene uz egzistenciju čvrste proporcije, master's thesis, Ekonomski fakultet u Zagrebu
11. Zbiljski, A. (n.d.) Transferne cijene uz egzistenciju varijabilne proporcije, unpublished paper, Ekonomski fakultet u Zagrebu

INTELLECTUAL CAPITAL AND BUSINESS PERFORMANCE: IDENTIFICATION OF DIFFERENT RESEARCH DIRECTIONS

Tamara Smaguc
Teaching assistant, Faculty of Organization and Informatics, University of Zagreb, Pavlinska 2, Varaždin, Croatia
tamara.smaguc@foi.hr

ABSTRACT

This paper provides a unique systematization of previous empirical studies related to the impact of intellectual capital on business performance. The first part of the paper presents the definition of intellectual capital, discusses the concept of human, structural and customer capital (which are components of intellectual capital) and provides an overview of pioneering research related to the role of intellectual capital in modern business. Based on such a theoretical review, a basis for research was developed. In methodological terms, it was conducted by content analysis of existing scientific material. With the aim of systematizing and classifying existing research, a content analysis of over forty scientific papers, available in the Google Scholar database was conducted. The studies are categorized according to the method of determining (measuring) intellectual capital and the mechanism of expressing the performance of the company. Analysis resulted in the identification of four research directions in this area. Each paper is categorized into one of the following groups: (a) research that measure the intellectual capital of large enterprises using VAIC™, or similar indicators, and are based on data collected from secondary sources, (b) research that measure intellectual capital using a questionnaire developed by Bontis (1998), or similar survey questionnaires, and are based on data collected from primary sources, (c) research that are dealing with the impact of intellectual capital on SMEs performance, (d) research that examine the impact of intellectual capital on non-financial business performance. Given the abundance of quantitative opus and the heterogeneity of the findings, it can be concluded that this research area is saturated and requires guidance towards new, qualitative research directions.

Keywords: *company performance, intellectual capital, Nick Bontis, organisation performance, VAIC™*

1. INTRODUCTION

Intellectual capital appeared in the economic literature in 1969, when John Kenneth Galbraith in his work described it as something more than pure intellect, that is, as an embodied degree of intellectual action. According to him, intellectual capital does not present exclusively static intangible assets of the company, but is an ideological, dynamic process of developing new value (Kolaković, 2010; Bontis, 1998). The creator of the most famous definition of intellectual capital is Thomas A. Stewart, who wrote an influential article "Brainpower - How Intellectual Capital is becoming America's Most Valuable Asset" and thus significantly contributed to the popularization of this concept in the 1990s (Kolaković, 2010). Stewart (1997) defines intellectual capital as "an intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth" (Kolaković, 2010, p. 28; Fragouli, 2015, p. 37; Bontis, 1998, p. 65). Giving examples of organizations in the process of creating intellectual capital (Skandia, Dow Chemical, Hughes Aircraft, Polaroid), Stewart understands this concept as the sum of all the knowledge that exists in a company, from which its competitive advantage in the market springs (Stewart, 1991). According to Edvinsson (1997), it is possible to distinguish three basic components of intellectual capital. Therefore, the author proposes the following definition: "Intellectual capital = human capital + structural capital + customer capital" (Brennan and Connell, 2000, p. 220) where human capital includes the

knowledge, experience, abilities and skills of employees, and structural capital is the sum of the intangible components of an enterprise such as organizational structure, routines, business processes, customs, systems, and intellectual property. Finally, customer capital refers to the company's relationships and connections with various stakeholders, such as customers, suppliers and business partners (Kolaković, 2010). The role of intellectual capital in creating new value in modern business is the subject of a series of empirical studies conducted over the past twenty years. They mainly confirm the positive impact of intellectual capital, both on the financial performance of the company and on other dimensions of business quality. However, a large number of studies have led to the emergence of different thematic directions in this area. Also, different mechanisms for measuring intellectual capital and business performance have been developed. Therefore, the area calls for a clear overview of the existing empirical opus. This is precisely the goal of this paper. Methodologically the paper relies on the analysis of existing research and provides a comprehensive and systematic overview of the area. Based on this, a unique classification of research which are related to the role of intellectual capital in business operations is being developed. In the first part of the paper, the pioneering research of the intellectual capital of the company are presented and the research methodology is discussed. The second part of the paper is dedicated to the results of the analysis and conclusions. A systematic overview of the research that were analyzed is presented in the appendix of the paper.

2. PIONEERING RESEARCH INTO THE CONCEPT OF INTELLECTUAL CAPITAL

The first empirical studies on the impact of intellectual capital on company performance were prompted by estimates that managers in companies mainly focus on physical resources and other tangible assets, while neglecting intellectual assets whose value can be as much as three to four times higher (an exception to such an approach are the mentioned Scandia and several other large corporations). In addition to the above, empirical consideration of the role of intellectual capital has also been initiated by the emergence and strengthening of many knowledge-intensive industries such as information technology industry and consulting services, in which intellectual capital management is of particular importance (Bontis, 1998). These industries experienced expansion in the 1990s. One of the most famous researchers in the field of intellectual capital is Nick Bontis (Serenko and Bontis, 2004) who in 1998 developed a survey questionnaire - an instrument that allows quantification of human, structural and customer capital and provides an examination of the impact of these forms of capital on company performance. In measuring performance, his pilot study focuses on financial and other dimensions of business (he uses profit, profit growth, sales growth, net return on assets, net profit margin, position of companies in the industry, business forecasts, the rate of successfully introduced products and the overall assessment of business performance). The results of his research conducted on a sample of MBA students showed that intellectual capital has a significantly positive impact on a company's business performance (Bontis, 1998). Along with Bontis (1998), Ante Pulić made a significant contribution to the development of scientific empiricism related to the issue of intellectual capital. In 1998, in search of a more objective measure of intellectual capital, Pulić developed VAIC™ (Value Added Intellectual Coefficient) - a universal indicator of a company's intellectual ability to create value. The author perceives intellectual ability as the result of the engagement of physical capital and intellectual potential of the company. Namely, according to Pulić's original (1998) idea, VAIC™ represents the sum of value added created per unit of invested physical capital (VACA - Value Added Capital Coefficient) and value added created per dollar spent for employees (VAIP - Value Added Intellectual Potential) as a measure of efficiency of intellectual potential. Pulić (1998) defines intellectual potential as the ability of employees to contribute to the creation of value through

daily routines, by effectively using the company's infrastructure and developing intensive company relations with the market environment. As he states, intellectual potential differs from intellectual capital since the latter consists of three components (human, structural and customer capital) and is subjectively determined. The intellectual potential is clearly identifiable and is based on the real market results of the company (Pulić, 1998). Thus developed concept of measuring the company's performance Pulić (2008) was later elaborated and defined VAIC as the sum of the intellectual capital efficiency (ICE) and the efficiency of engaged (financial and physical) capital (CEE) where ICE represents the sum of human capital efficiency (HCE) and structural capital efficiency (SCE) (Kolaković and Holmik, 2006; Iazzolino and Laise, 2013).
After Bontis' (1998) and Pulić's (1998) contributions to the measurement of intellectual capital, the number of empirical studies examining the role of intellectual capital is continuously growing. However, existing studies are heterogeneous in terms of research areas, applied instruments, methods of measuring intellectual capital and techniques of determining business performance. In order to shed light on this area, a general research objective has been developed. It refers to the development of a comprehensive review of previous empirical knowledge related to the impact of intellectual capital on company performance. The general objective of the study is achieved through the following specific research goals:

1) To examine, identify and systematize the significant empirical studies related to the impact of intellectual capital on business performance
2) To classify studies with regard to the method of determining intellectual capital and the way of testing business performance, and describe each category of studies.

The research goals were achieved by developing and implementing the research methodology described below.

3. METHODOLOGY

In order to examine the objectives of the research, an content analysis (Krippendorff, 2004) of the existing scientific literature was performed. The selected database (Google Scholar) is initially searched using the keywords "intellectual capital", "intellectual capital company performance", "firm's intellectual capital". In the next step, relevant scientific papers based on the implementation of empirical research were selected. All found articles were reviewed and searched by keywords and their abstracts were read. Based on this, papers related to examining the impact of intellectual capital on company performance were identified. Such articles (41 in total) were analyzed in detail, with particular emphasis on identifying (a) the objectives of the empirical research, (b) the research methodology, (c) the characteristics of the sample, and (d) the key empirical findings. Based on that, the systematization and classification of the existing opus was carried out.

4. RESULTS

With regard to data sources and the measurement of intellectual capital, the majority of the observed empirical opus can be roughly classified into two groups:

- research that measure the intellectual capital of a company using VAIC™ or similar indicators and are based on data collected from secondary sources (financial reports of the company, annual reports, data from the capital market)
- research that measure intellectual capital (or its individual components) using the Bontis (1998) questionnaire or similar survey questionnaires and are based on data collected from primary sources (for example, surveys of senior and middle management of the company).

Most of the analyzed studies focus on examining the relationship between intellectual capital and financial performance of companies measured by traditional indicators such as return on

assets (ROA), return on equity (ROE), turnover and the market to book ratio (Firer and Stainbank, 2003; Riahi-Belkaoui, 2003; Tseng and James Goo, 2005; Chen et al., 2005; Wang and Chang, 2005; Tan et al., 2007; Iswati and Anshori, 2007; Appuhami, 2007; Gan and Saleh, 2008; Bharathi Kamath, 2008; Chan, 2009; Puntillo, 2009; Zéghal and Maaloul, 2010; Maditinos et al., 2011; Ahangar, 2011; Phusavat et al., 2011; Clarke et al., 2011; Mondal and Ghosh, 2012; Alipour, 2012; Mehralian et al., 2012; Joshi et al., 2013). However, some of the observed studies, in addition to the impact on financial performance, consider the impact of intellectual capital on other dimensions of business performance, such as the ability of the firm to develop new products, innovation capacity, human resource management practices and others (Bontis et al., 2000; Engström et al., 2003; Bollen et al., 2005; Subramaniam and Youndt, 2005; Chen et al., 2006; Bramhandkar, 2007; Huang and Hsueh, 2007; Hsu and Fang, 2008; F-Jardón and Martos, 2009; Yun Lin, 2009; Sharabati et al., 2010; Kamukama et al., 2011; Abdullah and Sofian, 2012). It is also important to mention that most of the research on this topic relate to empirical studies conducted on samples of large companies. However, in several papers the same issue has been studied in a sample of SMEs (Peña, 2002; Cohen and Kaimenakis, 2007; F-Jardón and Martos, 2009; Cleary and Quinn, 2016) which is particularly important given the fact that many knowledge-based firms belong to the category of micro-enterprises or small enterprises. Table 1 in the appendix of the paper provides an overview of about forty selected studies examining the impact of intellectual capital on company performance. The presented papers are categorized into several groups according to the method of measuring intellectual capital (VAIC^{TM} or similar indicators/survey questionnaires) and the examined performance (traditional financial performance/other performance). Research that examine the issue of the impact of intellectual capital on performance of small and medium-sized enterprises are classified into a separate category. A summary of the empirical findings for each research direction is discussed below.

4.1. The impact of intellectual capital on financial performance (Pulić's model)

For the last fifteen years, the scientific discourse thematically related to intellectual capital has been replete with empirical research examining the relationship between intellectual capital (measured by Pulić's VAIC^{TM} model) and the financial performance of companies. These studies most often focus on a narrower geographical area (national or regional) and mainly consider a sample of large companies whose shares are listed on a regulated capital market. Despite the different characteristics of the samples over which they were conducted, the observed studies found the same or similar results. Specifically, almost all studies have partially or fully confirmed the hypotheses about a significant positive relationship between a firm's intellectual capital and its financial performance. A review of these studies suggests that despite a few exceptions (Chan, 2009; Puntillo, 2009; Zéghal and Maaloul, 2010;), most studies have found that intellectual capital has a significant positive effect on firm performance measured by profitability and labor productivity. At the same time, studies based on a sample of companies from several industries found that the intensities of the impact of intellectual capital on performance vary considerably among industries. Furthermore, the evidence on the impact of intellectual capital on the market value of firms is not as strong as in the case of profitability and productivity. This mainly depends on external factors, such as the characteristics of the capital market and the development of the reporting system in each country. Finally, findings on the impact of individual components of intellectual capital on performance are very heterogeneous. Some studies have found the cruciality of human capital, while others have concluded that firms still rely heavily on the classical, physical form of capital in achieving high financial performance. Finally, it should be mentioned that the diversity of the findings is, among other things, a consequence of the different samples on which the research were conducted.

Therefore, the results cannot be fully generalized but should be considered taking into account the geographical and temporal context and the characteristics of the industry in which the specific research was conducted.

4.2. The impact of intellectual capital on financial and organizational performance (survey questionnaire created by Nick Bontis)

The second group of research deals with the issue of the relationship between intellectual capital as an independent variable and the business performance as a dependent variable, based on primary data collected through survey questionnaires. Among the various questionnaires, the most commonly used is the "IC questionnaire" developed and originally applied by Nick Bontis in 1998. His questionnaire consists of a total of 63 statements that measure the level of human, structural and relational capital and the financial and organizational performance of a company. The questionnaire is based on the Likert scale with seven points. As mentioned, Bontis (1998) conducted the initial research on a sample of 64 MBA students from the University of Western Ontario in Canada and found a valid, reliable and significant link between the dimensions of intellectual capital and enterprise performance (Bontis, 1998). Following Bontis (1998), research based on data from survey questionnaires were also conducted by Bonis et al. (2000), Engström et al. (2003), Bollen et al. (2005), Huang and Hsueh (2007), Cabrita and Bontis (2008), Kamukama et al. (2010), Namvar et al. (2010), Sharabati et al. (2010) and Abdullah and Sofian (2012). Although they mostly relied on the Bontis questionnaire, the measurement instruments used in these studies differed somewhat. Therefore, when it comes to the impact of intellectual capital on performance, different studies have found heterogeneous results. For example, Bollen et al. (2005) in the pharmaceutical industry in Germany, Namvar et al. (2010) in the computer and electronics industry in Iran and Kamuka et al. (2010) on a sample of microfinance institutions in Uganda found a positive impact of all components of intellectual capital on performance. The impact of IC on performance can be direct (Namvar et al., 2010) or indirect (Bollen et al., 2005), through the direct impact of IC on intellectual property, which in turn directly affects performance. On the other hand, Engström et al. (2003) conducted research in the hotel industry using the ICAP methodology. The authors confirmed the findings of Bonitis et al. (2000) on the significant positive impact of structural capital on performance. But at the same time, they concluded that the impact of intellectual capital (total ICAP) on financial performance is not statistically significant. Huang and Hsueh (2007) in turn conducted the analysis on a sample of 101 engineering consulting firms in Taiwan. According to their findings, only relational capital (as one of the three components of intellectual capital) directly affects financial performance while the impact of human capital on financial performance is indirect.

4.3. The impact of intellectual capital on the performance of small and medium-sized enterprises

While most of the previously presented studies dealt with the issue of intellectual capital in large companies (mostly those listed on the regulated capital market), a few of them analyzed the same or similar research questions on samples of small and medium-sized enterprises (SMEs). Recognizing the importance of SMEs, the mentioned research are singled out and separately analyzed (small and medium-sized enterprises make up 99.8% of the total non-financial sector of the European Union and employ two thirds of the European workforce (Vuković, 2012, pp. 28-29)). Also, SMEs apply different models of organizational practices which potentially means different importance of individual components of intellectual capital than those found by empirical analyzes conducted on samples of large enterprises (Cohen and Kaimenakis, 2007).

In an effort to examine the impact of intellectual capital components on the financial, organizational, and innovation performance of SMEs, F-Jardón and Martos (2009) conducted a study on a sample of 113 producers in the wood industry in Argentina. The authors concluded that structural capital is the only component of intellectual capital that directly positively affects firm performance while the impact of other components (human capital and relational capital) is indirect (F-Jardón and Martos, 2009). A very interesting study was conducted by Peña (2002) dealing with the initial phase of a company's life cycle. In particular, using a sample of 101 companies in Spain, the author examined and confirmed the positive impact of the components of intellectual capital (human, organizational and relational capital) on the viability and growth of start-up entrepreneurs. Peña (2002) concluded that new entrepreneurs focus mainly on acquiring visible forms of assets (such as business premises, equipment, and financial resources). However, start-ups should never underestimate elements such as education, motivation, implementing appropriate strategies, responding quickly to change, and building a productive business network and good relationships with all stakeholders, as these elements can play a key role in surviving a new business. In conclusion, it should be noted that the findings of the observed research examining the impact of intellectual capital on the performance of small and medium-sized enterprises generally do not deviate from the conclusions of most similar studies conducted on samples of large enterprises.

4.4. The impact of intellectual capital on the other (non-financial) performance

Research based on the application of Pulić's model mainly considered the financial performance of companies, while those based on survey questionnaires in addition to financial performance took into account some of the organizational performance (although they were not the explicit focus of the research). However, a smaller group of studies focused on examining the impact of intellectual capital on specific organizational performance, such as innovation capacity, a company's ability to introduce new products, and an organization's learning ability. For example, Subramaniam and Youndt (2005) examined the impact of different components of intellectual capital (human, organizational, and social capital) on a company's innovation capacity. The authors concluded that the individual expertise of employees, ie human capital in itself is not sufficient for radical innovation. Moreover, hesitating to share knowledge among independent and unrelated professionals within the company has a counterproductive impact on innovation. According to their results, high innovation capacity is a consequence of networking, sharing and channeling individual knowledge through social networks, which is actually a synergistic use of human and social capital (Subramaniam and Youndt, 2005). Furthermore, Chen et al. (2006) and Hsu and Fang (2008) examined the impact of intellectual capital on firm performance related to new product development. According to the findings of Chen et al. (2006), all three components of intellectual capital (human, structural, and relational) have a significantly positive impact on ability to develop new products. The strongest impact was found in the case of relational capital, where the impact of IC on ability to develop new products is stronger as the industry achieves higher growth rates. On the other hand, Hsu and Fang (2008) found a significant positive relationship only in the case of human and (indirectly) relational capital. The direct link between structural capital and the ability to develop new products in their study is negative. Therefore, the authors concluded that excessive expenditure on information technology in enterprises can counterproductively affect the development of new products. In addition, in the same study Hsu and Fang (2008) found that all components of intellectual capital have a significant positive effect on an organization's learning ability. The goals of the previously presented studies are quite heterogeneous. However, it can be concluded that they have proven that certain components of intellectual capital not only affect financially determinable performance, but are also important predictors of different non-financial performance of companies.

5. CONCLUSION

This paper provides an overview and analysis of over forty empirical studies that address the issue of the impact of intellectual capital on company performance. With regard to the method of determining intellectual capital, studies are initially roughly categorized into two groups (1) those that measure intellectual capital using VAIC^{TM} or similar indicators and are based on data collected from secondary sources, and (2) those that determine intellectual capital using Bontis (1998) or similar survey questionnaires and are based on data collected from primary sources. Also, in their own categories are selected studies that examine the issue of the impact of intellectual capital on performance on a sample of small and medium-sized enterprises and studies that do not focus on financial but on other, non-financial performance of enterprises. After reviewing the findings of various studies, it was concluded that most of the analyzed studies based on the application of Pulić's model show that intellectual capital has a significant positive effect on company performance measured by profitability and labor productivity. On the other hand, research based on the application of survey questionnaires find that certain components of intellectual capital, especially structural capital, have a positive effect on financial and organizational performance. In addition, it was found that the findings of the observed studies examining the impact of intellectual capital on the performance of small and medium-sized enterprises generally do not deviate from the conclusions of most similar studies conducted on samples of large enterprises. Finally, it was concluded that it has been empirically proven that intellectual capital affects other company performance, such as innovation capacity, ability to develop new products, and organizational learning capabilities. Since there is a lot of research and their findings are quite heterogeneous, the conducted systematization and classification significantly contributes to the understanding of the field, but also reveals potential new research directions. Unlike existing quantitatively oriented research, the new directions should examine the role of intellectual capital in business using a deep, qualitative research lens. A qualitative approach would ensure a shift in the development of an understanding of internal corporate processes related to the creation and engagement of human, structural and customer capital of a company. It would also provide insight into the contribution of intellectual capital in the creation and quality of the company's relationship with the environment.

LITERATURE:

1. Abdullah, D. F., Sofian, S. (2012). The Relationship between Intellectual Capital and Corporate Performance, *Procedia - Social and Behavioral Sciences*, 40, pp. 537 – 541.
2. Ahangar, R. G. (2011). The relationship between intellectual capital and financial performance: An empirical investigation in an Iranian company, *African Journal of Business Management*, 5 (1), pp. 88-95.
3. Alipour, M. (2012). The effect of intellectual capital on firm performance: an investigation of Iran insurance companies, *Measuring Business Excellence*, 16 (1), pp. 53-66.
4. Appuhami, B.A.R. (2007). The Impact of Intellectual Capital on Investors' Capital Gains on Shares: An Empirical Investigation of Thai Banking, Finance & Insurance Sector, *International Management Review*, 3 (2), pp. 14-25.
5. Bharathi Kamath, G. (2008). Intellectual capital and corporate performance in Indian pharmaceutical Industry, *Journal of Intellectual Capital*, 9 (4), pp. 684 – 704.
6. Bollen, L., Vergauwen, P., Schnieders, S. (2005). Linking Intellectual Capital and Intellectual Property to Company Performance, *Management Decision*, 43 (9), pp. 1161-1185.
7. Bontis, N. (1998). Intellectual Capital: An exploratory study that develops measures and models, *Management Decision*, 36 (2), pp. 63-76.

8. Bontis, N., Chua, W., Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries, *Journal of Intellectual Capital*, 1 (1), pp. 85-100.
9. Bramhandkar, A., Erickson, S., Applebee, I. (2007). Intellectual Capital and Organizational Performance: an Empirical Study of the Pharmaceutical Industry, *The Electronic Journal of Knowledge Management*, 5 (4), pp. 357 – 362.
10. Brennan, N., Connell, B. (2000). Intellectual capital: current issues and policy implications, *Journal of Intellectual Capital*, 1 (3), pp. 206 – 240.
11. Cabrita, M.R., Bontis, N. (2008). Intellectual capital and business performance in the Portuguese banking industry, *Int. J. Technology Management*, 43 (1-3), pp. 212-237.
12. Chan, K. H. (2009). Impact of intellectual capital on organisational performance, *The Learning Organization*, 16 (1), pp. 22 – 39.
13. Chen, J., Zhu, Z., Yuan Xie, H. (2004). Measuring intellectual capital: a new model and empirical study, *Journal of Intellectual Capital*, 5 (1), pp. 195 – 212.
14. Chen, M.C., Cheng, S.J., Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance, *Journal of Intellectual Capital*, 6 (2), pp. 159 – 176.
15. Chen, Y., Lin, M.J., Chang, C. (2006). The Influence of Intellectual Capital on New Product Development Performance – The Manufacturing Companies of Taiwan as an Example, *Total Quality Management & Business Excellence*, 17 (10), pp. 1323-1339.
16. Clarke, M., Seng, D., Whiting, R.H. (2011). Intellectual capital and firm performance in Australia, *Journal of Intellectual Capital*, 12 (4), pp. 505 – 530.
17. Cleary, P., Quinn, M. (2016). Intellectual capital and business performance, *Journal of Intellectual Capital*, 17 (2), pp. 255 – 278.
18. Cohen, S., Kaimenakis, N. (2007). Intellectual capital and corporate performance in knowledge intensive SMEs, *The Learning Organization*, 14 (3), pp. 241 – 262.
19. Edvinsson, L. (1997). Developing intellectual capital at Skandia, *Long Range Planning*, 30 (3), pp. 266-373.
20. Engström, T.E.J., Westnes, P., Westnes, S. F. (2003). Evaluating intellectual capital in the hotel industry, *Journal of Intellectual Capital*, 4 (3), pp. 287 – 303.
21. F-Jardón, C.M., Martos, M.S. (2009). Intellectual capital and performance in wood industries of Argentina, *Journal of Intellectual Capital*, 10 (4), pp. 600 – 616.
22. Firer, S., Stainbank, L. (2003). Testing the relationship between intellectual capital and a company's performance: Evidence from South Africa, *Meditari Accountancy Research*, 11, pp. 25–44.
23. Fragouli, E. (2015). Intellectual Capital & Organizational Advantage: an economic approach to its valuation and measurement, *International Journal of Information, Business and Management*, 7 (1), pp. 36-57.
24. Gan, K., Saleh, Z. (2008). Intellectual Capital and Corporate Performance of Technology-Intensive Companies: Malaysia Evidence, *Asian Journal of Business and Accounting*, 1 (1), pp. 113-130.
25. Hsu, Y., Fang, W. (2009). Intellectual capital and new product development performance: The mediating role of organizational learning capability. *Technological Forecasting & Social Change*, 76, pp. 664–677.
26. Huang, C.F., Hsueh, S.L. (2007). A study on the relationship between intellectual capital and business performance in the engineering consulting industry: A path analysis, *Journal of Civil Engineering and Management*, 13 (4), pp. 265-271.
27. Iazzolino, G., Laise, D. (2013). Value added intellectual coefficient (VAIC), *Journal of Intellectual Capital*, 14 (4), pp. 547 – 563.

28. Iswati, S., Anshori, M. (2007). The Influence of Intellectual Capital to Financial Performance at Insurance Companies in Jakarta Stock Exchange (JSE), *Proceedings of the 13th Asia Pacific Management Conference* (pp. 1393-1399), Melbourne, Australia.
29. Joshi, M., Cahill, D., Sidhu, J., Kansal, M. (2013). Intellectual capital and financial performance: an evaluation of the Australian financial sector, *Journal of intellectual capital*, 14 (2), pp. 264-285.
30. Kamukama, N., Ahiauzu, A., Ntayi, J.M. (2010). Intellectual capital and performance: testing interaction effects, *Journal of Intellectual Capital*, 11 (4), pp. 554 – 574.
31. Kamukama, N., Ahiauzu, A., Ntayi, J.M. (2011). Competitive advantage: mediator of intellectual capital and performance, *Journal of Intellectual Capital*, 12 (1), pp. 152 – 164.
32. Kolaković, M. (2010). *Virtualna ekonomija – kako poslovati u uvjetima globalne krize*. Zagreb: Strategija d.o.o.
33. Kolaković, M., Holmik, D. (2006). The Efficiency Analysis of Croatian Sugar Industry by using the concept of Intellectual Capital, *Agriculturae Conspectus Scientificus*, 71 (1), pp. 27-35.
34. Krippendorff, K. (2004). *Content Analysis: An Introduction to Its Methodology* (2nd edition). Thousand Oaks, London, New Delhi: SAGE Publications.
35. Maditinos, D., Chatzoudes, D., Tsairidis, C., Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance, *Journal of intellectual capital*, 12 (1), pp. 132-151.
36. Mehralian, G., Rajabzadeh, A., Sadeh, M., Rasekh, H. (2012). Intellectual capital and corporate performance in Iranian pharmaceutical industry, *Journal of Intellectual Capital*, 13 (1), pp. 138 – 158.
37. Mondal, A., Ghosh, S. K. (2012). Intellectual capital and financial performance of Indian Banks, *Journal of Intellectual Capital*, 13 (4), pp. 515 – 530.
38. Namvar, M., Fathian, M., Akhavan, P., Reza, G.M. (2010). Exploring the impacts of intellectual property on intellectual capital and company performance: The case of Iranian computer and electronic organizations, *Management Decision*, 48 (5), pp. 676-697.
39. Peña, I. (2002). Intellectual capital and business start-up success, *Journal of Intellectual Capital*, 3 (2), pp. 180 – 198.
40. Phusavat, K., Comepa, N., Sitko-Lutek, A., Ooi, K. (2011). Interrelationships between intellectual capital and performance, *Industrial Management & Data Systems*, 111 (6), pp. 810 – 829.
41. Pulić, A. (1998). Measuring the Performance of Intellectual Potential in Knowledge Economy, In T. Carver, S. Jennifer – Hamilton (ed.). *19th Annual National Business Conference*. Kanada: McMaster university, Michael G. DeGroote School of Business.
42. Pulić, A. (2008). *The Principles of Intellectual Capital Efficiency*. A brief Description, Croatian Intellectual Capital Center, Zagreb. Retrieved 28th April 2016 from http://www.cik-hr.com/data/principles_2008.pdf.
43. Puntillo, P. (2009). Intellectual Capital and business performance. Evidence from Italian banking industry, Журнал, *Корпоративные Финансы*, 4(12), pp. 97–115.
44. Riahi-Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms, *Journal of Intellectual Capital*, 4 (2), pp. 215 – 226.
45. Serenko, A., Bontis, N. (2004). *Meta-Review of Knowledge Management and Intellectual Capital Literature*, Management of Innovation and New Technology Research Centre, Working Paper no. 112. Retrieved 28th April 2016 from https://macsphere.mcmaster.ca/bitstream/11375/17698/1/mint_wp_112.pdf
46. Sharabati, A.A., Jawad, S.N., Bontis, N. (2010). Intellectual Capital and Business Performance in the Pharmaceutical Sector of Jordan, *Management Decision*, 48 (1), pp. 105-131.

47. Stewart, T. A. (1991). *Brainpower - Intellectual capital is becoming corporate America's most valuable asset and can be its sharpest competitive weapon*. The challenge is to find what you have -- and use it. Fortune. Retrieved 26th April 2016 from http://archive.fortune.com/magazines/fortune/fortune_archive/1991/06/03/75096/index.htm.
48. Subramaniam, M., Youndt, M. A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities, *The Academy of Management Journal*, 48 (3), pp. 450-463.
49. Tan, H.P., Plowman, D., Hancock, P. (2007). Intellectual Capital and Financial Returns of Companies, *Journal of Intellectual Capital*, 8 (1), pp. 76-95.
50. Tseng, C. Y., Goo, Y.J. (2005). Intellectual capital and corporate value in an emerging economy: empirical study of Taiwanese manufacturers, *R&D Management*, 35 (2), pp. 187-201.
51. Vuković, K. (2012). *Mala i srednja poduzeća u Europskoj uniji*, Varaždin: Fakultet organizacije i informatike.
52. Wang, W. Y., Chang, C. (2005). Intellectual Capital and Performance in Causal Models Evidence from the Information Technology Industry in Taiwan, *Journal of Intellectual Capital*, 6 (2), pp. 222-236.
53. Yang, C.-C., Lin, C. Y. (2009). Does intellectual capital mediate the relationship between HRM and organizational performance? Perspective of a healthcare industry in Taiwan, *The International Journal of Human Resource Management*, 20 (9), pp. 1965-1984.
54. Zéghal, D., Maaloul, A. (2010). Analysing value added as an indicator of intellectual capital and its consequences on company performance, *Journal of intellectual capital*, 11 (1), pp. 39-60.

APPENDIX

Table 1: Overview of empirical research on the impact of intellectual capital on firm performance (Source: own elaboration)

Id.	Year	Autor(s)	Sample	Research objectives	Empirical results
Secondary data research: Examining the impact of intellectual capital (measured using VAIC™) on a company's financial performance					
1	2003	Firer and Stainbank	sample of 65 knowledge-intensive companies in South Africa listed on the JSE Securities Exchange (secondary data from the 2001 annual reports)	examining the impact of intellectual capital on company performance (measured by profitability, productivity and market value)	There is a positive link between intellectual capital and the profitability and productivity of a company. The link between the intellectual capital and the market value of the enterprise has not been identified.
2	2005	Tseng and James Goo	sample of the 500 largest producers (according to the criterion of sales revenue) listed on the stock exchange in Taiwan (secondary data and survey questionnaire)	examining the relationship between the four components of intellectual capital (human, organizational, innovation and relational capital) and the relationship between intellectual capital and company value	A significantly positive relationship was found between the intellectual capital and the value of the company.
3	2005	Chen, Cheng and Hwang	sample of 4,254 observations for companies listed on the Taiwan Stock Exchange for the period 1992-2002 (secondary data)	examining the impact of intellectual capital on market value, and current and future financial performance	Intellectual capital has a positive effect on the market value and current financial performance of the observed companies and is a good indicator of their future performance.
4	2007	Tan, Plowman and Hancock	sample of 150 companies listed on the Singapore Exchange for the period 2000-2002 (secondary data)	examining the impact of intellectual capital on the financial performance of companies (ROE, EPS, ASR)	There is a significant positive relationship between intellectual capital and financial performance of enterprises, but the contribution of intellectual capital to performance varies among industries (the relationship is strongest in the services and real estate sectors, and weakest in the trade sector).
5	2007	Iswati and Anshori	sample of 7 insurance companies listed on the Jakarta Stock Exchange (secondary data)	Examining the impact of intellectual capital on the financial performance of a company.	Intellectual capital has a significant positive effect on financial performance.
6	2007	Appuhami	sample of 33 companies (banks, insurance companies and other financial institutions) in Thailand (secondary data)	examining the impact of intellectual capital on the amount of capital gains of shareholders	The intellectual capital of a company has a significant positive effect on the amount of capital gains of shareholders.
7	2008	Gan and Saleh	sample of 89 technology-intensive companies in Malaysia (listed on the Bursa Malaysia) for the period 2004-2005 (secondary data)	examining the relationship between intellectual capital and company performance (profitability, productivity and market value)	A significant positive relationship was found between intellectual capital and profitability and productivity, but not the market value of the firm. Among the components of intellectual capital, profitability is most strongly influenced by physical capital, and productivity by human capital.
8	2008	Bharathi Kamath	sample of 25 companies from the pharmaceutical industry in India for the period 1996-2006 (secondary data)	examining the impact of elements of intellectual capital (human, structural and physical capital) on financial performance (profitability, productivity and market value)	Human capital has the strongest impact on the profitability and productivity of the surveyed companies. The links between intellectual capital and firm performance variables are not significant.
9	2009	Chan	sample of 33 companies that constitute the Hang Seng Index (Hong Kong Stock Exchange) for the period 2001-2005 (secondary data)	examining the impact of intellectual capital on the financial performance of the company (productivity, profitability, market value and return on capital).	No significant link was found between intellectual capital and company performance. Among the components of intellectual capital (human, physical, structural capital), physical capital has the strongest impact on the profitability, productivity and market value of the observed companies.

Id.	Year	Autor(s)	Sample	Research objectives	Empirical results
10	2009	Puntillo	sample of 21 banks listed on the Milan Stock Exchange, data used for the period 2005-2007 (secondary data)	examining the relationship between the intellectual capital and financial performance of the company and the relationship between efficiency (corporate value creation efficiency) and the market to book ratio of the company	A weak link was found between intellectual capital and financial performance measured by profitability. A negative link was found between the intellectual capital and the market to book ratio of the company, which can be attributed to the imperfection of the capital market in Italy.
11	2010	Zéghal and Maaloul	sample of 300 companies in the UK from three industries (high technology, traditional and service sector) listed on the London Stock Exchange (LSE) in 2005 (secondary data)	examining the role of added value as an indicator of intellectual capital and its impact on the economic, financial and market performance of enterprises	Intellectual capital has a significantly positive impact on the economic and financial performance of a company, but the link between intellectual capital and market performance is significant only for the high-tech sector.
12	2011	Maditinos, Chatzoudes, Tsairidis and Theriou	sample of 96 companies from four sectors in Greece listed on the Athens Stock Exchange, data used for the period 2006-2008 (secondary data)	examining the impact of intellectual capital on the financial performance of the company (profitability, sales growth and market value)	There is a positive significant relationship between human capital and financial performance. A link between other components of intellectual capital and financial performance has not been found.
13	2011	Ahangar	observations for a well-known company in Iran for the period 1980-2009 (secondary data)	examining the impact of intellectual capital components (human, structural and physical capital) on company performance (profitability, sales growth and labor productivity)	Intellectual capital has a positive effect on profitability and labor productivity. No impact on sales growth was found. Human capital has the strongest influence on the performance of the observed company.
14	2011	Phusavat, Comepa, Sitko-Lutek and Ooi	sample of 24 manufacturing companies listed on the capital market in Thailand (Stock exchange of Thailand) (secondary data from annual reports)	examining the impact of intellectual capital and its components (human, structural and innovation capital) on financial performance	Intellectual capital has a significant positive effect on all examined indicators of financial performance of the company (ROE, ROA, revenue growth and labor productivity).
15	2011	Clarke, Seng and Whiting	sample of 1,676 companies in Australia listed on the capital market (Australian Stock Exchange) for the period 2004-2008 (secondary data)	examining the impact of intellectual capital and its elements (human, structural and relational capital) on financial performance (ROA, ROE, revenue growth and labor productivity)	Intellectual capital directly affects the financial performance of the observed companies.
16	2012	Mondal and Ghosh	sample of 65 banks in India for the period 1999-2008 (secondary data)	examination of the relationship between intellectual capital and financial performance of the company (ROA, ROE, total assets turnover ratio)	Intellectual capital is an important determinant of banks' profitability and productivity and strongly influences their competitive advantage.
17	2012	Alipour	sample of 39 insurance companies in Iran for the period 2005-2007 (secondary data)	examining the impact of intellectual capital on a company's financial performance (ROA)	Intellectual capital and its components (human, structural and engaged capital) have a significantly positive impact on the financial performance of the company.
18	2012	Mehralian, Rajabzadeh, Sadeh and Rasekh	sample of 19 companies from the pharmaceutical industry listed on the Iranian Stock Exchange, data for the period 2004-2009 (secondary data)	examining the relationship between the components of intellectual capital (human, structural and physical capital) and enterprise performance measured by profitability, productivity and market value	Intellectual capital has a positive effect on profitability, but a significant link with productivity and market value has not been found. Among the observed components of intellectual capital, physical capital has the strongest impact on profitability.

Id.	Year	Autor(s)	Sample	Research objectives	Empirical results
19	2013	Joshi, Cahill, Sidhu and Kansal	sample of 40 companies from the financial sector in Australia listed on ASX, data for the period 2006-2008 (secondary data)	examining the relationship between intellectual capital and financial performance of a company	The ability to create value for the financial sector in Australia is strongly influenced by human capital. However, a high level of human and structural capital does not necessarily lead to high performance (measured by ROA). The strongest determinant of a company's ROA is physical capital.
Secondary data research: Examining the impact of intellectual capital (other IC measures) on a company's financial performance					
20	2003	Riahi-Belkaoui	sample of 81 multinational companies in the United States (secondary data)	examining the relationship between intellectual capital and financial performance measured by the ratio of net value added to total assets (VATA)	Intellectual capital has a significant positive effect on the financial performance of a company.
21	2005	Wang and Chang	sample of enterprises from the information technology (IT) industry in Taiwan for the period 1997-2001 (secondary data from annual reports)	examining the impact of different components of intellectual capital (human, innovation, process and customer capital) on financial performance	All components of intellectual capital (except human capital) directly affect the financial performance of a company. Human capital indirectly affects performance (by influencing other components of intellectual capital).
Primary data research (survey questionnaires): Examining the impact of intellectual capital on a company performance					
22	1998	Bontis	sample of 64 respondents (MBA students) in Canada (survey questionnaire)	examining the impact of intellectual capital elements (human, structural and relational capital) on the financial and organizational performance of a company	There is a valid, reliable, significant and material connection between the dimensions of intellectual capital and performance.
23	2000	Bontis, Chong Keow and Richardson	sample of 107 respondents in Malaysia, in two industrial sectors (survey questionnaire)	examining the interdependence of the three elements of intellectual capital (human, structural and customer capital), examining the relationship between structural capital and business performance (measured by profit, sales growth, profit growth, market share and other indicators)	Structural capital as a component of intellectual capital has a significantly positive impact on business performance, independent of industry.
24	2003	Engström, P. Westnes and S. F. Westnes	sample of 13 hotels from the Radison SAS hotel chain (survey questionnaire)	examining the impact of intellectual capital and its individual components (human, customer and structural capital) on financial and organizational (sick leave frequency and work climate) performance	A weak link was found between intellectual capital and financial performance, but a strong positive link was found between structural capital and company financial performance. A positive relationship has been found between individual components of intellectual capital and organizational performance of the company.
25	2005	Bollen, Vergauwen and Schnieders	sample of 41 companies in the pharmaceutical industry in Germany (survey questionnaire)	examining the impact of elements of intellectual capital (human, structural and relational capital) and intellectual property on the financial and other performance of companies in the pharmaceutical industry	The individual components of intellectual capital (human, structural and relational) are interdependent, there is a positive significant relationship between human capital and intellectual property, structural capital and intellectual property, and relational capital and intellectual property. Intellectual property significantly positively affects a company's performance.
26	2007	Huang and Hsueh	sample of 101 engineering consulting firms in Taiwan (survey questionnaire)	examining the impact of components of intellectual capital (human, relational and structural capital) on the financial and operational performance of enterprises	Among the three components of intellectual capital, only relational capital has a direct positive impact on the financial performance of the observed companies. The impact of human capital on performance is indirect (through its interdependence with relational capital).

Id.	Year	Autor(s)	Sample	Research objectives	Empirical results
27	2008	Cabrita and Bontis	sample of 253 respondents from 53 banks in Portugal (survey questionnaire)	examining the interdependence of the three elements of intellectual capital (human, structural and relational capital) and examining their relationship to bank performance	The individual components of intellectual capital (human, structural and relational) are interdependent, there is a positive significant relationship between the components of intellectual capital and the performance of the enterprise.
28	2010	Namvar, Fathian, Akhavan and Gholamin	sample of 106 top and senior managers of companies in the computer and electronics industry in Iran (survey questionnaire)	examining the impact of intellectual property on intellectual capital and enterprise performance	Intellectual property has a significant positive effect on the components of intellectual capital (human, relational and structural capital). Company performance is positively related to all three components of intellectual capital.
29	2010	Kamukama, Ahiauzu and Ntayi	sample of 65 microfinance institutions in Uganda (survey questionnaire)	examining the interdependence of intellectual capital components (human, structural and customer capital) and their impact on financial performance	All components of intellectual capital have a significant positive impact on financial performance. Human capital influences performance through structural and relational capital. No interdependence between relational and structural capital was found.
30	2010	Sharabati, Jawad and Bontis	sample of 132 top and middle managers of companies in the pharmaceutical industry in Jordan (survey questionnaire)	examining the impact of elements of intellectual capital (human, structural and relational capital) on the financial and other performance of companies in the pharmaceutical industry	Companies in the pharmaceutical industry in Jordan effectively manage intellectual capital. It has a significantly positive impact on company performance.
31	2012	Abdullah and Sofian	sample of 144 respondents, internal auditors in companies listed on the Malaysian Capital Market (PLC) (survey questionnaire)	examining the impact of elements of intellectual capital (human, structural, customer capital and spiritual capital) on the business performance of a company	All four components of intellectual capital have a strong impact on the business performance of the company. Performance is most strongly influenced by relational capital.
Primary data research (survey questionnaires): Examining the impact of intellectual capital on the performance of small and medium-sized enterprises (SMEs)					
32	2002	Peña	sample of 114 start-up entrepreneurs in Spain (survey questionnaire)	examining the impact of elements of intellectual capital (human, organizational and relational capital) on the ability to grow and survive start-up entrepreneurs	Human capital (education, experience and level of motivation of entrepreneurs), organizational capital (ability to introduce changes and implement appropriate strategies) and relational capital (building a productive business network and good relations with all stakeholders) positively affect the growth and survival of start-up entrepreneurs.
33	2007	Cohen and Kaimenakis	sample of 52 SMEs in the service sector (advertising, IT and consulting) in Greece (survey questionnaire and secondary data)	examining the impact of certain forms of intellectual property ("hard", "soft" and "functional") on the financial performance of small and medium-sized enterprises (SMEs)	"Hard" intellectual assets have a significant positive effect on financial performance, the relationship between "functional" intellectual assets and financial performance is positive but weaker, while "soft" intellectual assets do not affect the financial performance of the observed companies.
34	2009	F-Jardón and Martos	sample of 113 producers in the wood industry in Argentina (survey questionnaire)	examining the impact of elements of intellectual capital (human, structural and relational capital) on the financial, organizational and innovation performance of small and medium-sized enterprises (SMEs)	Structural capital is the only component of intellectual capital that directly positively affects a company's performance. The influence of other components (human and relational capital) is indirect (through their interdependence with structural capital).
35	2016	Cleary and Quinn	sample of 43 SMEs in Ireland (survey questionnaire)	examining the impact of the application of cloud accounting infrastructure (as a component of structural capital) on the financial performance of small and medium-sized enterprises (SMEs)	The application of cloud accounting infrastructure has a significant positive impact on human and relational capital, and the impact on structural capital is not significant. All three components of intellectual capital have a significant positive impact on financial performance.

Id.	Year	Autor(s)	Sample	Research objectives	Empirical results
Examining the impact of intellectual capital on company performance (other topics)					
36	2005	Subramaniam and Youndt	sample of 93 companies in the USA (survey questionnaire and secondary data)	examining the impact of different components of intellectual capital (human, organizational and social capital) on the innovation capacity of the company	Organizational capital has a significant positive effect on the capacity to develop incremental innovations, and human capital in interaction with social capital on the ability to create radical innovations. Human capital (independently) is negatively related to the capacity to create radical innovations, while social capital has a significantly positive effect on the capacity to create both types of innovation.
37	2006	Chen, Lin and Chang	sample of 159 respondents from manufacturing companies in Taiwan (survey questionnaire)	examining the impact of intellectual capital on financial performance and on performance related to new product development	All three components of intellectual capital (human, structural, and relational) have a significantly positive impact on new product development performance, with the link being stronger as industry achieves higher growth rates. In companies, relational capital is the most represented, followed by human capital and then structural capital. Human capital and structural capital are less represented in small and medium-sized enterprises compared to large enterprises.
38	2007	Bramhandkar, Erickson and Applebee	sample of 139 companies in the pharmaceutical industry listed on North American stock exchanges (secondary data)	examining the relationship between intellectual capital management and organizational performance	Companies with the highest level of intangible assets perform better than those with lower levels and are characterized by a higher return on shares and less variability in the share price.
39	2008	Hsu and Fang	sample of 123 companies from the design industry in Taiwan (survey questionnaire)	examining the relationship between intellectual capital and the learning ability of the organization and the ability to develop new products	Human and relational capital positively affect the ability to develop new enterprise products by indirectly acting on learning abilities. All three components of intellectual capital significantly positively affect the ability of organizational learning.
40	2009	Yang and Lin	sample of 277 HRM managers in hospitals in Taiwan (survey questionnaire)	examining the mediation of intellectual capital in the relationship between human resource management (HRM) practices and organizational performance (measured by patient satisfaction, employee satisfaction, management efficiency, etc.)	Intellectual capital plays an indirect role in the relationship between human resource management practices and company performance.
41	2011	Kamukama Ahiauzu and Ntayi	sample of 65 microfinance institutions in Uganda (survey questionnaire)	examining the indirect impact of competitive advantage in the relationship between intellectual capital and financial performance	Competitive advantage is a significant mediator in the relationship between intellectual capital and financial performance. It strengthens this relationship in 22.4% of surveyed companies (institutions).

EVALUATION OF THE NATIONAL INNOVATION INFRASTRUCTURE DEVELOPMENT OF THE REPUBLIC OF BELARUS AND WAYS TO IMPROVE IT

Venelin Terziev
Georgi Rakovski Military Academy, Sofia, Bulgaria
University of Rousse, Rousse, Bulgaria
Kaneff University Hospital, Rousse, Bulgaria
vkterziev@gmail.com

Vladimir Klimuk
Baranavichy State University, Baranavichy, Republic of Belarus
klimuk-vv@yandex.ru

ABSTRACT
Analysis of the activities of innovation infrastructure entities on the basis of created performance matrices for 2016-2019 showed the existence of considerable growth potential for STP and TTC, that requires dynamic and comprehensive development in the productivity of employees of these entities, implementation of an export-oriented strategy, which is supported by the survey results (on the insufficient level of innovation infrastructure development as one of the problematic aspects of successful cooperation between organizations of the cooperative resource model).
Keywords: *National innovation infrastructure, Development, Communication technologies, Republic of Belarus*

1. INTRODUCTION

In order to stimulate innovation and increase the performance countries implement state innovation infrastructure development policy (the entities of the innovation infrastructure include 'technoparks', technology transfer centres, venture capital organizations). In the Republic of Belarus the innovation infrastructure is represented by 25 entities, including 17 science and technology parks (hereinafter referred to as STP), 7 technology transfer centres (hereinafter referred to as TTC), Belarusian innovation fund (as of 28/12/2020) (2020). Entities of the innovation infrastructure function as separate local integrated resource models within the existing national model. We believe that the working STP and TTC should be the result of gaining experience, expanding the activities (types of activities, territory, client base, partners network) on the basis of gradual transition to a new level. It is not possible to instantly develop such entity of the innovation infrastructure, which would guarantee success.

2. STATE OF THE INNOVATION INFRASTRUCTURE DEVELOPMENT

The basic activities of the STP, according to art. 26 of the Law of the Republic of Belarus "On State Innovation Policy and Innovation Activities in the Republic of Belarus", are focused on providing support to the residents of 'technoparks' through:

- supporting the development of industries that produce new or improved products, the development of new or improved technologies for their implementation on the market;
- supporting their foreign economic activity to promote innovation to the global market;
- providing agreement-based lease of movable and immovable property, including premises for various purposes, in compliance with the law;
- providing assistance in preparation of business plans for innovation projects;
- organizing and conducting market research;

- providing assistance in attracting investments, searching investors and (or) business partners;
- promoting innovation and (or) products, technologies, services, organizational and technical solutions developed with the help of innovation through engaging entities of the innovation infrastructure in exhibitions, fairs, conferences and other events, creating advertising and information products (2016).

The basic activity of the TTC, according to art. 27 of the Law of the Republic of Belarus "On State Innovation Policy and Innovation Activities in the Republic of Belarus", is transfer of technology, which includes:

- conducting market research to discover possibilities of introducing innovations as well as products, technologies, services, organizational and technical solutions developed on the basis of these innovations;
- providing services (performing tasks) to ensure legal protection of the innovation;
- providing engineering, consultancy and project design services (engineering services);
- providing assistance in preparation of business plans for innovation projects;
- providing assistance in attracting investments, searching investors and (or) business partners;
- providing services in managing innovation projects;
- promoting innovation and (or) products, technologies, services, organizational and technical solutions developed with the help of innovation through engaging entities of the innovation infrastructure in exhibitions, fairs, conferences and other events, creating advertising and information products (2016).

Based on the established criteria in the generated interim and annual statements of the activities of the entities of innovation infrastructure we will analyse their performance (2020). Our team will analyse the activities of the innovation infrastructure entities for 2016-2019 (Table 1) (2020).

Table 1: Analysis of the activities of the innovation infrastructure entities for 2016-2019

Entity of the innovation infrastructure (year of establishment)	Services	Total area, m^2	Number of residents	Number of workplaces	Total volume of works (services) performed by STP, million rubles	Total volume of gross investments by residents, million rubles	Total volume of exports by residents, million rubles
1. Science and technology parks							
Brest region							
"Brest Science and Technology Park" JSC (2017)	Leasing premises, movable property and equipment. Technology transfer services (search for partners, consultancy services, organization of round tables, assistance in projects development for participation in competitions and programmes). Organization and holding events. Intermediary services. Development and assistance in managing innovation and investment projects. Printing services, 3D printing, 3D scanning. Computer programming.	16 942,0	69	581	1,846	22,457	0,845
"Polese" Technology park Ltd. (2010)	Conducting market research, developing logos, trademarks and product packaging. Developing websites and applications. Technological consultancy in the field of biotechnology, agricultural biotechnology, reengineering,	236,4	5	19	-	-	-

	environmental management in an enterprise. Assistance in preparation of project applications for participation in competitions and programmes. Providing services for the selection of technologies that contribute to the innovation development of the products. Holding seminars, business trainings and start-up events.						
"Ferment" Technology park Ltd. (2019)	Consultancy services to residents on legislative issues. Protection and evaluation of intellectual property of the technopark residents. Turnkey development of business plans for innovation projects of the technopark residents. Science and technological evaluation of business plans for innovation projects. Search of investors and business partners for implementation of the innovation and start-up projects by the technopark residents. Selection of investment sites in the region for the technopark residents. Marketing and trading site. Digitalization of biotechnological industries.	1810,0	5	98	3,1	0,1	1,2 Approx. 1,1 million
Vitebsk region							
"Science and technology park of the Vitebsk State Technological University" (2010)	Engineering and reengineering services to residents and enterprises of the region, development of project and technological documentation. Development of precise highly detailed three-dimensional models of real objects. Making prototypes with 3D printers. Scanning items with 3D scanner and making solid models, measuring the scanned elements. Restoring the design documentation of worn-out and out-of-order products. Manufacturing unique equipment. Manufacturing of small series of parts by vacuum casting. Developing equipment designs. Research and development activities. Recycling of waste of light industry enterprises. Agreement-based leasing of office and technological equipment to the residents.	3763	10	116	0,487	1,423	18,22 Approx. 2,2 million
"Law and Order" Technological park (2017)	Subletting office and industrial premises. Providing office furniture for free use. Holding seminars, forums, trainings and other events to develop innovative entrepreneurship and creative environment for innovations. Start-up school in Vitebsk. Providing services for the development of business plans, organization and holding of marketing research. Advertising in the office, on the website and social media groups.	4610,2	6	174			
"Science and technology park of the State Polotsk University" (2010)	Agreement-based leasing of movable and immovable property. Software development, assistance in registering copyright transfer agreements (software product of Beta+5 stage for calculating construction structures). Assistance in developing industries with new technologies and development of high tech industries. Assistance in promoting the products, manufactured with the use of latest high technologies. Manufacturing and repair of advanced equipment. International activity.	346,5	5	28	0,473	0,301302	0,26

	Development of design and technological documentation according to latest requirements. Software products development in the sector of technologies and services. Development and manufacture of systems for controlling the rotation frequency of drive components and measuring torque of various cutting methods of materials. Development of business plans, financial business strategy and complex financial analysis. Repair and manufacturing of details and units of technological equipment. Ion-plasma thin film coatings of products, including medical items, to increase durability, wear and tear and corrosion resistance.						
Gomel region							
"Gomel Technopark" JSC (2010)	Leasing of real property. Leasing of various office furniture and computer equipment. Information and consulting services: - providing information about types and conditions for receiving state financing for the development of small and medium-sized enterprises; assistance in the preparation of required documents; - providing assistance in recruiting personnel; - providing support in searching for business partners and investors; Telecommunication services: - installation and configuration of telecommunication equipment for the office workers (commutator, router); - setting up the Internet, Wi-fi, local area network with a possibility to divide into VLAN; - connection and configuration of peripheral devices; - consultations on purchasing server and commutation equipment to optimize costs.	4927,6	6	216	1,24	Profit 6,62	26,67
"Agency for Development and investment promotion" (technopark "Coral") (2013)	Development of business plans. Marketing services. Lease of premises for different purposes. Lease of real property.	18986,9	3	7	0,69	-	-
Grodno region							
Republican Unitary Enterprise "Educational research and production centre Technolab" (2017)	3D modelling, reverse engineering and manufacturing of personalized products (3D printing and laser cutting). Agreement-based manufacturing of mechanical parts with the help of modern CNC machine tools (milling, engraving, drilling, lathes). Development and manufacturing of automated laboratories to ensure the integrated use of information technologies and real experiment during laboratory works in physics, chemistry, biology and ecology. Agreement-based manufacturing of single copies of radio electronic devices in small series, including printed circuit boards, installation works. Agreement-based lease of movable and immovable property in compliance with the law, including premises for various purposes; Mass media promotion of the activities of the technopark and its residents; Provision of other services (works) related to scientific, technological and research activities.	7076,6	10	34	0,605	Profit 0,253	0,107
City of Minsk and Minks region							

Republican Innovative Unitary Enterprise "Science and technology park of the Belarusian National Technical University "Politechnik" (1992)	Implementation of innovation projects based on technologies developed by the BNTU with further establishment of spin-off companies of the technopark residents. Development of business plans and fund raising for implementation of innovation projects and university start-ups. Provision of modern infrastructure and advanced technologies for the university start-ups and the residents of the BNTU technopark. Provision of a full range of information and marketing services for the development and "growing" of innovation business in the BNTU. Protection and management of intellectual property created within research and innovation projects. Engineering services: Development and design of high-tech products, 3D modelling, prototyping, creation of turnkey technological sites. Consultation on the implementation of research and innovation. Search of investors/partners and promotion of products. Manufacturing services for the processing of materials/half-finished products.	3327,68	20	170	18	9,7	6,8 Profit 1,2 million
"Minsk city technopark" Ltd. (2011)	Lease of sites for various purposes to the technopark. Lease of real property. Storage of property. Product manufacturing. Organization and holding events (business forums, conferences, exhibitions, competitions, trainings, etc.). Educational activities (school of engineering, start-up school). 3D printing, 3D scanning, 3D modelling. Printing services.	44317,6	40	1006	5,3		53,6
"Educational Scientific and Production Republican Unitary Enterprise "Unitehprom BSU" (1999)	Development and production of PC-based measurement systems and measuring equipment. Warranty maintenance and repair of measuring equipment and automotive electronics. Warranty and post-warranty technical support of spirometers MAS. Warranty maintenance and repair of aircraft flight data rewriting equipment. Manufacturing of separate batches of chemical products made of client`s raw materials, packing solid, dry and liquid agents in small containers. Installation, assembly and configuration of electronic devices. Services for manual soldering of electronic components, BGA soldering microcircuits. Distilled water production up to 300 litres per day. Manual soldering of electronic components, soldering of BGA chips. Production of distilled water up to 300 litres per day. Development and organization of the production of food ingredients according to the client`s order (technological additives, enriched minerals, vitamin and mineral complexes, etc.) Packing dry food ingredients from 50 to 500 g.	2298,2	3	18	3,177	0,006414	0,596 Profit 0,277 million
Communal production and trade unitary enterprise Minsk regional technopark	Assistance in innovation development and implementation. Leasing of premises, equipment and transport. International economic activities.	19393,2	4	220	5,3	1,9515	21,9 Profit 49,59 million

(2011)							
"EnCata" Ltd. (2013)	Assistance in the development of innovation implementation process: from idea itself to the production and sales. Engineering services (industrial design, construction and tool engineering, development of electronics and embedded software, industrial prototypes, etc.) Mathematic modelling and software development (Al, blockchain, mobile, enterprise). Marketing (market research, development of a promotion strategy, etc.) Consulting services (legal and accounting services, protection of intellectual property, development of business plans, attraction of state and private investments, assistance in licensing and franchising, improvement of business processes, implementation of a "lean manufacturing" system, etc.)	8901	2	43	7,3		0,97 Profit
"Borisov Regional Technopark" Ltd. (2020)	Organization of educational seminars. Organization of foreign business missions. Search of investors for companies. Search of projects for investors. Trainings for venture investors. Intensive start-up training programmes for further participation in start-up accelerator programmes. Assistance in registering companies. Consultations on organization and management of business, existing benefits and grants projects. Assistance in creating prototypes. Organization of start-ups competitions. Lease of manufacturing, office and laboratory facilities. Expert guidance in marketing. Assistance in developing a business plan. Assistance in recruiting qualified professionals. Assistance in clinical trials. Assistance in developing export (establishing sales abroad). Assistance in getting industrial waste disposal permits. Assistance in finding a business mentor. Lease of specialised equipment. Consultations on the protection of intellectual property. Assistance in website creation and hosting. Assistance in negotiating with Italian partners with the prospect of cooperation. Transfer of technologies from scientific institutions into production. Assistance in finding and attracting interns.	3660,8	-	-	-	-	-
Mogilev region							
"Technology park Mogilev" JSC (1993)	Development and management of innovation and investments projects. Energy saving services. Educational events. Lease of premises for offices and laboratories. Lease of modern conference rooms: conference hall, classroom and negotiation room.	3439	14	194			
"Gorki" Technopark (2017)	Development of business plans and investments projects. Consulting and engineering services in the production and innovation sector. Holding educational event. Lease of movable property of research and development centre	1833,8	3	13	0,06		0,13 Approx. 1,07 million

	(R&D centres) for collective use of equipment: - "Biological Technologies in Agriculture" R&D centre; - "Modelling and prototyping with the help of 3D equipment" R&D centre; - "Precision agriculture and GIS technologies" R&D centre;						
2. Technology Transfer Centres							
Entity of the innovation infrastructure (year of establishment)	Services		Number of employees	Number of technological offers	Number of technological requests		
Brest region							
Separate Unit "Technology transfer centre" at the Baranovichi State University (2020)	Research and technological developments. Research. Organization of events for entities of the innovation infrastructure, such as exhibitions, fairs conferences, etc. Development of business plans for innovation projects. Consultancy services. Educational services. Software development. Business plans development.		7	9	4 Approx. 3,7 thousand		
Vitebsk region							
Separate Unit "Medical and Pharmaceutical Technology Transfer Centre" at Vitebsk State Order of People`s Friendship Medical University (2016)	Search for assignors of scientific research. Preparation of project and cost documentation related to various types of research. Assistance in organization of research activities at the Vitebsk State Medical University or, if necessary, search for subcontractors. Audit during the implementation of research and of its final results. Assistance in the preparation and submission of reports to the assignor of the research.		8	6	Profit 24,1 thousand rubles./4		
Gomel region							
Republican Unitary Enterprise "Centre of scientific, technological and business information" (2010)	Assistance to local businesses to attract and implement investment projects. Holding educational and practical seminars (webinars) to promote innovation.		9	127	91		
Grodno region							
Separate Unit "Technology Transfer Centre" at the Yanka Kupala State University of Grodno (2017)	Monitoring the results of intellectual activity that is beneficial to regional businesses, assisting in implementation of intellectual activity results. Consulting on intellectual property management, transfer (commercialization) of technologies. Presenting the developments on competitions, exhibitions and other events and negotiating with potential assignors. Audit during the implementation of research and of its final results. Negotiating with potential buyers and investors interested in developing and implementing the results of research and educational activity. Developing a strategy and taking needed actions for the commercialization of the results of intellectual activity. Participating in the development and implementation of international technical assistance projects. Preparing business plans for innovation projects. Providing assistance in signing cooperation agreements with enterprises of the real sector of the economy and entities of the innovation infrastructure, collaboration with the chamber of commerce. Providing organizational support, conclusion and contract support for the implementation of scientific and technological projects with the purpose of commercialization of the results of intellectual activity and export of research products. Providing technical and organizational support of the regional research programme "Innovation development of the Grodno region". Organizing and holding competitions, seminars, trainings, educational events about "Innovative entrepreneurship".		8	24	4		
"Apsel" Ltd. (1998)	Assistance in attracting national and foreign investors to create competitive products.		7	7	8 Profit 0,7 thousand rubles		

	Conducting multidisciplinary research of enterprises and their activities. Introduction of intellectual property products on the market. Assistance to entrepreneurs in educating and further training of specialists in the field of innovation management, marketing of knowledge-intensive products by organizing and holding training courses and seminars. Legal and economic consulting of entrepreneurs, development of business plans, articles of incorporation, etc. Assistance in signing international agreements and promoting the products on the global market. Selection of foreign partners to create joint enterprises. Analysis and selection of innovation projects, search for funding sources.			
City of Minsk and Minsk region				
Resource centre "Volma Eco Technopark" at the Republican Institute of Vocational Education (2017)	Providing engineering, consultancy and design services (developing competencies in the field of energy efficiency, energy conservation and renewable sources of energy through the development of knowledge and technology transfer, implemented through various educational activities). Developing business plans for innovation projects (training for the implementation of 9 experimental and innovation projects in the Education institutions). Internships for specialists and managers. Professional development and training courses. Online seminars, conferences, business meetings, educational camps. The activities of the centre aimed at introducing technologies on the market (technologies for "Cleaning the corrosion and lime scale from boilers, heating systems and water circulation systems" using microorganisms as inhibitors released in the primary circulation system; approval of the technology for fuel biomass production through the establishment of an experimental nursery for fast-growing willow trees; development of educational modules for preparing experts in the field of energy saving, efficiency and ecology and technologies for their implementation, etc.) .	31	-	1 Approx. 5.6 thousand + 7,1 thousand
"Stroyiziskania" JSC (2018)	Providing services to the entities of the innovation and investors in the Republic of Belarus, as well as foreign companies and investors.	12	13	12 Approx. 57 thousand
Belarusian Innovation Fund				
Financing innovation and venture capital projects, development of the production on a repayable basis. Organization and holding of scientific practical events: competitions, exhibitions, seminars, conferences, stock exchanges and others. Carrying out research in the main fields of activities of the foundation.				

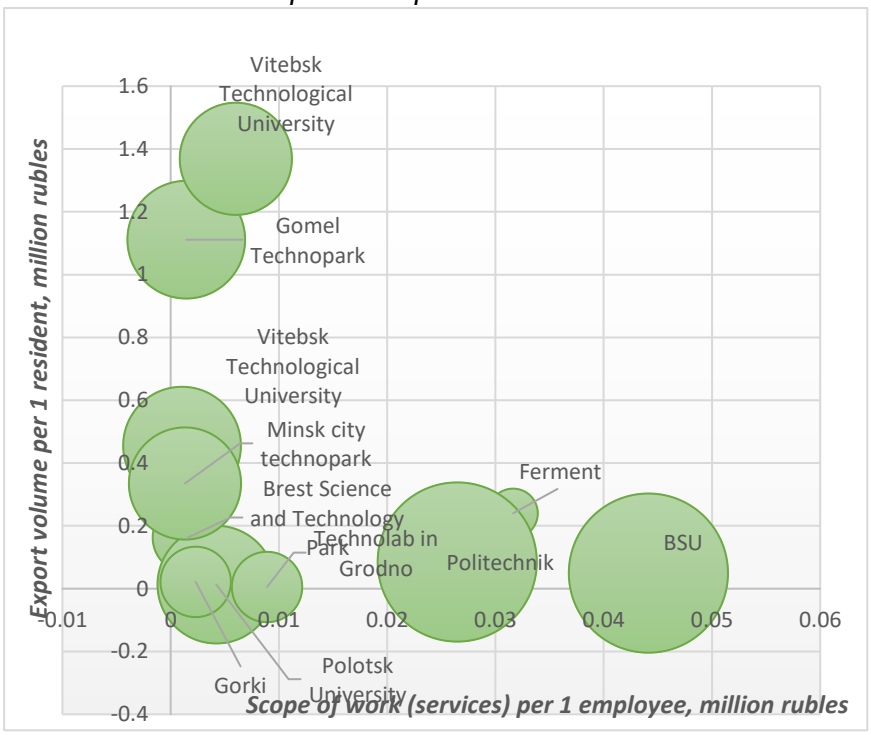
In order to evaluate the performance of the innovation infrastructure entities we will create a matrix chart:

- Performance matrix of the STP activities
  - The following parameters are taken into account as indicators for STP ranking:
  - volume of the produced products (provided services) calculated per 1 resident;
  - total export volume by the STP residents calculated per 1 resident.
- Performance matrix of the TTC activities
  - The following parameters are taken into account as indicators for TTC ranking:
  - total number of investment proposals and investment requests calculated per 1 resident of the TTC;
  - total profit of the TTC calculated per 1 resident.

The indicators in the matrices are calculated for the period of 1 year (Fig. 1-2). The results of the matrix modelling show low performance of the activities of the country`s STP for the analysed period. The majority of the STPs are below the average level in terms of the registered innovation infrastructure entities, the volume of the produced products (provided services) calculated per 1 employee (15,090 rubles/year) and below the average level in terms of the export volume calculated per 1 resident of the STP (349,810 rubles/year). High performance indicators are noted at National Technical University "Politechnik", "Ferment" Ltd., "Unitehprom BSU", which by increasing the share of export per 1 resident have a chance to

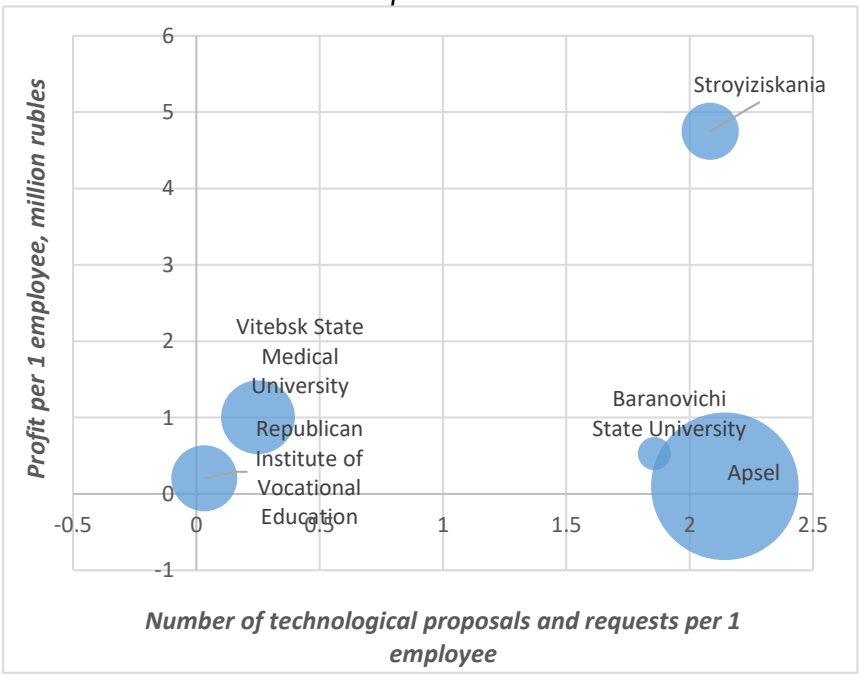
move to the next most attractive quadrant. High performance indicators in terms of export-oriented development strategy are noted at Minsk regional technopark, Gomel technopark, Vitebsk State Technological University, Minsk city technopark, which by increasing the labour intensity indicators strive to move to the strongest quadrant.

Figure 1: Performance matrix of the science and technology parks activities in the Republic of Belarus for 2016-2019



Note: the area of the circle defines the active period of the STP

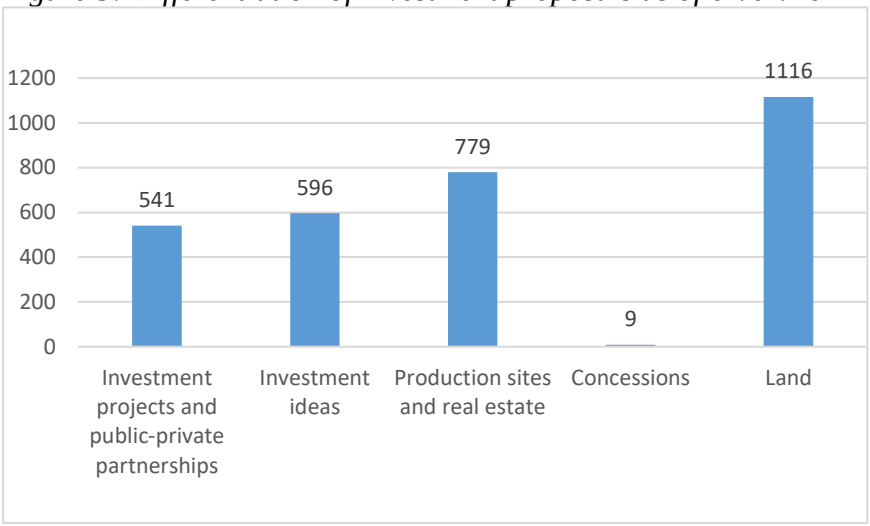
Figure 2: Performance matrix of the technology transfer centres activities in the Republic of Belarus for 2016-2019



Note: the area of the circle defines the active period of the TTC

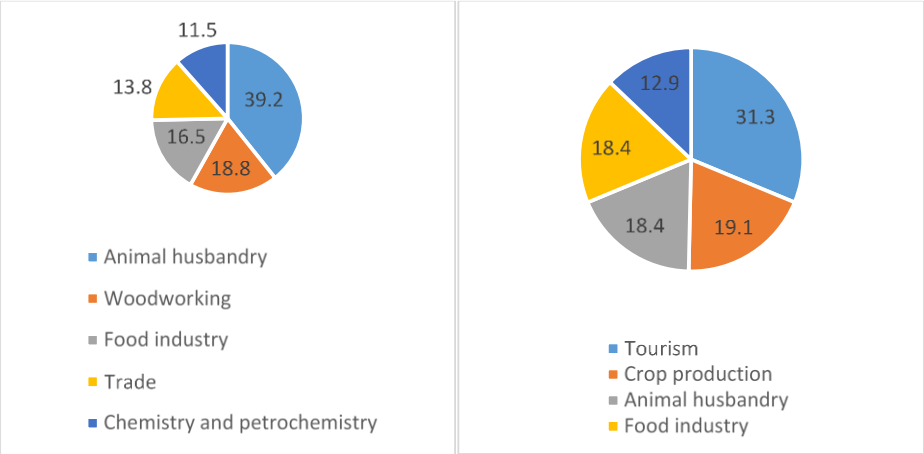
On the basis of the created matrix, it can be noted that "Stroyiziskania" TTC has shown much better results compared to the other TTC in terms of the selected performance indicators: efficiency (total number of technological proposals and technological requests) and profit. Republican Institute of Vocational Education and Vitebsk State Medical University have rather low performance indicators, whereas Baranovichi State University TTC has really good potential. For one incomplete year (2020) it has reached the indicators close to the average registered for the country`s TTCs (by increasing the number of technological proposals and technological requests by only 2 units will allow the TTC move to the next promising quadrant).

Figure 3: Differentiation of investment proposals as of 01/01/2021



In order to stimulate investments for innovation development of regions, the National Agency of Investments and Privatization of the Republic of Belarus is implementing a project "Investor`s roadmap" by creating a database of investment proposals in the regions (Fig. 3) (2021a). Let us mention a large number of investment proposals in terms of the existing production sites and land, which exceeds the number of products of intellectual labour (innovation projects, innovation ideas that establish the innovation process). Investment projects by sectors (technologically well-developed, economically justified and approved) prevail in the animal husbandry sector (39,2%) and investment ideas by sectors (without approval) – in the tourist sector (31,3%), which is due to the consumers market demand (Fig. 4) (2021a).

Figure 4: Investment projects and investment ideas by sectors as of 01/01/2021



3. LEGAL REGULATIONS AND INCENTIVES FOR INNOVATION DEVELOPMENT OF ORGANIZATIONS

In order to stimulate and improve innovation performance in the country, the government improves the legislative framework, which provides business incubators to support small innovative enterprises. In particular, the Decree of the President of the Republic of Belarus No. 105 dated 12/03/2018 "On amending the decrees of the President of the Republic of Belarus" contains the following measures to stimulate the activities of technoparks and their residents:

- Designing a mechanism for reinvestment of up to 50% of tax deductions from technoparks and their residents for the development of these technoparks and their residents. The implementation of such a mechanism means that the technoparks and their residents will be able to invest their deductions to extrabudgetary funds for innovation development, created by these technoparks. The costs of these funds are for the purposes defined in art. 26 of the Law of the Republic of Belarus No. 425-3 dated 10 July 2012 "On State Innovation Policy and Innovation Activities in the Republic of Belarus", as well as for the activities and development of material and technological base of the technological parks; financing of the innovation projects implemented by their residents;
- Providing technoparks with flexible rental policy. Technological parks are given the opportunity for flexible rental policy in relation to their residents by applying an additional coefficient from 0,1 to 1. The difference between the rental payment of the technopark and the flexible rent of the resident goes to the innovation development fund;
- Exemption of technoparks and their residents from value-added tax and customs duties when importing technological equipment in the Republic of Belarus for innovation projects implementation within the State Innovation Development Programme of the Republic of Belarus.

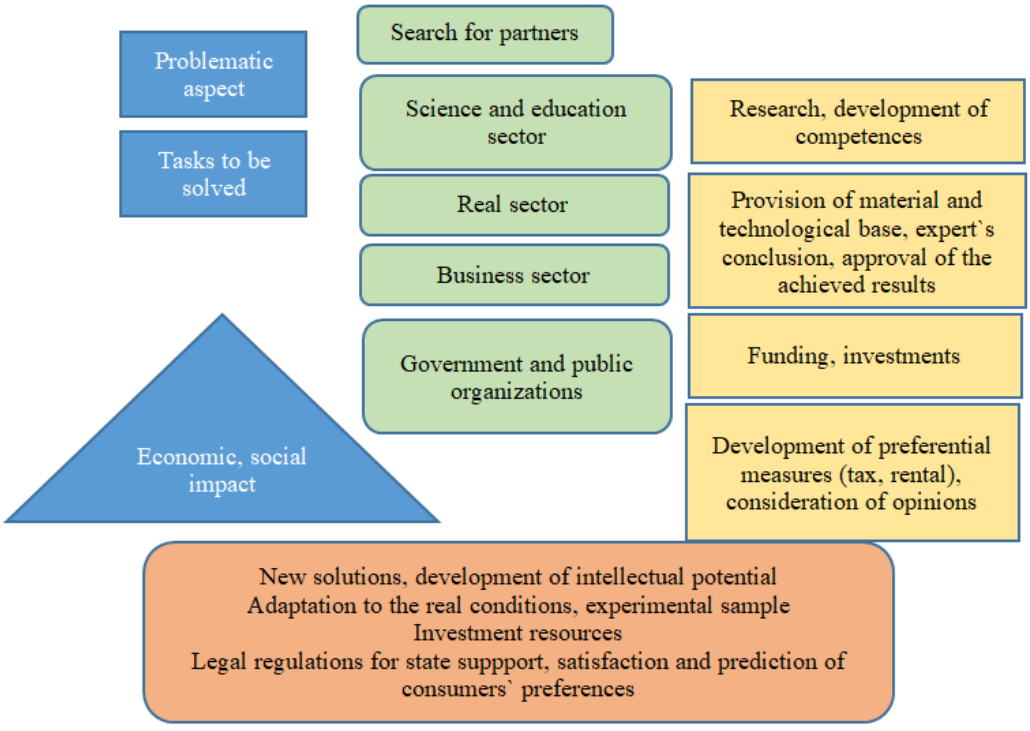
The following actions aimed at financing the activities of innovation infrastructure entities in the Republic of Belarus are performed:

- Financing the development of material and technological base with the costs of the Republican centralized innovation fund;
- Financing the development of material and technological base with the costs of regional innovation funds (purpose: "To finance the organization of activities and the development of material and technological base, including capital expenditures, the entities of the innovation infrastructure");
- Acquiring fixed assets (scientific, technological and other equipment, tools and other devices) at the expense of the republican budget, required for research, technological and innovation activities, organization of the activity and development of material and technological base of the innovation infrastructure entities;
- Participating in the implementation of innovation, research and development projects (state research programmes, state innovation development programmes, specific projects).

As a problematic aspect in terms of financing and further reporting of the results of financing R&D and innovation activity with allocated budget funds the following should be emphasized: the allocated funds are used strictly in accordance with the approved cost estimate. The estimate is approved for the coming year, which considerably complicates the process of planning the exact prices for the goods (services) to be purchased, the stability of the activities of potential suppliers (partners) for the planned period and the availability of the requested goods (services). To stabilize this problematic aspect we need to consider the possibility of adding some alternative positions to the estimate in terms of goods (services) (in case the requested goods (services) are not available, to purchase equivalents), prioritizing the qualitative performance of the objectives (achieving final result); the possibility of providing conditions for adjusting

the required quantity by product groups (services) (in terms of the goal of the activity and the limits of the total budget resources); the possibility for adjusting the products (services) to the amount of the specified share of the total budget resources on a decision of the innovation infrastructure entity; the possibility of simplifying the reporting procedures and procedures for coordinating the financing of each product (work, service). This way, the entities of the innovation infrastructure stimulate the innovation in the field of industry, information technologies, agriculture, ecology, medicine, education and others. However, such stimulation both in technoparks and technology transfer centres is based on preferential measures that ensure favourable conditions for launching innovative products (usually an independent launch). Individual organizations (residents, partners) have an opportunity to develop their innovation activity on favourable terms. We believe that creating innovation alliances based on the cooperative resource model of mutually beneficial partnerships between the science and education sector, the business sector, the real sector of the economy, the government and public organizations would help stimulate innovation activity of organizations, in particular, industrial business. The alliances in these cases can be both temporary (for the implementation of a certain innovation project) and permanent. The starting point of creating an innovation alliance is the existing problematic aspect, usually in industrial business. In order to solve the problem the representatives of the above mentioned sectors should be engaged to study the matter, to approve the achieved results, to provide various financial instruments for innovation implementation, to receive the support of public authorities and to analyse the public opinion. Each participant (partner) performs their function and the initiator of such an alliance, the one who expressed the need to solve a specific task (problematic aspect), controls the general coordination of the activities. After achieving the goal the alliance may be disbanded or transformed into a permanently functioning unit while maintaining the legal integrity of each partner, taking into account the industry specifics and gradually defining its specialization (based on the tasks to be solved). (Fig. 5).

Figure 5: Organizational scheme of functioning of an innovation alliance as a form of



cooperative resource model partnership

The innovation alliance activity enables the increase of social and economic performance in the region (country). The following criteria are defined as assessment indicators:

- volume of manufactured products in value terms (increase in production volumes);
- number of vacancies, additional work places created (reduction of unemployment);
- comparison of average wages (coefficient for wages comparison in the alliance and the average in the region/industry);
- return of invested resources (coefficient of return on investment per 1 ruble of costs) and others.

4. CONCLUSION

The article allows us to draw some summary conclusions:

- The results of a large-scale survey of respondents reveal the factors of innovation development of industrial business organizations that influence the innovation performance the most. In particular, such factors include the development of material and technological infrastructure (64,2% of the respondents gave the maximum score), the development of intellectual potential (increasing competence of the labour force, additional trainings and other forms of intellectual potential development) (60,4%). The quantitative manifestations of these factors in the form of scores and their statistical analysis enabled the development of a predictive model for innovation development scenarios of industrial business organizations working within the cooperative resource model (based on linear and quadratic functions). The results of the survey also helped establish the main motivators that stimulate organizations of the cooperative resource model to search for means and ways for a successful collaboration. Some of the most important motivators include the possibility of receiving new knowledge, the access to modern equipment and the possibility of approval of the achieved results in real conditions. Moreover, the results of the survey helped identify problematic aspects that prevented the successful collaboration between the organizations. Some of the strongest ones include the limited ability of financing (investing) innovation ideas, ineffective communication between the partner organizations and insufficient development of the national innovation infrastructure;
- Analysis of the activities of innovation infrastructure entities on the basis of created performance matrices for 2016-2019 showed the existence of considerable growth potential for STP and TTC, that requires dynamic and comprehensive development in the productivity of employees of these entities, implementation of an export-oriented strategy, which is supported by the survey results (on the insufficient level of innovation infrastructure development as one of the problematic aspects of successful cooperation between organizations of the cooperative resource model);
- Analysis of the approval of the cost estimates of budgetary funds on research and development showed that there is a need to provide a possibility of adding some alternative positions to the estimate in terms of goods (services) (in case the requested goods (services) are not available, to purchase equivalents), prioritizing the qualitative performance of the objectives (achieving final result); the possibility of providing conditions for adjusting the required quantity by product groups (services) (in terms of the goal of the activity and the limits of the total budget resources); the possibility for adjusting the products (services) to the amount of the specified share of the total budget resources on a decision of the innovation infrastructure entity; the possibility of simplifying the reporting procedures and procedures for coordinating the financing of each product (work, service).

LITERATURE:

1. *Entities of the innovation infrastructure of the Republic of Belarus*. 2020 / edited by A.G. Shumilina. – Minsk: State University "BelISA", 2020. – p. 98, (2020).
2. *Law of the Republic of BelarusNo. 425-3 dated 10 July 2012 "On State Innovation Policy and Innovation Activities in the Republic of Belarus"* (as amended and supplemented on 11 May 2016), (2016).
3. *National Agency of Investments and Privatization of the Republic of Belarus*. https://map.investinbelarus.by/regions, (2021a), 02/2021.
4. Terziev, V., Klimuk, V. (2021b). *Methodological concepts for modernization of industrial enterprises in the concept of postindustrial development*. // 65th International Scientific Conference on Economic and Social Development – Online Conference, 19 February, 2021, Economic and Social Development (Book of Proceedings), Cakovec, Croatia, 2021, pp.1-5, ISSN 1849-7535.
5. Terziev, V., Klimuk, V. (2021c). *Strategic of models of post-industrial development of industrial enterprises in terms of the concept of national security*. // 65th International Scientific Conference on Economic and Social Development – Online Conference, 19 February, 2021, Economic and Social Development (Book of Proceedings), Cakovec, Croatia, 2021, pp.180-186, ISSN 1849-7535.
6. Terziev, V., Klimuk, V. (2021d). *Modelling the forms of international scientific and educational cooperation*. // 20th RSEP International Economics, Finance & Business Conference – Virtual/Online 17-18 February 2021, Holiday Inn Vienna City, Vienna, Austria, Review of Socio-Economic Perspectives RSEP, Ankara, Turkey, 2021, pp. 151-156, ISBN: 978-605-06961-8-9.
7. Terziev, V., Klimuk, V. (2021e). *Directions for modernization of innovative youth startup design in Belarus*. // 20th RSEP International Economics, Finance & Business Conference – Virtual/Online 17-18 February 2021, Holiday Inn Vienna City, Vienna, Austria, Review of Socio-Economic Perspectives RSEP, Ankara, Turkey, 2021, pp. 157-162, ISBN: 978-605-06961-8-9.

OVERVIEW OF EUROPEAN PACKAGING INDUSTRY WITH SPECIAL EMPHASIS ON COVID-19 PANDEMIC

Dorijan Naletina
Rotoplast Ltd., Croatia
dorijan13naletina@gmail.com

ABSTRACT

The packaging industry in Europe has been facing the challenges of establishing eco-friendlier, safer, and adequately labelled packaging. These challenges are extremely difficult to tackle due to the growing costs of production on the one hand, and, on the other hand, the pandemic caused by the coronavirus which has significantly affected this sector of industry. Investing in new technologies and human resources are key factors for establishing a long-term stability on this market. The speed with which one adapts to new trends and the use of digitalization and automatization in the business with the aim of satisfying the growing demands in quality is the road towards achieving a long-term competitiveness for a company on the packaging market. It is the packaging of a certain product that lures the buyer into purchasing and ensures the product's recognizability. The aim of this paper is to analyse the current European packaging market with special regard to the challenges the companies are facing in this pandemic times.
Keywords: *packaging industry, Europe, COVID-19 pandemic*

1. INTRODUCTION

The packaging industry in Europe bears an important role in developing other sectors and therefore occupies the central position regarding the competitiveness of the European economy (EUR-Lex, 14.07.2015). To be able to hold on to that position, this industry sector should base its development on the efficient resource management, research and development, and innovation, social dialogue, the speed of adjustment and sustainability (European Economic and Social Committee, 10.12.2014). The thriving position of this industry reflects in the fact that this very sector is one of the greatest employers on the American market, putting to work many experts in their respective fields such as sales, communications, marketing, production, printing, graphic design, mechanical and electrical engineering, physical and organic chemistry and food technology (vault, N/A). Also, it should be recognized that attractive packaging ensures product recognizability (Pavlović, 05.07.2017). There are several key players that drive the packaging industry: the society, the manufacturers and the consumers. The consumers strive to get the hold of higher quality products that are more likely to meet their ever-changing lifestyle (Yam, 2010). Likewise, the consumers have been lately giving more attention to the packaging design and so, the speed of developing different designs determines the successfulness of the company on the market (print-magazin.eu, 07.07.2021). If a company wishes to set its product apart from the other similar products on the market, it should invest in the design and functionality and the packaging innovation (Pavlović, 05.07.2017), bearing in mind the recyclability of the packaging. The COVID-19 pandemic has considerably impacted the market. The proof can be found in the transformation of the most recognizable product of this industry - the humble cardboard box. Most countries have experienced complete lockdowns in the past 18 months, so the packages that have been sent to home addresses, have been cheering people up (Dempsey and Evans, 20.07.2021). This has considerably influenced the packaging industry. Therefore, its analysis, with special insight into the challenges during the pandemic, is placed in the focus of this paper. It has been structured in four chapters. Following the introduction, the second chapter provides the features of the European packaging industry, first, giving the general overview and then, providing short analysis of the industry's segmentation.

The third chapter analyses the relation between the e-commerce and the packaging industry in the pandemic times, further examining the strategies used to overcome the consequences of the crisis. Both domestic and foreign professional journals and books have been used for collecting secondary data. The methods of analysis, synthesis, induction and compilation have been used for processing the data.

2. CHARACTERISTICS OF THE EUROPEAN PACKING INDUSTRY

The European packaging market is the second largest in the region, accounting for around 25% of the global packaging market. It was valued at 195.2 billion EUR in 2018, and the projections suggest the value of 214 billion EUR in 2023 (Packaging Europe, 23.04.2019).

2.1. Packaging and the European packaging industry in general

The European region has been long developing its recognizable packaging industry. Going far back in history, it is supposed that wood and glass have been used for packaging purposes for around 5000 years, while paper and cardboard earned their place in the industry in the early 1900s (Parker, 10.12. 2020). '*Packaging is the planning, creating, manufacturing, wrapping, boxing, or bottling of goods for consumer, industrial, and military markets (vault, N/A).'* The scope of packaging is broad (Yam, 2010). Almost no other industry operates without the help of the packaging industry throughout the world (vault, N/A). A product's packaging is the way the product is recognized and, for the manufacturers, the way they package their products signifies their brand (SMITHERS, 14.01.2020). The packaging industry serves a wide range of purposes in our every-day lives (European Economic and Social Committee, 14.07.2015):

- for protection (prevention of breakage, spoilage and pollution; prolongation of shelf-life);
- for advertising (the ingredients, characteristics, advertisements and labelling);
- for informing (product recognizability, preparation and usage, nutritional data, storage data, contact info, instructions for opening, warnings, after-use instructions);
- for serviceability (product preparation, serving, storing and portioning);
- for utilization (supply of the consumers, retail and transportation unit);
- for handling (transportation from the manufacturer to the retailer, display at the sales location);
- for reducing waste (processing, reusage of the by-product, the energy for storage and transportation).

Seven years ago, the European Economic and Social Committee (10.12. 2014) recognized the need for laying the basis for further development of packaging industry on four key pillars:

1) Resource efficiency.
2) Research and Development and innovation.
3) Social dialogue.
4) Sustainability and adaptation.

An efficient use of resources is the key element in the process of packaging, and it causes environmental concern. The European Commission is aware of the significance the industry has and is continuously trying to help the companies to overcome the difficulties and to familiarize them with the best practices to use the resources at hand optimally. The EESC believes that the discussion for sustainability of this sector must be achieved through civil-society and social dialogue at national and European level (European Economic and Social Committee, 10.12.2014). The European Commission knows that it is necessary to establish the policy of balanced prices of the energy-generating products in Europe to ensure that all the companies on the market operate under same conditions. Steady investments surely represent a way for establishing a long-term successful development of a company.

Capital investments should be simultaneous to the investments in the human resources, which requires careful planning and entering into a constructive dialogue between all the interested parties on this market. Technological innovations and high-quality goods will enable companies to keep their competitive advantage (European Economic and Social Committee, 14.07.2015). There are many new technologies that can facilitate innovation. One such is the technology of intelligent packaging, which uses the communication function of the package to enhance food quality and safety (Yam, Takhistov and Miltz, 2006). The last decade has been crucial for the development of the packaging industry. Digitalization enables easier and faster customization of the packaging, providing the exciting opportunity of product personalization. This trend, reaching its peak in 2020, has been developing over the last years. (SMITHERS, 14.01.2020).

2.2. Segmentation of the packaging market

The European consumer packaging market is segmented by (Mordor Intelligence, 2020):

- *material type:* plastic, paper, glass, and metal
- *end user vertical:* food, beverage, healthcare, and cosmetics personal care and household care
- *country.*

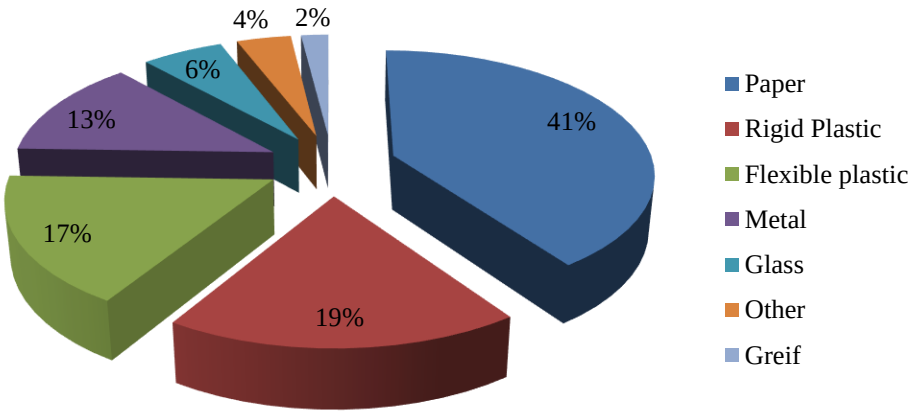


Figure 1: Global packaging market by material (%)
(Source: compiled based on the data from Dempsey, H., Evans, J. (20.07.2021). Pandemic delivers transformation for packaging industry.)

As indicated in Figure 1, the greatest share in packaging manufacturing goes to paper, followed by rigid plastic. What poses a dilemma for most companies on the market is whether the consumers are willing to pay more for the alternative solutions that would to an extent substitute plastic or enable better recyclability of the plastic packaging by, for example, reducing the share of multi-layered packaging or by reducing the share of aluminium. According to the manufacturers' previous experience, especially in the food sector, consumers are extremely sensitive to the price when buying the goods of similar characteristics and quality. This is especially true of the countries with low purchasing power. In year 2020, the pandemic caused the increase of the production of packaging paper (by 2.1%) and sanitary and household paper (3.1%) (Packaging Europe, 16.07.2021). However, the pandemic has, unfortunately, stimulated the decline of graphic grades, including newsprint, whose output fell by 19%. The most thriving players on the European packaging market according to the data on the revenue are: Tetra Pak Inc, UPM-Kymmene, Stora Enso, Smurfit Kappa and Ardagh Group (Parker, 10.12.2020).

However, it is important to note that none of these companies hold the market share that would bring them market dominance, i.e., the European packaging market is highly fragmented. Market fragmentation is certainly a good thing because it means there are many rivals of equal power on the market. In 2021, the European packaging market has remained more fragmented that the American market. In North America, there are six companies holding over 80% of the paper-based packaging market (Dempsey and Evans, 20.07.2021). For European economy, the Single Market is the engine that should be maintained as such. Such strong Single Market can boost investment and innovation, driving the circular economy. A joint industry statement published in June 2021 voiced the efforts of EUROPEN and 62 other European and national organisations from across the packaging value chain. They call on the European Commission to take urgent action regarding the packaging waste-sorting labelling. The aim is to preserve the free movement of goods in the EU and to strengthen sustainability measures. There are too many various requirements on the packaging labelling and information that prevent further harmonization of waste collection and sorting, creating obstacles for Europe's sustainability goals. The review of the Packaging and Packaging Waste Directive presents a valuable opportunity for ensuring effective and harmonised labelling requirements. Due to the efforts put in by the Waste Framework Directive, the European Commission has devoted its time to harmonising separate waste collection and sorting (europen-packaging.eu, 12.07.2021). The possibility of recycling enables the packaging sector to offer a wider range of opportunity and benefits to European economies (European Economic and Social Committee, 10.12.2014).

3. PACKAGING INDUSTRY DURING AND AFTER THE COVID-19 PANDEMIC

In food sector (bakeries, restaurants, supermarkets), the share of packed food has been increasing considerably on the specific markets, in line with the prescribed measures in order to additionally protect the product from the possible contamination with the COVID-19 virus, i.e., to prevent the direct contact with the product. The biggest challenge the manufacturers have been facing is the shortage of the raw material in the first half of 2021, significant rise of the transportation cost (container shipping from Asia where most raw materials come from), delays in delivery of the raw materials and the goods to the customers and the unprecedented rise of the prices of all the key raw materials. Most global raw materials suppliers have declared the coronavirus crisis force majeure because the prices of raw materials have been constantly fluctuating, changing on a weekly basis, making the planning for the packaging firms almost impossible. The current situation regarding the prices is still uncertain, regardless of the fact that the growth of most of the prices has been stagnant. The consequence of the uncertainty is the impossibility to predict if the situation will be stable from September on, or whether new lockdowns and economic shocks will follow.

3.1. E-commerce and packaging industry during the COVID-19 pandemic

E-commerce was on the rise before the pandemic, but now, it has been gaining huge importance. Consumers are using different channels than before for satisfying their purchasing needs and e-commerce shipments and other home-delivery services have been on the constant rise (Feber, Lingqvist and Nordigården, 16.04.2020). Web sales were the dominant mode of conducting e-sales in all EU Member States in 2019 (Eurostat, February 2021). During the second lockdown, at the end of 2020, a survey was conducted regarding the impact of the COVID-19 pandemic on e-commerce. It was conducted by Ecommerce Europe and counts a total of 19 contributions. The findings of the survey suggest that there is a positive public perception for the sector during the pandemic and that the delivery services adapted better to the second lockdown, without major delays even though the second lockdown happened at the end of the year around holidays. Unfortunately, there are some sectors that have experienced a decrease in sales, with some sectors even dealing with a complete lack of sales (Ecommerce Europe, 21.01.2021: 2).

On the other hand, some types of packaging have been rapidly growing in demand, such as those for e-commerce shipments, representing a lifeline for the packaging companies, but also bringing new challenges for them to face (Feber, Lingqvist and Nordigården, 16.04.2020). All layers of the society have been hugely impacted by the coronavirus crisis, including the packaging industry. It has prompted considerable growth of online food purchase, therein stimulating the production of food containers and packaging used for the transport and quality preservation (de Oliveria et al, 2021). Feber, Lingqvist and Nordigården (16.04.2020) projected that some products will be in higher demand, such as packaging for groceries, healthcare products, and e-commerce transportation. They also suggest that demand for some other type of packaging could be declining. This could encompass industrial, luxury, and some B2B-transport packaging. Which packaging companies will be affected depends on their portfolios and area where they operate, end uses for packaging, and substrates. Fortunately, this industry has not suffered such drastic blows as have travel and hospitality sectors (Feber, Lingqvist and Nordigården, 16.04.2020). The pandemic has brought many changes to the purchasing habits of the consumers. It has in a way reduced the need for a product to have that "shelf appeal." The product is viewed online, via photos and descriptions, rather than through the packaging. Consumers choose an easy-open packaging and the manufacturers are going more eco-friendly. However, e-commerce is giving the opportunity for other types of packaging to be developed, like custom-printed boxes and other packaging materials. In 2020, e-commerce enjoyed growth thanks to the pandemic caused by the coronavirus. The same has been happening in 2021. Packaging companies need to be aware of the trends and try to figure out best solutions of responding to these new challenges (TGW Marketing, 28.12.2020).

3.2. Solutions for packaging companies

Together with other sectors, the packaging supply chains have received a huge blow to their business operations due to the COVID-19 pandemic. Now, companies have to rethink their strategies regarding the supply chain, purchasing and logistics (SMITHERS, 14.01.2020). While some firms are facing an increase in demand, others are experiencing decline. Despite that, it is expected that the global packaging market will continue its expansion. What lies in common to all the firms, thriving or stagnating, is that no firm has experienced this type of crisis yet. Surely, the positive thing is that this experience is going to help them in future development, as well as guide them through some new similar crises. Feber, Lingqvist and Nordigården (16.04.2020) list three ways of responding to the crisis, and those are:

- **Creation of crisis-response nerve centre in organization.** The top priority is to protect the health of all the employees and provide a safe way to conduct business operations. Once these top priorities have been sorted out, the crisis centre can then try to understand the shift in consumer thinking. For example, the management can figure out the way to adapt to the boost of online shopping and the increase in demand for food containers. Such centres formed within a firm can manage risks and align all stakeholders.
- **Plan for the comeback.** The plan for the after-crisis operations should be developed by the management of the packaging companies. The recovery strategy should include financial resilience, operational plans and strategic customer-focused moves. The path to "the next normal" is paved with careful planning and identifying packaging categories that are likely to return to strong levels of demand after the crisis.
- **Shape the next normal.** Forming a picture of the next normal is what the packaging companies should strive to. They should try to project the shifts and behaviour of the consumers that will occur after the crisis is over. Some of the possible directions may be the rise in demand for hygiene products or focusing on e-commerce. It is also of great importance to all firms that they rethink their business portfolios in order to ensure the stable cash flows and healthy balance sheets that can protect their business.

Innovation is always a good way of facing new challenges, especially when it is connected to e-commerce. As has already been mentioned, due to the pandemic, e-commerce has been gaining hugely on importance and the demand for protective packaging is increasing. There are many new issues and challenges the manufacturers need to consider, like the design of the product, the logistics and how consumers see the packaging in e-commerce. The firms that choose this strategy and open themselves to e-commerce should consider using lighter materials and higher quality printing for brand logos. Smart packaging technologies are also one of the innovations that can help diversify and enhance the offer (Packaging Europe, 23.04.2019). Food packaging industry is unimaginable without the use of plastic; it makes food packaging safer, prolongs the shelf-life and makes many food products more affordable. However, is poses a serious environmental problem if mismanaged as waste (Kitz et al, 2021). On the other hand, it can be used as a very useful material if managed properly i.e., if all are devoted to its proper reduction, recycling and recovery, thereby preventing leakage into the environment (Parashar and Hait, 2021). The packaging sector can offer a great deal of benefit to European economies because of the possibility to recycle. Regarding the fact that ever more packaging materials have been either recycled, or produced from the recycled materials from other sectors (European Economic and Social Committee, 14.07.2015), the packaging companies can base their further growth strategies on the use of this very material. Regarding metal as the raw material used for packaging, it is projected that the metal compound annual growth rate (CAGR) will rise to 3.1% in the 2020-2025 period – almost twice than it was predicted in pre-pandemic forecasts. The lockdowns in 2020 have caused a surge in demand for food cans of around 10%, because consumers tried to stockpile supplies and canned goods are always in demand during a crisis. Since bars and restaurants have been forced to implement strict anti-coronavirus measures, many opt for buying canned beverages and consuming them in the safety of their homes. However, the crisis has had a serious negative impact on bulk metal containers, fabricated steel boxes, and shipping barrels & drums, suffering 80% of the 2020 demand drop (SMITHERS, 05.11.2020). In terms of sustainability, the goal regarding metal packaging is the use of lightweight materials. There are several directions taken: wider use of lower weight cans ends, and replacement of three-piece cans with two-piece constructions. In aerosols, weight savings are being enabled by the use of alloy slugs, and there is new interest in bag-on-valve designs for both single and dual-dispensing products. Packaging design has never been so important as today and packaging firms are investing in new equipment. Conventional metal packaging print equipment is being supplemented by more inkjet installations enabling innovative and elaborate designs, improved matte or glossy finishes, and tactile effects (SMITHERS, 05.11.2020). All the players on this market should strive to build localized resilient supply chains to be able to more easily tackle future pandemics (Sharma et al., 2020).

4. CONCLUSION

In almost all the countries of the world, packaging industry plays an important role in the development of the economy because the products manufactured in this industry are crucial for other economic branches and so determine the competitive strength of the economy of the country. The European packaging market is the second largest in the world, which has long been acknowledged by the key institutions. In the last years, the European Commission has been introducing directives aiming at ensuring the use of more recyclable packaging and establishing unique regulations on the EU market to enable all the markets of the EU member states to develop under same conditions. In the midst of the pandemic caused by the coronavirus, this market, too, has been shaken. While some segments have experienced a decline in demand, there has been a significant increase in demand for packaging products in food and pharmaceutical industry and e-commerce. The pandemic has boosted the practice of shopping online and significantly influenced the e-tailers' demand for packaging products.

Different packaging manufacturers have been facing the consequences of this crisis in different ways. One of the great challenges they all need to respond to is the significant rise of production costs. To be able to overcome these difficult times more easily, companies can set up crisis-response centres, rethink their business strategies and continuously monitor the needs of their customers, i.e. changes in the behaviour of their final consumers. Besides becoming more eco-friendly, consumers have been directing their attention to the design of the packaging. In line with this, the strategy of investing in innovations emerges as a fine option for successful long-term development. Finding new solutions in production can give a company recognizability and be the base for successful development and long presence on the market.

LITERATURE:

1. Dempsey, H., Evans, J. (20.07.2021). Pandemic delivers transformation for packaging industry. Retrieved 21.07.2021 from https://www.ft.com/content/dfafff92-9e37-4fa4-ab29-ba4c6ea4f1ef.
2. Ecommerce Europe (21.01.2021). *Impact of the Coronavirus on e-commerce*, Brussels: Ecommerce Europe. Retrieved 04.07.2021 from https://www.ecommerce-europe.eu/wp-content/uploads/2021/01/Coronavirus-Survey-Report-January-2021.pdf.
3. Europen-packaging.eu (12.07.2021). The Single Market is the engine of EU's economy and must be preserved. Retrieved 16.07.2021. from https://www.europen-packaging.eu/news/the-single-market-is-the-engine-of-eus-economy-and-must-be-preserved/.
4. European Economic and Social Committee (10.12.2014). *Industrial changes in the European packaging sector*, Brussels: European Economic and Social Committee. Retrieved 13.07.2021 from https://www.eesc.europa.eu/hr/our-work/opinions-information-reports/opinions/industrial-changes-european-packaging-sector.
5. Eurostat (February 2021) E-commerce statistics. Retrieved 08.07.2021 from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=E-commerce_statistics#E-sales_record_a_slight_increase_over_the_recent_years.
6. EUR-Lex (14.07.2015). Mišljenje Europskog gospodarskog i socijalnog odbora o „Industrijskim promjenama u europskom ambalažnom sektoru" (samoinicijativno mišljenje), Brussels: European Economic and Social Committee. Retrieved 13.07.2021 from https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:52014IE0574&from=EN.
7. Feber, D., Lingqvist, O., Nordigården, D. (16.04.2020). How the packaging industry can navigate the coronavirus pandemic, McKinsey & Company (online). Retrieved 19.06.2021. from https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/how-the-packaging-industry-can-navigate-the-coronavirus-pandemic.
8. Kitz, R., Walker, T., Charlebois, S., Music, J. (2021). Food packaging during the COVID-19 pandemic: Consumer perceptions. *International Journal of Consumer Studies*.
9. Mordor Intelligence (2020). Europe consumer packaging market - growth, trends, covid-19 impact, and forecasts (2021 - 2026) https://www.mordorintelligence.com/industry-reports/europe-consumer-packaging-market.
10. de Oliveira, W. Q., de Azeredo, H. M. C., Neri-Numa, I. A., Pastore, G. M. (2021). Food packaging wastes amid the COVID-19 pandemic: Trends and challenges. *Trends in Food Science & Technology*.
11. Pavlović, G. (05.07.2017). Ambalaža i dizajn – Aktualno: Ambalaža dizajnira tržište, Jatrgovac. Retrieved 20.06.2021 from https://jatrgovac.com/ambalazaidizajnaktualnoambalazadizajniratrziste/.
12. Packaging Europe (23.04.2019). Four growth opportunities for packaging in Europe. Retrieved 19.06.2021 from https://packagingeurope.com/four-growth-opportunities-packaging-europe-smithers-pira/.

13. Parashar, N., Hait, S. (2020). Plastics in the time of COVID-19 pandemic: Protector or polluter?. *Science of the Total Environment*, Vol. 759(March), 144274.
14. Parker, T. (10.12.2020). Top five biggest companies in europe by revenue, *NS Packaging Analysis*. Retrieved 23.06.2021 from https://www.nspackaging.com/analysis/packaging-companies-europe/.
15. Print-magazin.eu (07.07.2021). ESKO objavio besplatnu e-knjigu o trendovima u industriji ambalaže pića. Retrieved 14.07.2021. from https://print-magazin.eu/besplatna-e-knjiga-o-trendovima-u-industriji-ambalaze-za-pica-dolazi-iz-tvrtke-esko/.
16. Sharma, H. B., Vanapalli, K. R., Cheela, V. S., Ranjan, V. P., Jaglan, A. K., Dubey, B., Goel, S., Bhattacharya, J. (2020). Challenges, opportunities, and innovations for effective solid waste management during and post COVID-19 pandemic. *Resources, Conservation and Recycling*, Vol. 162(November), 105052.
17. SMITHERS (14.01.2020). 2020 Packaging industry trends. Retrieved 18.07.2021 from https://www.yorksaw.com/packaging-industry-trends/.
18. SMITHERS (05.11.2020). Metal packaging market to see increased demand from Covid-19 new Smithers data reveals. Retrieved 25.06.2021 from https://www.smithers.com/resources/2020/nov/metal-packaging-increased-demand-from-covid.
19. Vault (N/A). Packaging Overview. Retrieved 13.07.2021. from https://www.vault.com/industries-professions/industries/packaging.
20. Yam, K. L., Takhistov, P. T., Miltz, J. (2006). Intelligent packaging: concepts and applications. *Journal of food science*, 70(1), pp. R1-R10.
21. Yam, K. L. (Ed.). (2010). *The Wiley encyclopedia of packaging technology*. Hoboken, John Wiley & Sons, 3rd edition.


UNIVERSITY
NORTH
SVEUČILIŠTE
SJEVER


UNIWERSYTET WARSZAWSKI
WYDZIAŁ ZARZĄDZANIA


Faculté des sciences juridiques
économiques et sociales-salé


MEĐIMURSKO VELEUČILIŠTE U ČAKOVCU
MMVIII