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PROCESS-ORIENTED ORGANIZATIONS IN THE CONTEXT OF THE NEW ECONOMIC REALITY: A CASE STUDY

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***Abstract**: A process approach has gained great popularity in the business of companies around the world. Given that the topic of business processes and process-oriented organization attracts the attention of numerous scientists and practitioners, this confirms its relevance. The paper presents an empirical study from the perspective of a case study of a company in the wood industry. The research aims to determine the maturity level of the process-oriented organization over nine years of the company's operation. Additionally, it analyzes selected profitability indicators, namely: Return on Assets (ROA), Return on Equity (ROE), net profit margin ratio, and EBITDA. Data were collected using both primary sources (interviews with the management of the process-oriented company) and secondary sources (financial reports and business process documentation from 2014 to 2022). Based on the analysis of the collected data, it was observed that the company has a high degree of maturity in applying the process approach. Interviews with the organization's management and documentation indicate that the progression from the initial level to a high level of maturity in business process management has positively impacted profitability indicators.*

***Key words**: process-oriented organization, profitability, process maturity, performance.*

JEL classification: M10, L25

1. INTRODUCTION

Business processes are a very important management paradigm in the 21st century, and so the process approach has gained large popularity in company operations all over the world. Many companies call themselves process-based systems, but most of them are functionally based on just a few elements of the process approach. Accepting a process approach in business represents a revolutionary change, which actually represents an organization's recomposition. The organization's process orientation implies changes, not only in an organization's structure, but also in the organization's focus, the changes in the business success measurement system, as well as the changes in the relationships with customers.

The author Kordovan explains the transition from a functional into a process-based organization, and calls such an approach a strategy of transformation, which consists of nine steps divided into three levels. Actually, such steps make up the levels of transition from a functional into a process-based organization, and that is why the abovementioned strategy is not simple, and a certain time is needed for achieving process maturity (Kordovan, 2011). The three key levels of the transition from a functional into a process-based organization are managing the transition program, process management and improvement management (Kordovan, 2011).

In process-based organizations, the focus is on customers in relation to function-based organizations, whose focus is on the managers. There are various characteristics in which process-based organizations differ from classic or function-based companies, and some of them are business focus, organizational unit, defining work tasks, the role of management, the key person, the reimbursement and business culture (Bosilj Vukšić & Kovačić, 2004). Regarding organizational units, in function-based organizations, there are departments, while in process-based organizations, there are process teams which comprise team members and the

process owner who provides mentoring support to the rest of the team. The work tasks in a function-based organization are narrowly defined, while they are flexible in a process-based organization. Organizational culture in classic companies is based on hierarchical levels, where the focus is on superiority, thus there are often conflicts between managers and employees. However, in process-based organizations, the organizational culture is based on the cooperation of process teams. In process-based organizations, the reimbursement is based solely on the attained results, and so in these companies, there is an established reward system, while in classic or function-based companies, rewards are based on the implementation of activities. Based on everything abovementioned, it is stated that the main characteristics of a process-based organization are: fewer hierarchical levels, interfunctionality, the existence of the process owner, process teams, continuous training and professional enhancement, employee reward system, customer focus, the application of information technologies for more efficient business process management, and the organizational culture based on the cooperation between employees and employers.

Today every organization that wants to endure and be competitive in the market ought to represent the concept of business process management. Process orientation places its focus on achieving desired business performance, and that is why process orientation is shown as one of the conditions for providing high organizational performance (Devane, 2004). Accordingly, special attention in the paper is given to the examination whether a greater level of maturity of a process-based organization influences financial performance positively. Hamer (2007) adopts a phased approach to process management, emphasising that all the previous phases need to be entirely completed before it is proceeded to the next phase (i.e. greater maturity). Hamer model clearly highlights the difference between process maturity and enterprise maturity (process management). In accordance with this, Hamer differentiates between five levels of process management maturity (Hammer, 2007): initial, managed, defined, prediction and optimized.

The level of enterprise maturity was assessed in the case study based on the BPO (Business Process Orientation) process maturity model. In this model, organizations are ranked on a scale from 0 to 5, where level 0 indicates an organization that is not process-oriented, while level 5 indicates a fully process-oriented organization.

2. LITERATURE REVIEW

The appearance of the work "Total quality management" by the authors Hammer and Champy (1993), is considered to be the key moment for the process orientation development. Since then, there has been a great number of papers witnessing that business process management is a key task of an enterprise in modern conditions of business operations (Radosavljević, 2016).

A business process is a series of logically related activities which use the enterprise's resources, and whose ultimate goal is satisfying customer needs for products or services of appropriate quality and prices, in the adequate period, with the concurrent realisation of values (Bosilj Vukšić & Kovačić, 2004). Business processes need to be detailed, stable, adjustable to the needs of every client, in a word, they need to be efficient. In every organization, it is necessary to recognise the business process and its internal rules, and then describe those processes with the help of theoretical knowledge of the process. Only then can a clear understanding of business processes in an organization be acquired (Radosavljević, 2016). The author Zairi emphasised that "the best organizations recognised the need for shifting focus from a traditional, function-based approach to managing via a set of clearly defined, customer-guided processes" (Zairi, 1997) in his paper "Business process management: A boundary-less approach to modern competitiveness to modern competitiveness". Process mining is of vital importance in business process management. Information technology experts believe that business process management is a common language through which we can communicate with business stakeholders (Božić, 2021). Process mining can contribute to business process management and perceiving bottlenecks. Their elimination concerns preventing unnecessary states, redoing the same activities and perceiving those which require too much time to be completed (Božić, 2021).

Davenport defined a business process as a structured, measurable set of activities designed to produce specific results for a certain market or a customer, and it also includes a strong emphasis on how the business develops within an organization (Davenport & Short, 1990). The efficient implementation of all the processes in an organization requires adequately trained performers who will follow all the possible changes in the process with the help of their knowledge and skills, as well as an appropriate reward system (Radojević et al., 2009). In a process-oriented organization, employees play a

crucial role. Therefore, employees in a process-oriented organization should undergo continuous improvement and training to acquire new knowledge and skills. The study of emotional factors plays an important role in the fields of psychology and management. Company leaders must be aware that emotions play a crucial role within the organization. To acknowledge this, leaders should possess a certain level of emotional intelligence to recognize and comprehend the emotions of their employees. Emotional intelligence is equally important for the company's employees, especially when engaging in tasks that involve teamwork. Enhanced emotional skills instigate improved interpersonal relationships. A high level of emotional intelligence can also assist employees in establishing and maintaining positive relationships with external partners (Mura, Machova & Zsigmond, 2021).

Business process management (BPM) is known as a concept which implies modelling, performing (including automatization) and evaluation of a process, which has been stated and explained in the works of numerous authors (zur Muehlen & Indulska, 2010; Antunes & Mourao, 2011; Pyon et al., 2011). Today, most process-based organizations use business process management software, which increases business operations efficiency. The use of business process management software means that the employees in an organization spend less time on repetitive manual processes, and thus have more time to focus on doing their jobs and increasing productivity. The software enables enterprises to document and standardise business processes and enable quick responses to changes by introducing new processes in an organization.

Organizations have to face the fact that the environment is constantly changing, and that process management has become a very important way for organizations to adapt to new changes (Burlton, 2001). Therefore, being process-based implies a more pronounced aspect of processes, but also a greater orientation towards the organization (Smith & Fingar, 2003). The most important characteristic of process orientation is identifying the process owner, because it helps to overcome the greatest limitation of a classic enterprise organization, and that is the issue of responsibility (Đuričin & Janošević, 2006).

Organizations make decisions about which processes and competencies need to be focused on, and the basis for process management is performance measurements. Organizations develop strategies in order to improve processes and thus enhance customer satisfaction (Dobrosavljević & Urošević, 2019). Therefore, the main purpose of the process is satisfying customer needs. In that sense, a business process can be interpreted as a structured set of activities, with a well-defined beginning and ending, in which enterprise resources are used to create value for customers, satisfy their requirements regarding quality, price, time and flexibility. In defining the process itself, the fact that each process comprises five key elements is especially emphasised: customers, a set of activities, inputs (resources) and outputs (products and services), people and technologies (Sikavica & Hernaus, 2011).

It is very important for process-oriented organizations to monitor company performance. Process performance is a measure of achieving the desired results of the business process. The main purpose of measuring process performance results is to identify the procedures necessary to generate objective information about business processes. Performance measurement involves assigning numerical values to indicators and helps identify problems and improve operations. When measuring process performance, choosing a method for evaluating objective results is crucial. This represents a chance for the company to identify where improvement is needed in the processes and to quantify the values of the performance indicators. Improving process performance contributes to increasing quality and productivity in the enterprise (Kicová, 2019).

Profitability is one of the most important indicators for any company, including process-oriented companies. The authors Marković and Savović (2022) used three indicators in their paper to measure the impact of acquisitions on profitability: return on assets (ROA), return on equity (ROE) and return on sales (ROS).

Contemporary research in the field of accounting and finance emphasizes the importance of financial reports and indicators in assessing the value of a company and the quality of its financial operations (Lehenchuk et al., 2023). Financial statements are a crucial source of information for the economic and financial analysis of companies over time. They provide insights into the operations and financial capabilities of these entities, as well as their relative position in relation to the environment and global economic trends. Financial statement analysis enables research into the relationships between various items in the statements, facilitating an accurate assessment of the financial position, liquidity, and business performance of companies (Janaćković et al., 2022). The primary business goal of every

company is profit growth; however, the strategic goals of the company are strengthening the market position through the improvement of business digitalization, increasing revenue with innovative business opportunities as well as increasing efficiency (Aleksić et al., 2022). A developed financial system encourages competition, expands the market and increases the efficiency of financial institutions. The depth and the breadth of financial markets are growing, which is transfered to the performance and structure of the economy (Cvetković et al., 2021). Countries in transition are the best example of the impact of market changes on the economy. Competition law has a significant role in the legal regulation of the market and market changes (Damjanović, 2016).

The process management maturity, which implies the level of process orientation that the enterprise has reached, has attracted the attention of a number of authors (Humphrei, 1988; Zairi & Ahmed, 1999; Maull et al., 2003; Fisher, 2004, Rosemann, De Bruin & Hueffner, 2004; Hamer, 2007; Lee et al., 2007; Curtis & Alden, 2007; McCormack et al., 2009; Van Looy et. al., 2011; Roeglinger et al., 2012; Wendler, 2012). Depending on how successful it can be in process management, according to the business excellence models, the enterprise can be at one of the three levels (Robinson, et al., 2006): Start up, On the way, Mature.

At the Start up level, the enterprise is at a low maturity level, which means that such enterprise is characterised by few identified business processes, ad hoc measurement of the process performance, manual process guidance, inefficient resource management, the lack of applied methodology, reactive action. On the other hand, an enterprise that is at a high maturity level applies structured methodology, has precisely defined processes as well, identified process owners, constantly measures process performance, acts proactively and uses information and communication technology (Radosavljević, 2016). Therefore, the aim of the research in the paper is to prove if a higher level of maturity of a process-based organization positively affects its business performance.

3. CASE STUDY

The aim of the research is to determine the level of maturity of a process-oriented organization within the context of a nine-year business operation in the wood industry. Additionally, the goal is to analyze selected profitability indicators, including ROA, ROE, net profit margin ratio, and EBITDA. A specific company from the wood industry was selected for the purpose of the case study. This company was chosen based on previous market research in the Bijeljina area, which identified it as representative for the analysis of the case study regarding the identification of the maturity level of a process-oriented organization. Since the company met all initial criteria for analysis, such as following a process-oriented approach and being focused on business processes for several years, further research was conducted. Data were collected using primary sources (interviews) and secondary sources (financial reports, business process documentation), providing a broader picture of the company's operations and enabling a more detailed analysis. The collected data underwent analysis to determine the maturity level of the process-oriented organization over the nine-year business period. Additionally, selected profitability indicators were analyzed to examine the trend of these indicators during the observed period.

The research was conducted on a sample of an enterprise in the Republic of Srpska, which is situated in the region of the city of Bijeljina. The enterprise has over 250 employees, which places it in the group of large enterprises within the processing sector, whose main business activity is the processing and production of wood products for the construction industry. Furthermore, the enterprise has a long, successful business tradition, and has its own maintenance workshop and its own vehicle fleet at its disposal, and modern technical-technological equipment of high productivity. The greatest focus is placed on the production of massive laminated plates, construction carpentry, the production of furniture and briquettes, and other carpentry products characterised by a high level of quality. The company management plans and develops the processes necessary for product realisation. The planning of these processes is consistent with the requirements of other quality management system processes. In planning product realisation, the requirements of product quality determined during contracting are planned. A manager of technical preparation and development produces operational plans for the realisation of the production process based on specified orders of buyers, a monthly production plan and based on the previous month’s production realisation, so that the production is harmonised with the annual business plan.

3.1. IDENTIFICATION OF THE LEVEL OF MATURITY IN A PROCESS-ORIENTED COMPANY

The company from the case study has been basing its business on a process approach for many years,

and has managed to reach a high level of maturity in business process management, which is confirmed in the following work. Specifically, the research will focus on:

1. Measuring the level of maturity of a process-oriented organization;
2. Collection and analysis of financial data in order to evaluate the profitability performance of the organization: net profit margin ratio, ROE, ROA and EBITDA.

Numerous world scientists and experts have written about process maturity, different maturity models of process orientation as well as their impact on company performance (Ivančić, 2018; Milanović Glavan, 2019; Skender, 2020; Vasiljević, 2020; Gudelj, 2021). From all mentioned, the work of the author Lucija Ivančić "Models of process maturity in the improvement of process orientation: a case study" (2018) stands out, which is aimed at testing tools for determining maturity according to the BPO model, which is the inspiration for the application of the methodology in this work. Given that a small number of authors have researched and evaluated the maturity of companies in the Republic of Srpska, the subject of this paper is precisely based on the analysis and evaluation of the process maturity in the company that was selected in a targeted manner. The selection of the company for this case study was based on three facts:

1. the company uses concepts from the field of business process management to improve operations,
2. the company has a long tradition of operating on the market,
3. the company belongs to the group of large companies (according to the number of employees), which means that it could have a fully developed business process management system and benefit from it, which makes it suitable for analysis.

The BPO (Business Process Orientation) process maturity model is one of the models used to assess the maturity of a process-oriented organization. In this model, organizations are ranked on a scale from 0 to 5, where level 0 indicates an organization that is not process-oriented, while level 5 indicates an organization that is completely process-oriented. Three categories of questions were constructed by giving a rating on a Likert scale with values from 1 to 5, making up the questionnaire. According to the BPO model, there are several main determinants of process orientation (McCormack et al, 2009; Ivančić, 2018): process view, business processes, and process management and measurement. Accordingly, the questionnaire on organizational process maturity consists of three categories:

1. Process view;
2. Business processes;
3. Business process management and performance measurement.

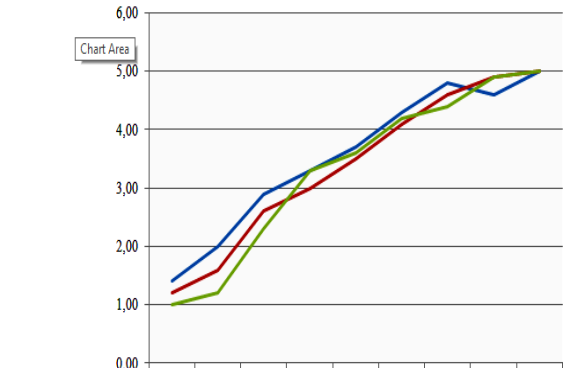
Interviews represented the primary technique for gathering data from the company's management. The interview questions were both general about the company's operations and specific about its business processes and management. After the general questions, specific questions were posed in the form of statements, where members of the management, participating in the interview, expressed their degree of agreement or disagreement with the statement along with detailed explanations. Each category of questions consisted of a total of five statements, distributed across the aforementioned question categories. For easier presentation of the results, each category of (dis)agreement was assigned a corresponding number. Accordingly, complete disagreement was indicated by the number 1, while complete agreement with the given statement was represented by the number 5. Through conducting interviews with the company's management, responses were obtained regarding questions related to the process-oriented approach across three dimensions: process view, business processes, and process management and measurement. The interview questions were carefully selected in order to obtain as much data as possible necessary for analysis. Interviewing the management of the company lasted a long period of time, during which some time was also spent talking with the management of the organization about their business. After the interviews, there was a joint review of documentation on business processes and the course of business processes, as well as parts of financial reports required for research. After presenting the results within the previously mentioned three dimensions of the process approach, the determination of the maturity level of the process-oriented organization, which is the subject of the case study, was also determined.

The process view refers to understanding an organization's business through processes that are interconnected and form a unified whole. Instead of the traditional functional view that focuses on different departments in an organization, the process view focuses on the movement of activities through the organization to create value for customers and other stakeholders. In addition, employees in the enterprise are familiar with the concept of processes and apply it in their daily business operations (Ivančić, 2018). Business

processes are activities performed within a process to achieve the process goal. Employees are fully involved in the functioning of business processes, and all employees, especially members of a process team, understand the process as a whole. Process management involves understanding and documenting processes, identifying opportunities for improvement, optimizing processes to improve organizational performance, and continuously monitoring processes. Process measurement is the practice of measuring process performance to determine if processes are being performed in accordance with desired organizational standards and goals. Enterprise leadership is continuously focused on improving the monitoring and measurement of business processes, supported by information technology.

Each of these dimensions was evaluated with a corresponding rating by each member of the company's management (Figure 1).

Figure 1. Presentation of the maturity level of a process-oriented organization from three dimensions



	2014	2015	2016	2017	2018	2019	2020	2021	2022
Process view	1,40	2,00	2,90	3,30	3,70	4,30	4,80	4,60	5,00
Business process	1,20	1,60	2,60	3,00	3,50	4,10	4,60	4,90	5,00
Process management	1,00	1,20	2,30	3,30	3,60	4,20	4,40	4,90	5,00

Source: The authors

McCormack and Johnson (2001) conducted an important empirical study that analyzed the relationship between process orientation and business performance. The results of the study showed that the presence of process orientation in an organization positively impacts the reduction of conflicts within the organization, as well as improving the connectivity among employees. Additionally, the research indicated that the presence of process orientation leads to improvements in the business performance of the organization. This research highlights the importance of process orientation in achieving better performance and success for the organization.

McCormack and Johnson set definitions and numerical ranks (from 0 to 5) for the four stages that an organization must go through to reach the highest level of process maturity (McCormack & Johnson, 2001):

1. Ad hoc processes (first phase);
2. Defined processes (second phase);
3. Related processes and process management (third phase);
4. Integrated processes (fourth stage).

Table 1. The phase of the maturity model BPO (Business Process Orientation)

THE PHASE	**PHASE NAME**	**PHASE DEFINITION**
1	**Ad hoc processes**	The ad hoc stage, the initial phase in the process maturity model, lacks a structured organizational approach, with processes often being unclear and informal. At this stage, the organization typically lacks a clear strategy for managing processes, relying on individual employee efforts rather than formalized procedures, and process performance measurement is often subjective, ranking from 0 to 2 in the Business Process Orientation (BPO) scale.
2	**Defined processes**	It is the second stage in the BPO process maturity model, which represents a step further in organizational maturity compared to the ad hoc stage. In this phase, the organization defines its key processes and establishes documented procedures and standards for their execution. Organizations reach this maturity level with a BPO rank between 2 and 3.
3	**Related processes and process management**	In this phase, process owners are established, and process management is introduced to align with strategic goals, enhancing efficiency. Organizations aiming for process orientation achieve this level, typically with a BPO rank between 3 and 4.
4	**Integrated processes**	In this phase, the organization achieves high process automation, continuous improvement, and integration of all processes into a cohesive system. Real-time monitoring ensures optimal functionality, while advanced technologies drive efficiency. This maturity level, typically ranked between 4 and 5 on the BPO scale, focuses on sustained growth and innovation.

Source: The authors according to McCormack, K.P. & Johnson, W.C. (2001). Business Process Orientation — Gaining the E-Business Competitive Advantage, St. Lucie Press, Florida, p. 51-53.

From the attached, it can be seen that the company in the period from 2014 to 2022 went through all the stages of the BPO maturity model previously explained in Table 1, so that we can finally conclude that the company is currently at the highest level of process maturity.

3.2. ANALYSIS OF PROFITABILITY INDICATORS IN A PROCESS-ORIENTED ORGANIZATION

In this section of the case study, a detailed analysis of selected profitability indicators of the company has been conducted. The primary focus of the analysis will be on the following key profitability indicators:

- ROA (Return on Assets): This indicator allows us to assess the efficiency of the company's asset utilization in generating profit. A high ROA suggests efficient asset utilization for profit generation. The formula for calculating ROA is:

$$ROA = \frac{Net\ Income}{Average\ total\ Assets}$$

- ROE (Return on Equity): ROE provides insight into the efficiency of the company's use of owner's equity capital. A high ROE indicates high profitability relative to the invested equity capital. The formula for ROE is:

$$ROE = \frac{Net\ Income}{Average\ Equity}$$

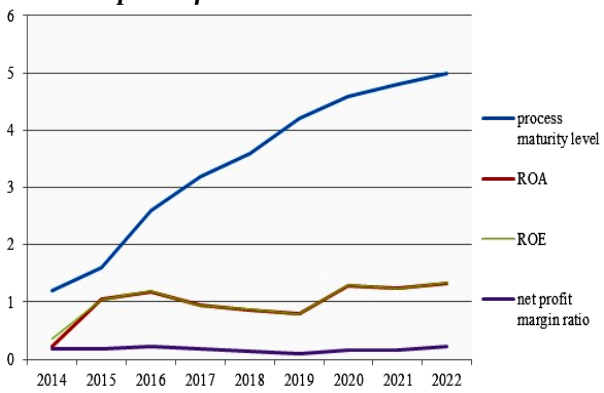
- Net Profit Margin Ratio: This indicator provides insight into the efficiency of managing operational costs and the overall profitability of the company. A high net profit margin indicates high profitability after subtracting all operational costs. The formula for the net profit margin ratio is:

$$Net\ Profit\ Margin = \frac{Net\ profit}{Total\ Revenue}$$

- EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization): We will analyze EBITDA to understand the operational profitability of the company, excluding the impact of interest, taxes, depreciation, and amortization. This indicator provides insight into operational efficiency and the ability to generate profit from the company's core operations.

Through the analysis of these profitability indicators, we will have a comprehensive insight into the profitability performance of a process-oriented organization from the wood industry during the nine-year operating period.

Figure 2. Analysis of trends in profitability indicators and the level of process maturity in the period from 2014 to 2022.

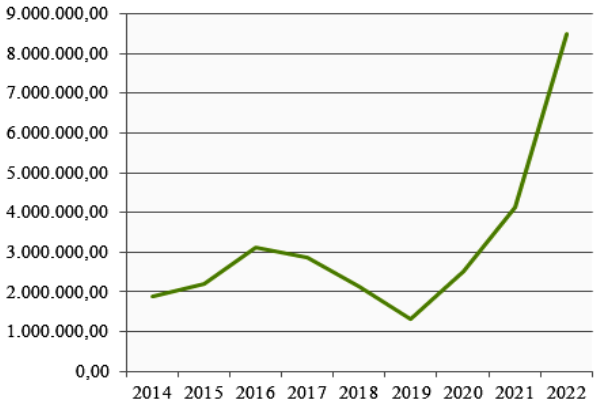


Source: The authors

The level of process maturity of the organization is continuously growing during the period from 2014 to 2022, but there are minor oscillations in the trends of profitability indicators. Although there is no clear linear trend between the level of process maturity and financial indicators, such as ROA, ROE and the net profit margin ratio, it can be noted that the highest values of these indicators are often associated with years when the level of process maturity is also high. However, it is not a consistent pattern, as there are exceptions such as 2017. Of course, there are a number of other factors that can influence the movement of ROA, ROE and the net profit margin ratio, with the company's management emphasizing that the efficient management of business processes significantly improved profitability indicators compared to the period when the traditional business concept was represented.

There is an obvious trend of EBITDA growth during the analyzed period from 2014 to 2022. This indicates that the company achieved significant growth in operating profit during that period. The sharp jump in EBITDA in 2022 is especially significant, where the value of EBITDA increased significantly to 8.495.870,00.

Figure 3. EBITDA trend for the period from 2014 to 2022.



Source: The authors

This may indicate significant changes in the business environment or company strategy, as well as an improvement in operational efficiency or an increase in revenue. A sharp increase in EBITDA in 2022 can have a significant impact on other financial indicators, such as ROA, ROE and net profit margin. This may indicate a general improvement in the company's profitability during the observed period.

CONCLUSION

Organizations that implement a process approach often adopt a systematic approach to managing business activities, identifying, analyzing and improving key business processes to achieve efficiency and improve product or service quality. This approach is often used in various industries, including manufacturing and services, to achieve competitive advantage and long-term market success.

The research aimed to analyze the level of process maturity and profitability of companies from the wood industry over a period of nine years (2014-2022), using indicators such as ROA, ROE, net profit margin ratio and EBITDA. Through a case study of a selected company from Bijeljina, a high level of maturity in the application of the process approach was established, supported by the continuous improvement of business processes and product quality.

By analyzing the level of process maturity, financial performance (ROA, ROE, net profit margin ratio) and EBITDA during the period from 2014 to 2022, we observe a general trend of growth in process maturity and operational profitability of the company, while financial indicators vary between years. Of particular note is the significant jump in EBITDA in 2022, which indicates positive financial dynamics and a potential improvement in operational efficiency during that period. Nevertheless, the lack of a clear correlation between the level of process maturity and financial performance indicates the need for additional research to better understand the factors that influence the financial results of companies. Here it is important to emphasize that the level of process maturity does not only affect the increase of the observed indicators, but that it is certainly important to analyze, given that the goal of process orientation is precisely to satisfy the needs of consumers (customers), which is certainly reflected in the profit of such an organization. If a process-oriented organization realizes and satisfies the needs of its consumers, the demand for the products or services of such an organization grows, which brings higher business income and which is further reflected in higher profits.

Recommendations for further research refer to taking into consideration more case studies, more companies within one or more economic activities, and to carry out a quantitative analysis. Expanding the sample to more companies from the wood industry, as well as to companies from other economic activities, would allow a better understanding of general trends and differences in process maturity and financial performance among different industries. Conducting a quantitative analysis on a larger sample of companies would enable the identification of statistically significant relationships between the level of process maturity and financial indicators. This would enable a more precise quantification of the impact of process maturity on financial performance. Also, the satisfaction of employees who are directly involved in business processes can be investigated, as well as the way in which they perceive the process approach. From statistical analysis, different types of research can be performed to better understand the relationship between process maturity and the financial performance of a company. Identification and measurement of the strength of the relationship between the level of process maturity and various financial indicators such as ROA, ROE, net profit margin ratio and EBITDA. This would enable an assessment of the degree of influence of process maturity on financial performance. Comparing differences in financial performance between groups of companies of different process maturity in order to determine whether there is a statistically significant difference in financial results between those groups.

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PERCEPTIONS OF MILLENNIALS ON THE PRACTICE OF FLEXIBLE WORK ARRANGEMENTS IN SERBIAN IT SECTOR

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***Abstract**: The need for research arose due to the rapid development of information technologies, robotization, digitization of business, economic, health (Covid-19), energy and other crises, as well as changes in the demographic structure of the workforce. These changes have led to the increasing application of various forms of flexible work arrangements, and special emphasis is placed on employees in the IT sector who, due to the nature of their work, have a greater possibility of application. The work aims to examine the level of application of different types of flexible work arrangements according to Cranet research methodology and perceptions according to Startit research on a sample of 146 highly educated millennials who belong to the private IT sector in the Republic of Serbia. The results indicate that flexi-time records the highest level of application, that teleworking during the Covid-19 pandemic records the highest level of application by comparing before, during and after the pandemic, as well as that employees are comfortable with this way of working, but there are also certain problems when applying such that loneliness occurs while working from home, more precisely that they miss their colleagues, that employees have to take care of children and work more than before. To solve the mentioned problems, IT companies must adapt various forms of flexible work arrangements to establish a balance between work and private life and positively influence on attitudes and behaviors of young employees.*

***Key words**: flexible work arrangements, IT sector, millennials, private sector, highly educated employee, Republic of Serbia*

JEL classification: M10, M50

1. INTRODUCTION

Due to the development of IT, globalization, digitization of business, increasing competition on the market, as well as the increasing impact of the economic crisis, political crisis (war between Russia and Ukraine), health crisis (Covid-19 pandemic), etc. companies around the world had to change their way of doing business to survive on the market but also to become leaders in their field of business (Gašić & Berber, 2023). Spreitzer et al. (2017) emphasize that the implementation of various forms of flexible working arrangements has increased rapidly over the last decade and that a remarkable jump was observed due to the outbreak of the Covid-19 pandemic (Sinclair et al., 2020).

One of the growing trends in facing organizations with the aforementioned challenges is the

application of various forms of flexible work arrangements, which according to the authors Kossek & Michel (2011), and Rau & Hyland (2002) refer to where (flexi place), and when (flexi-time) work activities are carried out. That is, flexible working hours refer to the employee's control over working hours, more precisely including adjusting the start and end time of work (compressed work schedule, reduced working hours and ease of taking days off). While on the other hand, Flexi-place refers to a policy that allows employees to carry out work activities in locations that do not require constant physical presence at the company's workplace (such as remote work, or home-based work). These two stated policies are thus designed to meet the specific needs of employees who are focused on the time and place of work to maximize the positive effects of flexible work arrangements for both employees and the organization itself (Wheatley, 2017).

The subject of the research is determining the perception of highly educated millennials who are employed in the private IT sector in the Republic of Serbia on the application of various forms of flexible work arrangements to provide such employees with those work arrangements that will have a positive effect on work attitudes, employee behaviors such as work engagement, job satisfaction, commitment, innovative work behavior, employee performance, motivation, productivity and efficiency, and employee loyalty to the company and its values. Also, the aim is to determine to what extent different forms of flexible work arrangements are implemented and what impact the implementation has on employee productivity. In addition to the main advantages, the goal is also to determine the negative sides of working from home. Based on the presented perceptions, the goal is to give recommendations to employers and employees who use this form of work.

The research consists of theoretical and empirical research. The theoretical part of the research is aimed at explaining the concept, importance, and types of different forms of flexible work arrangements, which, under the influence of various factors, have seen a significant increase in application. The authors in the empirical research analyzed eight questions taken by Startit (2020) regarding the implementation of various forms of flexible work arrangements on a sample of 146 millennials in the private IT sector of the Republic of Serbia. After that part, as part of the concluding discussion, the authors summarized the entire research and highlighted significant segments that should be paid attention to by both employers and employees.

2. FLEXIBLE WORK ARRANGEMENT

Flexible working arrangements are a necessary phenomenon of today's digital society, where organizations are forced to adapt their way of doing business to overcome the various challenges they face, such as the increasing development of information technologies, strong competition, globalization, digitalization of business and various crises such as health (Covid-19 pandemic) which had a significant effect on increasing the level of application of various forms of flexible work arrangements such as flexible working hours, remote work, etc. as well as economic, political, environmental and other crises. Berber & Slavić (2019) conducted a factor analysis of 12 types of flexible work arrangements, and the analysis showed that 12 types of flexible work arrangements according to the Cranet research methodology can be grouped as follows: the first group consists of weekend work, shift work and over time, the second group: flexi-time, remote work, and home-based work, the third group: compressed work schedule, job share, part-time, and the fourth group: fixed term contract, annual hours contract, and temporary job.

Allen & Shockley (2009, p. 267) emphasize that flexible working hours is a concept that allows employees to adjust their working hours according to their needs, within certain frameworks determined by the employer. More specifically, some of the forms of flexible working arrangements such as working from home, flexible working hours, etc. can be applied to balance business commitments with private life. This approach usually implies more autonomy for employees when organizing their working time, which can contribute to increased productivity and job satisfaction. The application of flexible work arrangements must be coordinated with the company's activities and the positions of the employees in the company. The nature of the work requires some employees to be physically present at work (factory workers) or at customer sites (eg, site-independent service engineers) and thus creates a gendered workforce in terms of choices regarding work locations (Felstead, 2022). Wheatley et al. (2023) point out that the pandemic resulted in the blockade and social distancing of employees and that this forced many organizations to apply remote and hybrid work.

Flexible work arrangements have their positive and negative sides, the results of the authors Shifrin & Michel (2022) indicated that flexible work arrangements are associated with better

physical health, reduced absenteeism and fewer somatic symptoms. This suggests to us that flexible work arrangements can facilitate employees in maintaining their health. The positive effect of the application of flexible working arrangements on the establishment of a balance between the work and private life of employees was determined in the works of authors Hayman (2009), and Dizaho, Salleh & Abdullah (2017). Also, by applying different forms of flexible work arrangements, there is a reduction in the level of stress by establishing a balance between work and private life, which was shown in the work of the authors Subramaniam et al. (2020). Positive effect on work attitudes and behaviors of employees such as work engagement, commitment, intention to leave, innovative work behavior, and employee performance, etc. it was established in the works of. Gahlawat & Kundu, 2019; Gašić & Berber, 2021; Berber et al., 2022; Tsen et al., 2022; Gašić & Berber, 2023; Stavrova et al., 2023; Qi et al., 2023.

Some of the basic negative sides of the application of flexible work arrangements is the loneliness of employees, during remote work, employees have moved away from each other (Miyake et al., 2021; Becker, 2022), especially during the period of the Covid-19 pandemic. The application of various forms of flexible work arrangements under the influence of modern challenges has forced some employees to be available outside of their working hours, which can have a negative impact on maintaining a balance between private and work life (Russell, O'Connell & McGinnity, 2009), which additionally leads to increased stress among employees (Titopoulou et al., 2019). Vasic (2020) emphasizes that an adequate strategy aimed at the implementation of various forms of flexible work arrangements (in the specific case of remote work) would lead to greater employee loyalty to the organization and satisfaction. He also emphasizes that employees need appropriate leadership and support for remote work because remote work cannot be successful enough if support is not provided, including regular training, and even psychological support in case of burnout and stress.

3. METHODOLOGY

To determine the perceptions of highly educated millennials about the practices of flexible work arrangements in the private sector of the Republic of Serbia, a Google Forms electronic questionnaire was created to collect a sample. As part of the research methodology, the questionnaire that was used as well as the research sample will be explained.

3.1. SURVEY

As mentioned, an electronic questionnaire was created to collect the necessary sample for analysis. The advantage of the electronic questionnaire is that the respondents had the opportunity to answer the questions at any time, wherever they were, using their electronic devices. The questionnaire consisted of two parts, the first part included control questions (gender, level of education, position in the company, headquarters of the organization, and the organization you work in a national organization, a branch of a national organization, an international organization, a branch of an international organization). The second part of the questions included one question about the application level of different forms of flexible work arrangements according to the Cranet research methodology, as well as seven questions taken from the Startit (2020).

3.2. SAMPLE

After the electronic questionnaire was created, it was distributed to employees who work in the private IT sector and belong to the Y generation age group in the Republic of Serbia. This layer of employees was selected because they often show a greater preference for flexible work arrangements for several reasons, namely: the workplace culture that is characteristic of the IT sector in the sense that it has a more liberal workplace culture that supports flexible work arrangements. Younger employees in such an environment often have greater opportunities to use such arrangements. Technological literacy (they often have a high level of technical literacy, which allows them to work outside the headquarters of the company office using various remote work tools such as video conferencing, online collaboration tools, etc., then adaptability to life in the sense that they often value the ability to adjust working hours to their life needs such as different hobbies, education, travel, and this way of working allows them to achieve that. time management.

The collection lasted from September 2021 to September 2022. The focus was on millennials who work in the IT sector in the Republic of Serbia. Questionnaires were personally sent to the collected address base of IT companies that were found by electronic search, as well as by posting on the LinkedIn business network. As a result of the survey, 162 employees filled out the questionnaire, but with the application of selection to narrow the sample to employees who are highly educated and work in the private IT sector in the Republic of Serbia, the final number of respondents is 146.

Table 1. Sample characteristics

Gender	N	%
Male	80	54.8
Female	66	45.2
Level of education	N	%
Bachelor's degree	44	30.1
Master study	98	67.1
Ph.D.	4	2.7
Position in organization	N	%
Manager	35	24
Professional worker	111	76
Headquartered of the organization	N	%
Republic of Serbia	77	52.7
EU	39	26.7
Non-EU country	10	6.8
USA	20	13.7
The organization you work for is:	N	%
National organization	52	35.6
Branch of a national organization	2	1.4
International organization	29	19.9
Branch of international organization	63	43.2
Total:	146	100

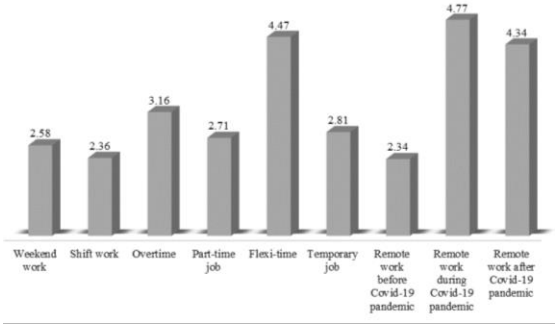
Source: Authors of research

Table 1 indicates that out of a total of 146 employees in the private IT sector working in the Republic of Serbia, the largest number of them are men (N=89, %=54.8) while the rest are women (N=66, %=45.2), that is about highly educated employees, where the largest number of them have completed master's studies (N=98, %=67.1), then bachelor's degree (N=44, %=30.1), and Ph.D. studies (N=4, %=2.7). The largest number of them work in the position of professional workers (N=111, %=76), while the rest of them are managers (N=35, %=24). Analyzing the headquarters of the organization where they are employed, the largest number of them marked the Republic of Serbia (N=77, %=52.7), EU (N=39, %=26.7), USA (N=20, %=13.7), while the smallest number of them marked Non-EU country (N=10, %=6.8). By reviewing the answers to the question "The organization you work for is", the largest number of respondents marked Branch of international organization (N=63, %=43.2), National organization (N=52, %=35.6), International organization (N=29, %=19.9) And the smallest number of them indicated the branch of a national organization (N=2, %=1.4).

4. RESEARCH RESULTS AND DISCUSSION

After the presented questionnaire and sample, in the third chapter, a graphic presentation was made on the level of application of various forms of flexible work arrangements according to the Cranet research methodology, whether they would like to work outside the office, even after the Covid-19 pandemic and for how many days, the assessment of the productivity of working from home compared to working in the company office, whether you work more or less compared to work before the Covid-19 pandemic, what are some of the main problems employees face while working from home, as well as whether the employer has provided them with adequate equipment for working from home, motivation and support due to the new situation (Covid-19). The following graphic display refers to the percentage display of different forms of flexible work arrangements according to the Cranet methodology, as well as a comparison of the level of application of remote work before, during, and after the Covid-19 pandemic.

Figure 1. Presentation of the average level of application of different types of flexible work arrangements according to the Cranet research methodology

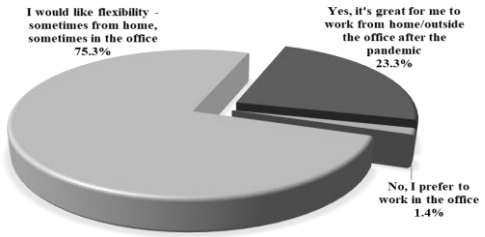


Source: Authors of research

Figure 1. shows the average level of application of various forms of flexible work arrangements according to the Cranet research methodology, if we compare all levels except remote work, it can be concluded that flexi-time (4.47) records the highest level of application, followed by over time (3.16), temporary job (2.81), part-time job (2.71), weekend work (2.58), while shift work (2.36) records the lowest level of application. By comparing remote work before, during and after the Covid-19 pandemic, it can be concluded that the highest average level of application was recorded during the Covid-19 pandemic (4.77), followed by a slightly lower level of use after the Covid-19 pandemic (4.34), while the lowest level of use was recorded before the Covid-19 pandemic. 19 pandemic (2.34), which indicates that companies saw the effects and importance of this way of doing business due to the great impact of the health crisis and that they decided to keep this way of working to a greater extent than before after the COVID-19 pandemic.

Wickramasinghe & Jayabandu (2007) investigated the perceptions of professional employees in the IT sector, about flexible work arrangements and the creation of an appropriate professional environment for them. The results indicated that the level of satisfaction with flexible working hours is high and also indicate that employees have managed to develop work patterns that allow them to combine business and personal life commitments, while employers reap the benefits of gaining employee commitment, and loyalty and maximizing employee potential. The results of the research by Błaszczyk et al. (2022) indicated that the Covid-19 pandemic has significantly changed the pattern of work in the IT sector in Poland. Before the COVID-19 pandemic, 82% of employees worked in stationary or hybrid conditions, with stationary mode of work prevailing. The pandemic has influenced as many as 74% of employees to change their way of working and to switch to remote work or a hybrid way of working, whereby remote work still prevails. The findings of the authors Błaszczyk et al. (2023) point to a significant change in business models, within which most companies have completely adopted remote work as a dominant way of working. However, managers generally perceive remote work as a worse outcome compared to stationary work. Major concerns about telecommuting relate to the difficulty of monitoring, and maintaining effective team communication, and the potential negative effects on employee motivation and well-being due to limited interaction. However, they say that the main advantages of remote work are flexibility, talent attraction, and compliance with the requirements of employees and the labor market.

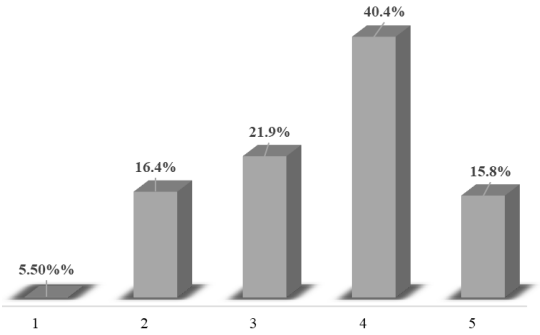
Figure 2. Percentage of answers to the question "Would you like to work outside the office even after the Covid-19 pandemic?"



Source: Authors of research

Based on the presented Figure 2. the results indicated that the largest percentage of respondents would like to have flexibility, sometimes to work from home and sometimes in the company's office (75.3%), then, yes, they would like to work from home, outside the office after Covid-19 pandemic (23.3%) while 1.4% of them answered that they would like to work in the company's office and not from home after the pandemic.

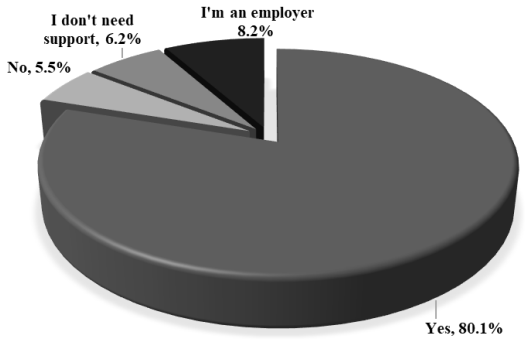
Figure 3. Percentage of answers to the question "How many days a week would you like to work outside the office after the Covid-19 pandemic?"



Source: Authors of research

Based on the results shown, it is evident that the largest number of employees would like to work 4 days outside the office after the Covid-19 pandemic, as much as 40.4%, a slightly smaller percentage indicated 3 days (21.8%), 2 (16.4%), 5 (15.8%), while the smallest number of them marked 1 day (5.5%). De Klerk, Joubert & Mosca (2021) emphasize that the ideal ratio of remote work and office work is about 2-3 days a week and that adequate support for employees should be established.

Figure 4. Percentage of answers to the question "Did your employer provide you with the necessary motivation and support in adapting to the new situation related to the COVID-19 pandemic?"

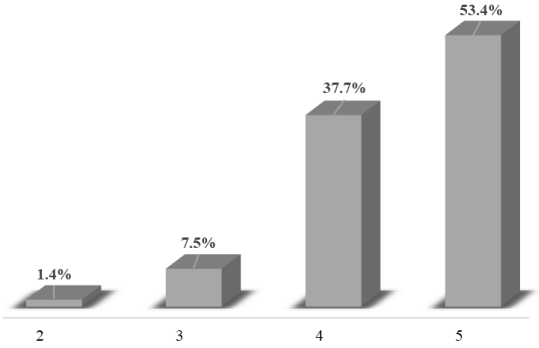


Source: Authors of research

According to the above, as the authors De Klerk, Joubert & Mosca (2021) pointed out it is necessary to provide employees who use different forms of flexible work arrangements with the necessary motivation for work, the results of our research shown in Figure 4 indicate that the 80.1 % of employees responded that the sender

provided them with the necessary motivation and support in adapting to the new situation related to the Covid-19 pandemic. Hill, Ferris & Martinson (2003) emphasize that the implementation of flexible work arrangements such as working from home and flexible working hours, positively affects the trust of the organization among employees, which positively reflects on morale and motivation (Weideman & Hofmeyr, 2020). Chen & Fulmer (2017) support the above and emphasize that employees who work remotely may not always be satisfied with their work, but the trust given to them has a positive effect on the motivation of employees to work harder as a sign of gratitude for the trust instilled in them. Employee motivation is a set of factors that influence the desire, ability, and intention of employees to achieve the defined goals of the organization and includes internal and external factors that encourage the individual to engage a certain level of energy, time, and resources to achieve results in their work (Liaquat et al., 2024).

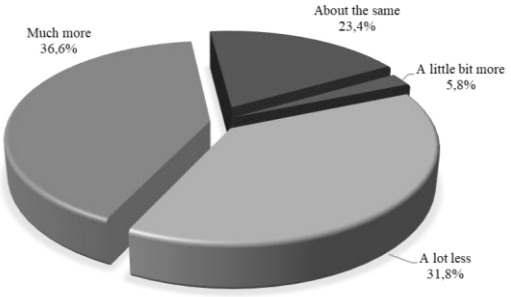
Figure 5. Percentage of answers to the question "How do you rate the productivity of working from home compared to the productivity of working from the office on a scale of 1 to 5?"



Source: Authors of research

Based on the results shown in Figure 5, the largest percentage of respondents marked that productivity from home is at a high level (grade 5, 53.4%), followed by 4 (37.7%), 3 (7.5%), while the smallest number of them marked 2 (1.4%). Gibbs, Mengel & Siemroth (2021) used staffing and analytics data from over 10,000 qualified professionals in a large Asian IT company, where they compared the productivity of working from home before and during the period of the COVID-19 pandemic. The results indicated that total hours worked increased by approximately 30%, including an 18% increase in after-hours work while average production did not change significantly. Productivity fell by about 20%, while time spent on coordination activities and meetings increased, but continuous working time was significantly reduced. Employees spent less time networking and had less coaching and 1:1 meetings with supervisors. Employees with children worked more than those without children and suffered a significant drop in productivity compared to those without children. Haridas, Rahul & Subha (2021) on a sample of 115 employees in the IT sector in India who work from home, found that communication and collaboration have the greatest impact on employee productivity when they work from home. They suggest that employers and managers must find adequate ways to improve communication with and between employees.

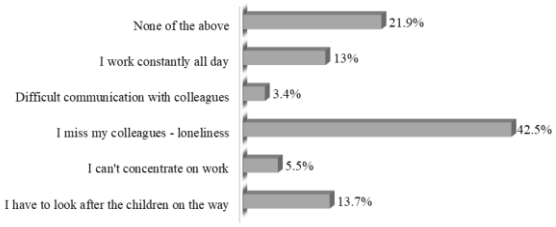
Figure 6. Percentage of answers to the question "Do you work more or less compared to work before the Covid-19 pandemic?"



Source: Authors of research

Based on Figure 6, it can be seen that the answers are divided, the largest number of them answered much more (36.6%), followed by a lot less (31.8%), about the same (23.4%), while the least number of them answered a little bit more (5.8%).

Figure 7. Percentage of answers to the question "What problems do you encounter while working from home?"

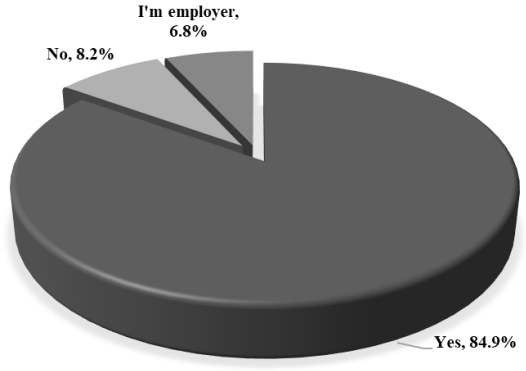


Source: Authors of research

The biggest problem that the respondents pointed out is that they lack colleagues, more precisely, that they feel lonely (42.5%), followed by none of the above (21.9%), which is a good indicator, the employees emphasize that they do not have any problems and that this way of working suits them"). Ipsen (2021) points out that the biggest disadvantages of working from home are the loneliness of employees due to social distance,

maintaining the balance between work and private life, etc. Yahoo!, Bank of America, and IBM have decided to bring remote workers back into the office to foster social relationships and foster creativity (Spector 2019). Khazanchi et al. (2018) emphasize that these organizations found that many employees preferred to work remotely rather than in the company office, which they saw as a threat to collaboration and morale. For certain employees, the office can indeed be a major source of stress. In their eyes, virtual offices can be a way to "escape" the office and alleviate the emotional exhaustion caused by social interaction (Stich, 2020).

Figure 8. Percentage of answers to the question "Do you think that your employer provided you with the necessary work equipment?"



Source: Authors of research

Based on the results shown in Figure 8, the largest number of respondents indicated that their employer provided them with the necessary work equipment (84.9%), then that they did not provide them with equipment (8.2%), while 6.8% indicated that they were employers. Work equipment is one of the necessary resources that enable employees to perform their work activities, especially in the IT sector. The development of IT technologies and digitization of business are increasing and the recommendation to companies is to provide adequate equipment so that the efficiency of business activities is as high as possible, and employees are satisfied.

CONCLUSION

Research on the topic of perceptions of millennials on the practice of flexible work arrangements in the Serbian IT sector indicates significant conclusions from a sample of 146 respondents, first of all, it was established that flexi-time is the most widely used in comparison to other forms of flexible work arrangements, unless we compare remote work before, during and after the Covid-19 pandemic where the level of application of remote work during the Covid-19 pandemic records a significant level of application. By comparing remote work before, during, and after the COVID-19 pandemic, the highest level of application was recorded during the COVID-19 pandemic, which indicates that due to the significant health crisis, companies have found a way to reduce the negative effects. A good indicator can be observed in the sense that the level of application of remote work after the Covid-19 pandemic is significant, slightly lower compared to during but significantly higher than before, which indicates that companies have maintained this way of doing business because they saw that in their in crisis situations like the one mentioned, this way of working showed well and that the employees were satisfied. By analyzing the other questions, it was determined that employees would like flexibility in their work, in the sense that sometimes they work from home and sometimes in the company's office, and that they would like to work four or three days outside the office. Millennials in the private IT sector rated their productivity high when working from home, but opinion is divided as to whether they are working more or less from home than before the COVID-19 pandemic. When asked whether the employer provided them with the necessary equipment for work as well as support and motivation due to the COVID-19 pandemic, the employees answered positively. On the questions related to the disadvantages of remote work, social distance was highlighted in the largest percentage, or more precisely, the loneliness that resulted from the success of remote work. Considering that the Y generation is at such an age where a good part of the employees have children, there are a lot of answers that when working from home, they have to take care of the children. There is also a problem where employees report that they work all day, have difficulty communicating with colleagues, and that they cannot concentrate on work, but in a smaller percentage. They would also emphasize that a good part of the respondents answered that nothing bothers them while working from home, even 21.9%, which is a positive indicator, in the sense that the employees are satisfied with this way of working and would continue to do business this way.

By searching scientific works on this topic, the results were confirmed, so De Klerk, Joubert & Mosca (2021) emphasize that the ideal ratio of remote work and office work is about 2-3 days a week and that adequate support for employees should be established. Hill, Ferris & Martinson (2003) emphasize that the implementation of flexible work arrangements such as working from home and flexible working hours, positively affects the trust of the organization among

employees, which positively reflects on morale and motivation (Weideman & Hofmeyr, 2020). Chen & Fulmer (2017) emphasize that trust given to them has a positive effect on the motivation of employees to work harder as a sign of gratitude for the trust instilled in them. Rahul & Subha (2021) found that communication and collaboration have the greatest impact on employee productivity when they work from home. Ipsen (2021) points out that the biggest disadvantages of working from home are the loneliness of employees due to social distance, maintaining the balance between work and private life, etc. Khazanchi et al. (2018) emphasize that these organizations found that many employees preferred to work remotely rather than in the company office, which they saw as a threat to collaboration and morale.

IT organizations should, by the various challenges they face, develop strategic programs as well as instructions for the implementation of various forms of flexible work arrangements, and they would especially emphasize remote work, work from home, and the use of flexible-teams, which records the highest level of application in this sector. The goal of an adequate strategy and implementation is to positively influence the working attitudes and behaviors of employees, as well as to eliminate the negative effects that may occur when applying this way of working, such as a disbalance between work and private life, loneliness, reduced concentration, reduced stress, etc. Some recommendations for managers in the private IT sector who use flexible work arrangements and want to effectively manage teams are primarily to set clear expectations (clear communication regarding expectations is necessary, all team members must know what is expected of them), the focus should be on efficiency through various forms of flexible work arrangements rather than on the number of hours worked, it is necessary to provide adequate resources such as access to technologies and resources necessary for remote work such as reliable internet connection and collaboration tools. Ensure regular communication with team members through various communication channels and foster a culture of open communication where all team members should feel comfortable sharing information and ideas. Implement appropriate systems for coordinating progress and evaluating performance based on long-term goals and provide feedback and support to help the team succeed. Promote a balance between work and personal life by encouraging team members to take breaks, set boundaries between work and personal life, and prioritize self-care. By implementing these recommendations, managers can effectively lead teams in a flexible work environment while promoting efficiency, productivity, and positive effects on work attitudes, and behaviors among team members.

Some of the main limitations of the research are focused on the number of employees, which should be higher to be more relevant, and conducting interviews with managers and other employees about more detailed information regarding the implementation of various forms of flexible work arrangements to uncover some new details.

Recommendations for future research refer to a larger number of respondents, conducting live interviews, as well as analyzing different effects such as the impact of flexible work arrangements on the establishment of work-life balance, job stress, work attitudes (employee engagement, job satisfaction, employee commitment, turnover intention, etc.), employee behavior (innovative work behavior, employee performance).

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SOFTWARE FOR MONITORING HAM PRODUCTION

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***Abstract**: Technological progress brings revolutionary changes to people's everyday lives. Already today, the worldwide issue of food scarcity and the challenge of monitoring the quality of consumed food are present. New technologies provide traceability management for food from primary production to the finished product.*

Through this paper, we aim to showcase that we also have experts successfully addressing this issue. The paper describes a practical solution for tracking the entire production chain of ham, developed by our specialists for the needs of an Italian company. This company produces indigenous products with geographical indication protection. This solution was implemented as part of the Horizon 2020 project, funded by the European Union.

The foundation for our practical ham production tracking solution lies in the development of Industry 4.0, artificial intelligence, Web 3.0, semantic web, robotics, blockchain, IoT, Beacon, RFID, and similar technologies.

First, the traditional method of ham production is described before the use of modern information technologies. Then, the paper outlines the functioning of the program for tracking ham production, starting from pig slaughtering to the distribution of finished products in shops.

The main advantage of the presented system is information tracking. Since the RFID tag preserves product information throughout the supply chain, in case of a food safety incident, faulty products can be immediately located. The causes of errors, locations, and responsible personnel can be detected and proven through a web 3.0 application based on the OriginTrail blockchain protocol. This could significantly reduce business losses. Transparency of product information could significantly increase consumer trust in products and as a result boost their confidence in the food market.

***Key words**: ham, traceability, production, software, food supply chain, OriginTrail, blockchain*

JEL classification: O33

1. INTRODUCTION

In today's world, people enjoy all the conveniences brought about by the progress of science and technology. Technological advancement is ushering in revolutionary changes in people's daily lives. The increasing need for efficient resource management, safety, and comfort has led technologically advanced companies to integrate innovations that facilitate everyday tasks.

Currently, there is a global issue of food scarcity and a challenge in controlling the quality of the food people consume. Therefore, various research efforts are underway to ensure the traceability management of food from primary production to the finished product. The development of information technologies and artificial intelligence has enabled a large number of researchers worldwide to address this issue.

The European Commission has defined this problem as the "ability to trace and track food, feed, food-producing animals, or substances intended to be, or expected to be, incorporated into food or feed, throughout all stages of production, processing, and distribution." The European Union financially supports projects dealing with food production quality control through various funds.

Through this paper, we aim to showcase that we also have experts successfully addressing this issue. The paper describes a practical solution for tracking the entire production chain of ham, developed by our specialists for the needs of an Italian company. This company produces indigenous products with geographical indication protection. This solution was implemented as part of the Horizon 2020 project, funded by the European Union.

The foundation for our practical ham production tracking solution lies in the development of Industry 4.0, artificial intelligence, Web 3.0, semantic web, robotics, blockchain, IoT, Beacon, RFID, and similar technologies.
Through this paper, we seek to confirm the main hypothesis that information technologies can provide automation and optimization of various processes in food production, leading to increased efficiency and reduced production costs.

2. LITERATURE REVIEW

Over the past decade, there has been an increase in the professional and scientific literature addressing technologies that enable tracking all processes from food production and distribution to consumption.

There is a long history of research related to agriculture, food networks, and the entire food supply chain. As early as 1998, Felne investigated the traceability of beef in supply chains in the United Kingdom.
Global supply chain traceability has become an increasingly important issue in recent years, with calls for greater control and transparency, as highlighted by Steven in his work. Ensuring traceability in the food supply chain represents a significant advantage for companies in terms of quality control, product safety, product recall tracking, and optimization of reverse logistics processes.

In 2019, Pal et al. stated that combining blockchain technology with automated IoT sensors, artificial intelligence, and industrial robotics would make the system more robust and reliable.
Several companies have started using IoT sensors to ensure food traceability. For instance, Shanghai ZhongAn places sensors on chickens to record their location and daily movements.

The use of blockchain to enhance the safety and quality of agricultural and food products was considered by Xu and colleagues in their work, focusing on four aspects: improving data transparency, achieving data traceability, enhancing food safety and quality tracking, and reducing financial transaction costs. The study includes a case study on Walmart, demonstrating how blockchain can be used to improve food traceability and quality.
Unfortunately, today there are food products on the market for which it is not possible to ascertain health safety, geographical origin, or even the production date with certainty. Food producers and distributors worldwide are under pressure from governments, consumers, non-governmental organizations, and other stakeholders to disclose sufficient information to citizens about the origin of their products, composition, and production conditions. Traceability of food using modern information technologies, including temperature regulation during transport and storage, and more precise tracking, better quality control, safety, and supply chain process optimization, significantly lead to cost reduction, especially in the case of product recalls. In recent times, internet scams targeting users of e-commerce platforms have intensified. This type of fraud is directed at individuals looking to sell their products online. Katanic and colleagues in 2022 emphasized the need to educate people selling products online about the significant risks they may face if they are not cautious and readily provide their personal information to unverified individuals.

Yadava and colleagues in 2022 presented a systematic literature review on Industry 4.0 specifically in the agri-food supply chain. In their work, they noted that the need for Industry 4.0 is felt throughout the entire agriculture food supply chain to address global demand for food products and concerns about food safety. They highlighted that this industry transformation is made possible by recent technological advancements, including the Internet of Things, Blockchain, Big Data, Information and Communication Technology, Cloud Computing, and Cyber-Physical System. Each of these technologies can make the system smart enough to meet today's global challenges. The paper provides a detailed overview of the main technologies, aiming to understand their applications and emerging trends.

In study 2024 Wang and and colleagues presented how the digital transformation of food supply chains can be achieved by adopting key technologies such as the Internet of Things, cloud computing, and Big Data Analytics. Basic goals and principles for digitally transforming food supply chains are identified for the initial stage of development in this economic branch. A four-layer technology implementation structure is developed for the implementation phase, development software for food supply chains digital transformation. This paper contributes to the development of theory on digital transformation in food supply chains and offers more instructions for accelerating the growth of the food industry using key Industry 4.0 emerging technologies. The study highlights the need for a balanced integration of Internet of Things, cloud computing, and Big Data Analytics as key Industry 4.0 technologies to achieve digital transformation successfully.

3. DEVELOPMENT OF A PROGRAM FOR TRACKING HAM PRODUCTION

The process of ham production in an Italian company traditionally unfolds as follows before the implementation of our software solution for achieving complete traceability in the food supply chain:

1) Receipt of fresh ham thighs, processing, and salting. Salted hams are placed in Chamber 1 for aging (7 days, 0 ^{o}C to 4 ^{o}C, on a plastic platform shelf).
2) Second additional salting of the ham. Salted hams go then to Chamber 2 for aging (15 days, 0 ^{o}C to 4 ^{o}C, on a plastic platform shelf).
3) Removal of salt, tying a string around the ham, removal from the plastic shelf, and placement on a metal shelf. Hams go to Chamber 3 for aging (15 days, 0 ^{o}C to 4 ^{o}C, metal shelf).
4) Cleaning mold around the ham bone. Hams go to Chamber 4 for additional aging (80 days, 1 ^{o}C to 6 ^{o}C metal shelf).
5) Machine washing of the entire ham and drying. Hams go to Chamber 5 for aging (7 days 16 ^{o}C to 18 ^{o}C, metal shelf).
6) Pre-curing stage of ham. Hams go to Chamber 6 for aging (90 days, 16 ^{o}C to 19 ^{o}C, metal shelf).
7) Greasing the ham with lard. Hams are divided by size and placed on another metal shelf.
8) Proces final curing of the ham. Hams go to Chamber 7 for aging (until the ham is ready for sale, 16 ^{o}C to 19 ^{o}C, metal shelf).

Each pig, intended for ham production, is tattooed on the thighs at the farm. This identification number remains visible throughout the entire drying and curing process. The initial traceability level occurs at the slaughterhouse, where all fresh thighs for ham production originate. During the slaughtering process, the slaughterhouse tattoos its slaughter LOT number, which remains visible throughout the drying and curing process.
When the meat is received at the ham factory, a metal ring with the date of receipt (beginning of processing) is placed on each leg. Additionally, a paper containing information about the LOT and the date of the first salting is placed on each platform. This paper accompanies the platform throughout the "PigLard" process, where pork fat is applied to the ham during ham production. After this process, the hams are removed, redistributed on racks based on size, and the final curing process begins.
Throughout the curing process (after one year), representatives of the consortium, if the ham meets quality requirements, tattoo the crown and the hamery code. This designates the product as of authentic origin and of specific quality.

In the described process, there was no digitalization. Traceability is lost during ham production in the "Pig Lard" process because the papers with information about the receipt of fresh meat (thighs) and the salting date are removed from the platforms at that stage.

To achieve complete and automated traceability in ham production, the following levels of digitalization need to be implemented:

1) Software for receipt input-output
2) RFID tags on hams (fresh thighs from the slaughterhouse)
3) RFID for platform racks (pre-curing process)
4) Software for ham greasing (pig lard – greasing process) with IoT scales for reading RFID tags on hams
5) Beacons and RFID in the curing process
6) Photo module
7) Beacon/Agv for automatic inventory of ham status
8) Data logger (information on destination and transport conditions)
9) Blockchain/ OriginTrail.

These processes involve the implementation of digitalization within the real production process through the development of an ERP production system architecture and its integration with IoT sensors such as RFID, NFC, Beacon tags, and Data Loggers, along with the use of robotics such as AGV vehicles and robotic arms. This is done to achieve automatic and timely reading and

collection of traceability information, which the ERP system should automatically send to a WEB3.0 developed application based on the OriginTrail (blockchain) protocol.

3.1. DATA ENTRY SOFTWARE

The software for entering the reception of fresh thighs represents the first step towards digitalization in achieving complete traceability within the production process. Introducing an ERP system enables the linking of the ham reception LOT number at the factory with previous traceability data for each ham, as well as the later creation of work orders in the process of dispatching finished products. Each line within the reception document represents one LOT number from that slaughterhouse. In ham production from the slaughterhouse, reception notes arrive with multiple slaughter LOT numbers for the delivered hams, containing data about their breeder, tattoo numbers, slaughterhouse, transporter, and similar information. In the first stage of digitalization, the data from the reception document is entered into the ERP software by office employees.

The output of finished products into the supply chain also occurs through ERP software in the following steps:

1) Office employees create a work order for production, specifying how many hams to pack for exit from the factory.
2) Employees in the ham dispatch department receive the work order, where they can see the required hams according to aging and customer.
3) Employees in the dispatch process pack the hams and record how many hams with the LOT number they have packed.
4) Finally, dispatch employees enter this data into the ERP software.

In the first step of digitalization when only an information system was introduced (without RFID technology), the primary drawback was that after a production process lasting 2 years, the worker in the dispatch department often could not clearly see the tattoo numbers on the hams, nor could they see the breeder (farm) numbers. What was visible was the LOT reception number. As a result, when traceability was displayed, the LOT reception number of the ham being sold was linked to the dispatch. Consequently, it was sometimes impossible to accurately identify the slaughterhouse from which the ham originated, as well as the farm from which the ham further entered the supply chain.

3.2. PLACEMENT OF RFID TAGS ON FRESH MEAT FROM SLAUGHTERHOUSE

The placement of RFID tags on fresh meat - thighs that arrive for ham production from the slaughterhouse is carried out as follows:

1) Office employees, based on the reception document from the consortium website, know the number of thighs arriving from the slaughterhouse on that day.
2) Office employees take the necessary number of RFID tags from the warehouse.
3) Office employees take an RFID terminal reader, scan the required number of RFID tags, and link them to the current LOT reception number - all this data is automatically entered into the ERP software.
4) Office employees send the previously read and linked tags to employees in production.
5) Production employees place RFID tags on the incoming fresh thighs. The production worker has nothing to do with the software. They only physically place the tags on the hams.

Reading of hams at the dispatch, the outgoing process of finished products from the ham factory, based on the described process, would proceed as follows:

1) Office employees create a production work order - indicating how many hams need to be packed for dispatch.
2) Employees in the dispatch process retrieve the work order, which specifies the required hams according to their aging and the customer.
3) Employees in the dispatch process read the RFID tags on the hams by passing them near an RFID antenna reader, which automatically communicates with the ERP software. They then pack the hams into plastic boxes for dispatch. The software automatically knows the quantity of hams and from which LOT reception number they were packed by the worker.

By tagging hams with RFID tags, we can track each ham by its LOT reception number. In terms of traceability, we can confidently determine that the hams come from a specific pig breeder, slaughterhouse, identify the meat carrier, and obtain a range of other data related to the production process.

3.3. PLACING HAMS ON SHELVES FOR CURING

The process of placing hams on curing shelves is carried out automatically using a robotic arm and RFID reader. Hams already have RFID tags on them, which uniquely identify them. The goal is to

track hams even on the platform racks. Each platform rack has its own RFID tag attached to it. When the platform rack approaches the robotic arm, the RFID tag on the platform rack is scanned, and the information is recorded in the database.

Hams with RFID tags from previous production processes pass through the salting machine. At the end of the salting line, there is a robotic arm. The robotic arm picks up 3 hams at a time and transfers them to the appropriate shelving rack. To associate the hams with the shelving rack, we can place an RFID tag on the top of each platform rack, which is pulled through the factory by the conveyor system. Additionally, an antenna is installed on the conveyor system for the racks and another antenna is placed above the salting line to read the hams.

In the continuation of the production process, the next platform rack, which will be filled with hams, approaches the robotic arm. When the platform rack approaches the robotic arm, the RFID antenna will read the RFID tag of this rack, and the information about which platform rack is currently being used for placing hams by the robotic arm will be automatically sent to the ERP software.

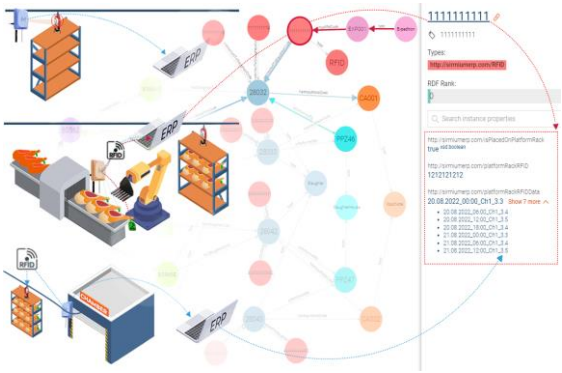

Figure 1. The robotic arm moves the hams
Source: Authors

After this, the robotic arm moves the hams from the salting line to the platform rack, which is then carried by the transport system, as in Figure 1. This figure also depicts a part of the knowledge graph with nodes and connections between the data. The graph knowledge graph allows for easy tracking of the data origin, connections between the data, and their storage in the database. In front of each chamber for fresh meat (hams), an RFID antenna can be placed next to the transport system, where the platform racks pass. This way, it is known when a platform rack (with all connected hams) enters or exits a chamber. This enables us to automatically know within the ERP system where each ham is located.

3.4. SOFTWARE FOR PIG LARD

The next step in ham production involves applying pig lard to the hams and separating them into large and small ones. To perform this task, an IoT scale is required, which automatically for each ham:

- Read (RFID)
- Measures the weight
- Inputs size division (large, small)
- Automatically records the date, measurement.

All this data is sent to the ERP software by the IoT scale. Employees in the process of greasing the hams with lard remove the ham from the pre-curing shelf and place it in front of the antenna - RFID reader. The RFID reader reads the RFID from the ham and automatically sends information to the ERP software that the ham has entered the gresasing process with lard. Employees in the process of greasing the hams with lard place the ham on the IoT scale. The scale automatically sends the measured weight of the ham to the ERP software, which is then linked to the last read RFID of the ham. Also, based on the weight received from the scale, the ERP software labels the hams as LARGE – SMALL, as illustrated in Figure 2. Employees apply lard to the ham and place them on the shelf. Large hams will be placed on one shelf, and small hams on another, as they have different curing times. In this way, a person is prevented from making a mistake when sorting the hams, because this later directly affects the uneven ripening time of the hams.

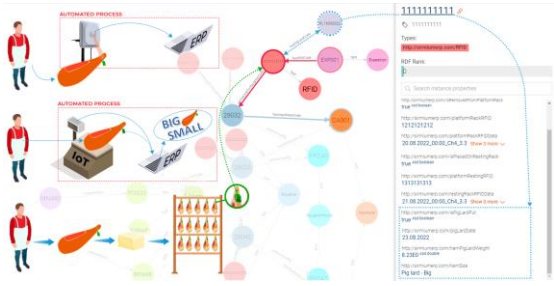

Figure 2. Weighing and Sorting of Hams
Source: Authors

3.5. BEACONS AND RFID IN CURING PROCESS AND INVENTORY PROCESS

The ham curing process occurs after the previous pig lard process, where sorted hams are placed on wooden racks, initiating a new curing process that lasts for one year. The digitalization of this process aims to achieve traceability of each ham.

An RFID tag is placed on each curing rack. When an employee fills a rack with hams during the greasing process, they can use an RFID reader to scan the RFID tag on the rack and then scan all RFID tags on each ham on the rack. The ERP software will automatically link the RFID tag to all the information for each ham. After this step, based on the entered data, we can determine when the ham entered the curing process, on which rack it is located precisely, and from which rack it entered this process.

The employee responsible for quality control and photographing the products will take a phone with a developed mobile application. First, they will scan the RFID on the rack and then take a picture of the hams. This way, the picture is linked to specific hams. A report can be generated with all the photos of the racks containing hams in all stages of production. These images can be uploaded to the blockchain. This enhances the digital identity of the ham and provides evidence of its quality and that the hams of that LOT number have undergone key production processes.

Inventory of hams could be conducted in two ways. The first method involves beacon antennas placed around the curing chamber. This way, we can have the position of each rack and each ham in real-time within the ERP software. The second method involves AGV vehicles (Automated Guided Vehicles), which would have an integrated RFID reader, as shown in Figure 3. Passing through the warehouse, next to the racks with hams, the AGV could automatically read the RFID tag of the rack and the RFID tags of the hams. This confirms that the ham is in stock in the warehouse. This ensures traceability, and we can have information about where the ham was located and when it was moved exactly on a daily basis if the inventory is conducted at the end of each workday.

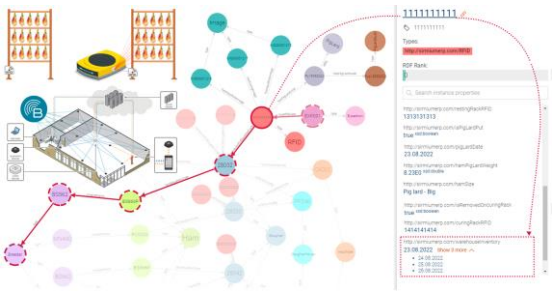

Figure 3. Inventory of Hams with AGV Vehicle
Source: Authors

The primary advantages of this automatic ham tracking system are:

- Real-time location tracking of hams during curing.
- Real-time location tracking of reserved hams.
- Real-time location tracking of hams ready for shipment.

3.6. TRANSPORT TRACKING WITH DATA LOGGER

After the ham dispatch process from the factory, we can track the products during their transportation using a data logger. The data logger collects information about transportation conditions such as GPS coordinates, destinations, truck routes, humidity, and temperature of the cargo area, and automatically sends this data to the ERP software where it can be further monitored in real-time. The digitization of this process unfolds as follows: Employees involved in the ham dispatch process connect the data logger to the shipment's LOT number via a mobile application. Then, the data logger is placed inside the shipping box along with the hams for transport. During dispatch, employees scan the hams by passing them near an RFID antenna reader while placing them into the box. The ERP software automatically associates the hams with the data logger. The data logger sends transportation data, destination (GPS coordinates), temperature, humidity, and other information to the ERP software. This way, data about the hams is tracked by the data logger after the dispatch process as they leave the factory and during their distribution in the supply chain. This ensures complete product tracking from the factory to the point of sale.

The main operational advantage of this digitization process is obtaining information about the final products when they leave the factory.

The main business-to-business (B2B) advantage of this digitization process is tracking products from the factory to their destination.

The main business-to-customer (B2C) advantage of this digitization process is tracking items from the factory to the store.

3.7. BLOCKCHAIN ORIGIN TRAIL APPLICATION

The Origin Trail blockchain technology doesn't enable us to detect errors starting from the production process all the way to the ham selling process. We use it only to decentralize and irrevocably store all relevant data that we previously collected during the production process via IoT technology, with complete certainty in the immutability of these stored data. It allows us to know with certainty that no one can alter or influence the stored data or recorded transactions found in the blockchain. Figure 4 depicts a

scheme describing the connection between the technologies used in the process of tracking ham from production to sale.

The operational OriginTrail blockchain application is developed with the aim of inputting production data necessary for traceability into the blockchain. In the background of this web application, data for signing is received by ERP software. After the operational application signs these data, it sends them to the blockchain/Origin Trail. In response, the OriginTrail network returns recorded transactions to the operational web application. This application is designed as a middleware independent service to which the ERP distributed information system sends data for signing so that it can record them in the blockchain. This service utilizes an authorized worker to verify (record in the blockchain) the data of the described key processes in ham production, which are created by the ERP software. When the authorized user signs or records the data with this application, the data remain permanently recorded in the blockchain. Within the application, alongside the main menu for recording incoming data, a history of recorded transactions is implemented, enabling searching for each transaction recorded in the blockchain. By using this method to communicate with the blockchain, there is no need to change the existing ERP software and its logic in production. Additionally, through this application, the manufacturer can verify or recall products by searching for each specific ham that is permanently recorded in the blockchain.

The second application retrieves production traceability data from the blockchain/OriginTrail knowledge graph. This is a business-to-business (B2B) application. It contains detailed information related to the ham production process so that the business partner can ensure the quality of the product and the production process, confirming that it is indeed what they are purchasing. This mobile application is developed for complete product traceability. It is used by business partners and is designed to provide full control over the production process to ensure the quality of purchased products. In this mobile application, all data from the blockchain about specific hams can be seen in detail. The data that can be viewed include whether the product is authentic, which farm it comes from, the tattoo number of the animal, which slaughterhouse processed it, in which LOT it belongs, the processes the ham went through, the duration of aging, the temperatures in which it was stored in warehouses, the conditions of transportation including GPS coordinates of its movement during transportation, and temperatures, along with photographs of the hams at each stage of the process.

The third application, business-to-customer (B2C), is developed for end customers. Compared to the previous B2B application, this application contains much less traceability information and does not include individual photographs of each production process. Not all processes and other unnecessary information for the end-user are displayed. The data presented in this application include the breeder, slaughterhouse, receipt, aging, and dispatch. For example, a customer in a shop scans the QR code on the ham and receives key traceability information about the scanned product on their phone using augmented reality. The QR code contains the ham code from the blockchain, through which data on key processes are pulled from the knowledge graph on the OriginTrail network. These data are then displayed to the user in the mobile application on their phone.

In this way, the customer can get a lot of new information about the product he is buying. Today's customers have become increasingly demanding, and those producers who in the future will provide customers with additional data on the process of producing food products will be much more recognizable on the market. This kind of news and data spreads quickly and easily on social networks, and it also becomes a new channel for advertising products.

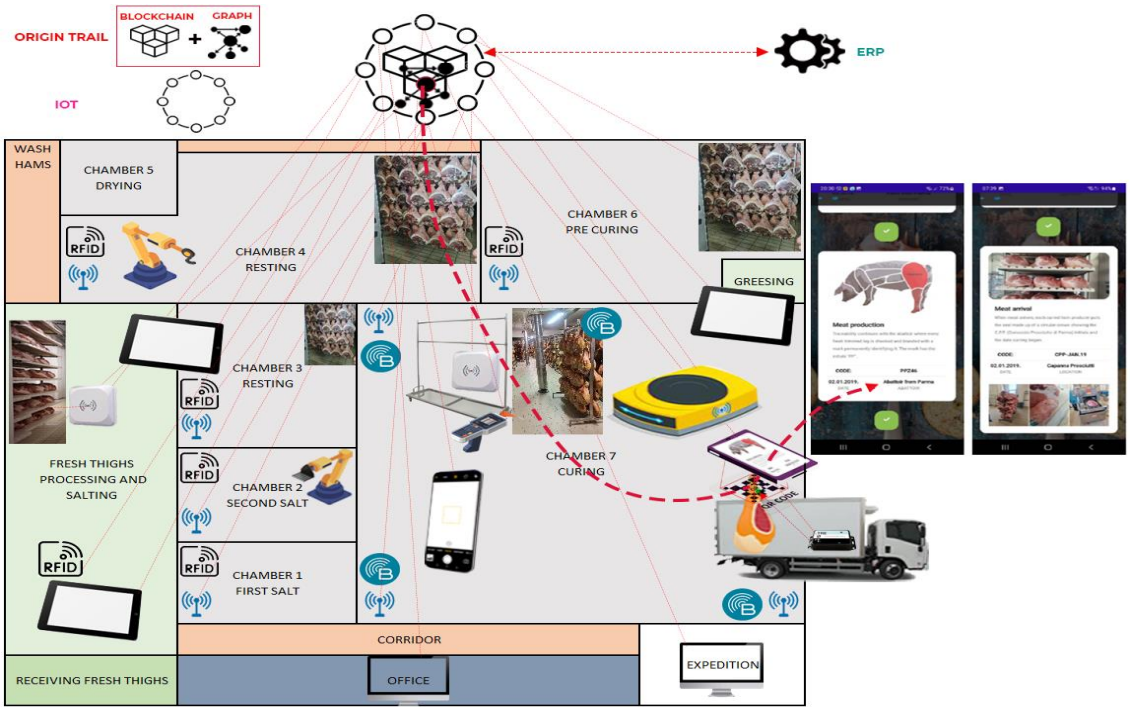

Figure 4. Schema of technologies used in tracking the production and sale of hams
Source: Authors

CONCLUSION

The transparency deficiency in meat supply chains is a significant problem, as evidenced by crises and scandals related to meat products. Implementing a system that ensures meat traceability is challenging due to complex dynamic factors and intricate production processes inherent in today's global business environment.

The primary problem addressed by blockchain technology is how we can establish a consensus foundation for secure transactions without worrying about unauthorized data access. Blockchain can guarantee the security of the entire network using a mathematical algorithm mechanism. Thanks to blockchain, all elements in the system can autonomously and securely exchange their data.

We have implemented a ERP system in an Italian company that is one of the leading producers of ham, as part of the Horizon 2020 project, funded by the European Union. This softwe for complete digital traceability in real food production. This software provides tracking and display of a large amount of data in a real food production environment with regards to the presentation of modern and necessary technologies.

The developed transparency system enables all stakeholders throughout the food chain to manage data within their facilities and share information with external operators and interested parties. Achieving true traceability of meat products critically depends on a transparency system that involves data sharing among key actors in the supply chain, thus achieving external transparency. Without appropriate external and internal transparency systems, the desired transparency of meat products cannot be achieved. By utilizing IoT, RFID, and Beacon technologies, minimal human intervention in gathering information for the demonstrated real production system has been achieved. The implemented system relies on the OriginTrail blockchain and has enabled all product information in the supply chain to be transparent and open. Real-time product tracking has been made possible. Regulatory authorities could manage traceability and conduct accountability investigations for faulty products. Consumers can obtain information about products throughout the supply chain. Wholesale buyers can have more information about the quality of products and the production process of all lots within production. This enables a useful system for establishing a healthier and more business-correct environment.

The benefits of a digitized traceability system are manifold. One of the main advantages is protecting the product from counterfeiting, which is particularly important for expensive and original products to protect their geographical origin. In terms of data tracking, the system requires minimal manual operations, greatly reducing errors caused by human factors. Furthermore, by utilizing blockchain technology, all members of this system are unable to

manipulate information, further increasing product security and quality. The system can be applied to track product expiration dates. Therefore, a seller could replace these food products if they have expired or reduce the price before the product's expiration date. We believe that artificial intelligence will increasingly take over a large amount of data from such or similar systems in the future. Artificial intelligence will be increasingly used by both food producers and consumers to quickly find answers to their questions daily.

Finally, the RFID and Beacon system can also be beneficial for verifying storage temperature information, including tracking temperature and humidity. This could be helpful in avoiding food safety issues.

The greatest advantage of the demonstrated system is precisely the tracking of information. Since the RFID tag preserves product information throughout the supply chain, when a food safety incident occurs, faulty products can be immediately located. The reasons for errors, their location, and responsible personnel can be identified and proven using the OriginTrail blockchain system. This could significantly reduce business losses. Transparency of product information could greatly increase consumer trust in products and obviously enhance their trust in food markets.

With minor adjustments, the demonstrated system could also be applied in the production of wine, cheese, and other food products for which ensuring traceability from production to the end consumer is essential. This software can be used to monitor the food production process in all cases where we wants to protect production from illegal copying of products, that is, one wants to ensure the protection of the geographical origin of food.

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Original Article

SOCIAL ENTREPRENEURSHIP IN THE SERVICE OF ECONOMIC AND SOCIAL DEVELOPMENT

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***Abstract**: The era of technological development brings great challenges. The economy has never been more developed, but there have also never been more marginalized groups in society. This refers to people with special needs (certain disabilities), convalescents, elderly people, women... Social entrepreneurship is an excellent way to solve the problems of social inequality and poverty, thus leading to economic growth and development. The main goal of the research is to create a theoretical model of economic and social development through encouraging the development of social entrepreneurship. The research includes subjects of social entrepreneurship in the territory of Bosnia and Herzegovina. This paper refers to research on the impact of social entrepreneurship on the development of the economy and society. Other factors were declared constants. The research was carried out using a questionnaire, and regression and correlation methods were used for data analysis. The research results showed that social entrepreneurship can contribute to the economic and social development of Bosnia and Herzegovina.*

***Key words**: social entrepreneurship, economy, society, development, marginalized groups.*

JEL classification: O35

1. INTRODUCTION

Social entrepreneurship is a very important topic of the modern age. Changes and challenges in modern society lead to the strengthening of social entrepreneurship, which, in addition to economic activity, strives to fulfill some social goal. This research is focused on the connection and impact of the social entrepreneurship process on the development of the economy and society. The development of technology requires the development of innovative business models in all areas of business, including in the area of social entrepreneurship. Looking at social problems and becoming aware of them, a social entrepreneur must continuously offer innovative solutions for current social problems. There are three main reasons why people decide to become entrepreneurs and start their own businesses: "to be their own boss, to follow their own ideas and achieve financial rewards" (Barringer and Ireland, 2016, p. 7). When we add some social mission to these reasons, i.e. solving a social problem, we arrive at the concept of a social entrepreneur. Social entrepreneurship is a business with an idea of completing a clear social mission through the investment of profits realized from the sale of products or services. At the end of the 18th and the beginning of the 19th century, as a response to problems that were a consequence of major changes in the economies of that time, the concept of social entrepreneurship appeared for the first

time (Banjac and Dojčinović, 2016, p. 43). Poverty was a big problem at that time. Solving this problem, the first workers' cooperatives appeared in France and Italy, and the first functional cooperatives in Great Britain. In the 19th century, cooperatives played a leading role in the social economy sector, and were one of the oldest and most widespread forms of social enterprises (Volkmann, Tokarski and Ernst, 2012, p. 10). Problems such as long-term unemployment, social exclusion of certain categories of society, poor living conditions in rural areas, as well as problems in health and education, became very pronounced in the eighties of the 20th century. Then it became clear that the economy cannot deal with these problems in the traditional way of business. In those years, the concept of social economy and social entrepreneurship experienced expansion (Borzaga and Santuari, 2000, pp. 5-9). Social entrepreneurship became popular after the Nobel Prize, which was awarded in 2006 to the Bangladeshi banker and economist Muhammad Yunus (Yunus, Moingeon and Lehmann-Ortega, 2010).

This paper consists of seven parts: introduction, literature review, hypothesis development, research methods, results, discussion and conclusion.

2. LITERATURE REVIEW

According to Martin and Osberg (2007) "every definition of the term "social entrepreneurship" must begin with the word "entrepreneurship". The word "social" simply modifies entrepreneurship" (p. 30). Although there is enough space for discussion about whether the troubleshooting of selected social or environmental problems is the main or only the most important secondary goal of social entrepreneurship, the fact is that such companies differ from classic for-profit companies by the so-called principle of the "triple bottom line" - people, planet, profit (Haugh, 2006, p. 181). These companies differ from other classic for-profit companies on the market in measuring success not only by the profit they have achieved, but also by the degree of positive social or environmental changes they have produced - by the degree of created social capital (Santos, 2012, p. 344). Björk, Hansson, Lundborg and Olofsson (2014) define social entrepreneurship as the activities of individuals and groups that identify gaps in the social system, as an opportunity to serve those who are marginalized in different ways and whose goal is to address these needs in an entrepreneurial way. Dwivedi and Weerawardena (2018) define social entrepreneurship as a strategic orientation in behavior, expressed through the characteristics of innovation, proactivity, risk management, effective orientation, orientation towards social mission and orientation towards sustainability, aimed at solving failures on the social market and creating greater social values, to maximize social impact. "Social entrepreneurship is about the application of practical, innovative, sustainable approaches with the aim of developing society, with an emphasis on those who are marginalized and poor" (Schwabfound, n.d.). Canestrino, Ćwiklicki, Magliocca, and Pawełek (2020) state that social entrepreneurship is clearly market-oriented, while social innovations are not necessarily based on the market and can be found in any sector: public, real and non-profit. Carayannis, Grigoroudis, Stamati, and Valvi (2019) point out that social innovations are related to new products, services and models that aim to improve human well-being and create social relationships and cooperation.

The development of social entrepreneurship represents a concrete possibility of meeting the needs and solving the problems of marginalized, socially sensitive groups in local communities. Social entrepreneurship is important both as a stabilizing factor in the labor market and as a factor in the sustainable development of the community. According to Petričević (2012, p. 12), the direct impact of the work of social enterprises is recognized in the economic development of a community or region:

- with their activities, they supplement services of public interest (e.g. social services) that public institutions or private for-profit companies are not able to perform with sufficient quality;
- they contribute to the balanced use and distribution of available resources in favor of the local community;
- they generate new jobs in their areas of activity, and some social enterprises are especially focused on the integration of the long-term unemployed persons into the labor market;
- they encourage social cohesion and contribute to the growth and development of social capital;
- provide support for the institutionalization of informal entrepreneurial activities of the private profit sector, etc..

3. HYPOTHESIS DEVELOPMENT

At the peak of the global Covid-19 pandemic, which also affected the world economy, most of the government's previous moves, when the economy finds itself in crisis, proved to be insufficiently effective to overcome its consequences without creating additional economic and social "gaps". Therefore, an innovative approach is needed through socio-economic activities, in order to use all available

resources as generators of employment and new values. One of such models is social entrepreneurship. The initiative of social entrepreneurship promotion and research has reached global proportions. The first step towards this was the establishment of The Social Enterprise World Forum in 2008, which was launched as a joint platform that gathers social entrepreneurs from all over the world and promotes the further development of social entrepreneurship (Bosma, Sanders and Stam, 2018). The following year, in 2009, Global Entrepreneurship Monitor – GEM conducted the first research of social entrepreneurship at the world level, which showed that it occurs in different forms in all parts of the world. The last survey of social entrepreneurship conducted by GEM was in 2015. 167,793 adults from 58 countries around the world participated in this research. The report was published in 2016 (GEM, 2016). According to data from this report, as many as one in 10 individuals in Australia and the US are social entrepreneurs. Israel, Luxembourg and Ireland also have high rates of social entrepreneurship, as do sub-Saharan African economies such as Cameroon and Senegal. Regarding the financing of social entrepreneurial activity, more than a third of the world's social entrepreneurial ventures rely on state financing, while family and banks are also important sources of financing for social entrepreneurs. The contribution of social entrepreneurship in the total GDP of the EU is about 11%. In Finland, 7.5% of the active population is involved in social entrepreneurship, in Great Britain this number is 5.7%, in Slovenia 5.4%, in Belgium 4.1%, in Italy 3.3%, in France 3, 1% etc. Every fourth newly founded enterprise is a social enterprise. In Finland, France and Belgium it is even one in three (GEM, 2016, p. 5-33).

The increase in social problems leads to the development and strengthening of social entrepreneurship. Canada has the most developed social entrepreneurship sector in the world (Janelidze, 2020; Solomon, Alabduljader and Ramani, 2019; Mengel, 2018). The USA has the most developed educational system in the field of social entrepreneurship in the world. Some of the most famous foundations and organizations are Ashoka, Roberts Enterprise Development Fund - REDF, Skoll Foundation, Schwab Foundation for Social Entrepreneurship, William and Flora Hewlett Foundation, then David and Lucile Packard Foundation, Ford Foundation and others. In the period from 2003 to 2016, these foundations invested US$ 1.6 billion in the development of social entrepreneurship in the USA and around the world (Spicer, Kay and Ganz, 2019; Chliova, Mair and Vernis, 2020).

For the emergence and development of social entrepreneurship in Europe, the most significant role was played by cooperatives (Talić, Ivanović-Đukić and Rađenović, 2020). There are about two million companies operating in the social economy in the EU, which is about 10% of all European companies. About 13.6 million Europeans or about 6.5% of the working age population work in the social entrepreneurship sector today. 70% of these are employed in non-profit associations, 26% in cooperatives, and 3% in social enterprises. Social enterprises are present in almost all sectors of the economy, such as banking, insurance, agriculture, crafts, various commercial services and health and social services, etc. (OECD, 2021). In Great Britain there are as many as 100,000 social enterprises that employ almost a million people, and the annual goal of the social entrepreneurship support policy is to reach the number of 100,000 social enterprises with 2 million employees, whose share in Great Britain's GDP would be 60 billion pounds (Social Enterprise UK n.d.). Social entrepreneurship is also developed in France. In 2017, of all established companies, 61% have the status of a social enterprise (fra. Société par actions simplifies). 10% of all employees in France work in the social entrepreneurship sector (Petrella and RichezBattesti, 2020, p. 32).

Compared to developed countries, social and environmental problems are more dominant in underdeveloped countries, but even so, the potential of social entrepreneurship is still underutilized. There is no adequate institutional and legal framework, and especially laws that would more specifically regulate and encourage social entrepreneurship activities. The existing employment programs through social entrepreneurship that are being implemented are side actions and initiatives. The fact that B&H is a poor country where half of the population is on the poverty line speaks of the need for a systemic approach to social entrepreneurship, as an important lever for inclusion of difficult-to-employ categories in the labor market. This includes the public sector, private sector, civil society organizations. Cooperation, partnership and coordination are needed between them.

On the basis of these studies the hypothesis is:

H: *The model of encouraging the development of social entrepreneurship will contribute to the development of the economy and society.*

4. METHODS

The data was collected by a questionnaire consisting of two parts. The first part refers to general information about the respondents, and the second part refers to social entrepreneurship. The data were processed and presented graphically. All

data were arranged, grouped and processed according to the responses of the respondents and the arithmetic mean was calculated. In this way, the data is completely prepared for further analysis. The population in our research consists of subjects of social entrepreneurship in Bosnia and Herzegovina, 485 of them (N=485). (the authors came to this information independently). The territorial framework of the observed population refers to the territory of Bosnia and Herzegovina (B&H). The time frame of the observed population refers to a period of five months, from July to November 2021. The sample consists of 97 subjects of social entrepreneurship. 122 respondents were contacted with questionnaires, and 97 responses were received, which is a high percentage of successful responses to questionnaires (79.51%). Answers from the questionnaire are subject to statistical analysis. The sample refers to 20% of the population and therefore represents a significant part of the population and it represents a good picture of the population.

Binomial distribution was used in the research:

$$P(x) = \binom{n}{x} p^x q^{n-x} \quad (1)$$

za $x = 0,1,2,\dots,n$

$P(x) = 0$ for all other x

In order to be able to see the most important aspects of the Binomial distribution, it is necessary to determine the mean value, the variance and the standard deviation of the Binomial distribution. These values are obtained based on the following formulas (Lovrić et al., 2006, стр. 143, Đalić and Erceg, 2023):

Mean value: $\mu_x = E(X) = np$ (2)

Variance: $\sigma_x^2 = np(1-p) = npq$ (3)

Standard deviation: $\sigma_x = \sqrt{npq}$ (4)

The Chi-square test - X^2 was used to test the significance of the differences between the distribution frequencies, as well as to test the correlation between different characteristics (Lovrić et al., 2006, стр. 333):

$$X^2 = \sum_{i=1}^{r} \frac{(f_i - f_i^*)^2}{f_i^*} \quad (5)$$

Where f_i is the observed empirical frequency and f_i^* is the expected or theoretical frequency. r represents the number of frequency groups.

The appropriate p – value is determined, that is, the calculated value of the test statistic is compared with the critical (table) values from the X^2 distribution, with the appropriate number of degrees of freedom, and a conclusion is drawn.

The number of degrees of freedom ν is calculated separately for each case of change as follows:

df = ν = number of classes – number of restrictions.

5. RESEARCH RESULTS

The research covered the entire territory of BiH (Table 1).

Table 1. Headquarters of the respondent

No. of respondents	Headquarter
12	Sarajevo
11	Mostar
10	Banja Luka
4	Tuzla, Vareš
3	Prijedor, Bijeljina, Zenica, Foča, Jablanica, Brčko
2	Bratunac, Ustikolina, Konjic, Istočna Ilidža, Doboj, Šamac, Istočno Sarajevo
1	Zavidovići, Teslić, Sanski Most, Olovo, Breza, Laktaši, Goražde, Gacko, Grahovo, Opština Sapna, Šekovići, Prnjavor, Žepče, Ljubinje, Gradačac, Modriča, Kladanj, Lopare, Srebrenica, Trebinje, Domaljevac, Rogatica, Brod, Prozor-Rama

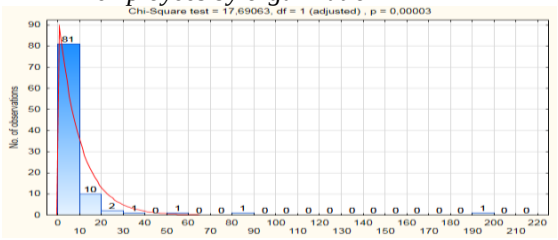
Source: *Author.*

The median year of establishment of respondents is 2006.68. Most of the social enterprise entities that participated in the research were registered as citizens' associations (28.9%), followed by limited liability companies (23.7%), followed by independent entrepreneurs (18.6%).

The research results show that subjects of social entrepreneurship in Bosnia and Herzegovina deal with various businesses. 25.8% of respondents are engaged in agriculture, which is the most represented activity in the sample. In second place is the store with a 22.7% share in the total sample. In third place is the provision of psychological and health services with 9.3% participation.

The number of employees per organization is approximately exponentially distributed, determined by the large unevenness of the number of employees. The largest, dominant group consists of companies with up to 10 employees (81 companies), and the average number of employees is 10,092. Therefore, the survey mostly covered micro-enterprises (Figure 1).

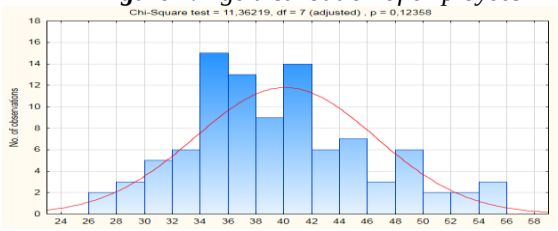
Figure 1. *Distribution of the number of employees by organization*



Source: *Author.*

The average life expectancy of employees is normally distributed, with a mean age of 40.104 years, with a standard deviation of 6.49 years (X^2=11,36219, df=7, p=0,12358). This distribution is shown in Figure 2.

Figure 2. *Age distribution of employees*



Source: *Author.*

Table 2 shows the answers to the question "Which social problems does your organization deal with?". From the analyzed responses, it can be concluded that the most frequent problem is the inclusion of marginalized groups of society in economic flows. Next, there is the education of marginalized groups of society through various educations, seminars and trainings, as well as health care and other problems that the respondents try to solve through their activities.

Table 2*. Social problems*

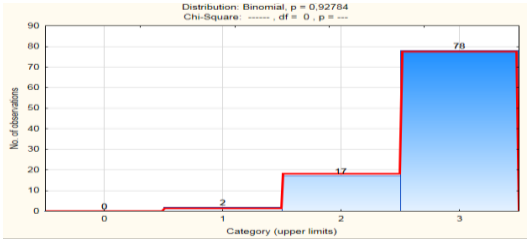
No.	Social problems	Responses
1.	Inclusion of marginalized groups of society in economic flows	83
2.	Education of marginalized groups of society	36
3.	Health care	23
4.	Environmental problems	11
5.	Other	5

Source: *Author.*

To the question "How does your organization get involved in solving the mentioned problems?", most respondents (50.5%) answered that they employ people with disabilities. 37.1% of respondents provide assistance in the education of marginalized members of society, while 28.9% of respondents provide assistance in providing health care for these members of society. 19.6% of respondents provide financial and other assistance in the treatment of patients from various fields, while 14.4% of respondents deal with solving environmental problems.

Distribution of answers to the question "For my organization, value creation for society and the environment is more important than financial value creation for the organization." with the following answers ((0) do not agree at all - no answer, (1) do not agree 2 - responses), (2) agree - 17 responses, (3) completely agree - 78 responses) was verified by a significant binomial distribution (p>0,9999) with the parameter p=0,9278. Out of 97 respondents, the mathematical expectation of 2.7835 and the standard deviation of 0.4615 with mode 3 (group of 78 responses) were realized (Figure 3).

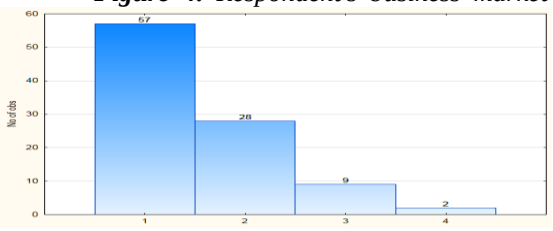
Figure 3. *Binomial distribution: Value creation for society and the environment is more important than financial value creation*



Source: *Author.*

The distribution of answers to the question related to the market in which organizations operate, (possible answers: local market, national market, regional market and global market) is given in the following histogram (Figure 4) . Figure 4 shows that 57 or 58.76% of the respondents operate in the local market, 28 or 28.87% in the national market, 9 or 9.28% in the regional market and 2 or 2.1% of the respondents operate in the global market and one organization is non-profit.

Figure 4. *Respondent's business market*



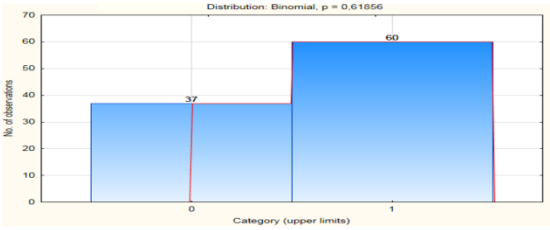
Source: *Author.*

The answers to the question "What products/services does your organization offer on the market?" are very heterogeneous. Most respondents offer agricultural products, such as honey and honey products, fruit and vegetable products, cereals, healthy food, medicinal plants, dairy products and others. There are also those

who offer unique items and handicrafts on the market, as well as creams and salves. Then, there are respondents who offer health care and socialization services, as well as social assistance to marginalized members of society. A part of the respondents on the market offers education and training services, as well as marketing and financial services. A small part of respondents offers catering services.

The distribution of answers to the question "In the last three years (from 2018 to 2021) my organization has placed a new product or service on the market" is a binomial distribution with exclusive answers ((0) No and (1) Yes) and parameter of mean values of p=0,6185 which is analogous to the prevalence of positive responses (61.85%) (Figure 5). The figure shows that 60 respondents placed a new product or service on the market in the period of the mentioned three years.

Figure 5. *Elementary binomial distribution of new product or service launch*

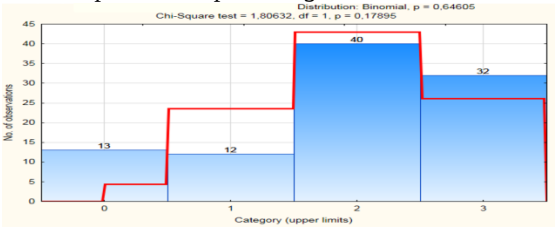


Source: *Author.*

Distribution of answers to the question "In the last three years (from 2018 to 2021), my organization has introduced some innovation in the way of producing products or providing services" with the following answers ((0) do not agree at all, (1) do not agree, (2) agree, (3) completely agree) was verified (p=0,1789>0,05) by binomial distribution with parameter p=0,7345 (X^2=1,80632, df=1) (Figure 6). From 97 respondents, the mathematical expectation of 1.9381 and standard deviation of 0.9980 with mode 2 (group of 40 responses) was realized. This distribution of responses highlights two homogeneous groups in which the primary commitment (positive or negative) is clear, but the gradation of these commitments is not complete. The answers are moderately eccentric:

- A total of 25/97=0.2578 answers correspond to the negative answer from the question "In the last three years (from 2018 to 2021), my organization has placed a new product or service on the market" (37/97=0.3814).
- A total of 72/97=0.7422 answers correspond to a positive answer from the question "My organization has placed a new product or service on the market in the last three years (from 2018 to 2021)" (60/97=0.6185).

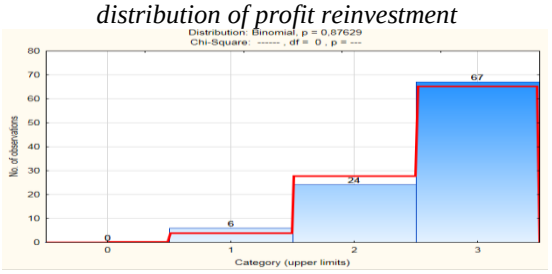
Figure 6. *Significant binomial distribution of the introduction of innovation in the way of producing a product or providing a service*



Source: *Author.*

Here is the question about the difference between "new product" and "innovation" from the previous two questions. If the new product is set as an independent factor and the influence of this factor on innovation as a dependent variable, the agreement of the response (p=0,00011) is confirmed, by analysis of variance, i.e. all respondents, who answered positively or negatively to the first question related to "new product", significantly transferred the answer to "innovation", i.e. organizations that introduced a "new product" also introduced an "innovation".
Distribution of answers to the question "Profit will be reinvested to serve the social or environmental purpose of my organization" with the following answers ((0) do not agree at all, (1) do not agree, (2) agree, (3) completely agree) was verified by a highly significant (p≈1) binomial distribution with parameter p=0,8762. From 97 respondents, the mathematical expectation of 2.6288 and the standard deviation of 0.6006 with mode 3 (group of 67 responses) were realized. A total of 91 answers are in the positive domain, and regardless of the absence of a new product (37/97) or innovation (25/97), respondents believe in the reinvestment of profits for social or environmental purposes (Figure 7).

Figure 7. *Significant binomial distribution of profit reinvestment*



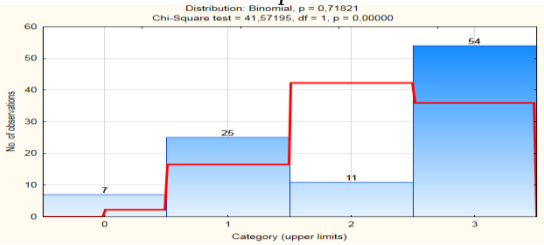
Source: *Author.*

It is important to note here that only 6 respondents remained in the negative domain of the answer to the previous question (6/97=0.0618), which using the proportion test highlights a significant difference compared to the negative domain of "new product" (37/97=0, 3814) with a significant

difference (p=0,0001) or "innovation" (p=0,0002) which speaks of high optimism towards purposeful investments.

Distribution of answers to the question "My organization invests a significant effort in measuring the social and environmental impact of its activities" with the following answers ((0) do not agree at all, (1) do not agree, (2) agree, (3) completely agree) was verified by non-significant binomial distribution (X^2=41,57195, df=1, p≈0) with parameter p=0,7182. From 97 respondents, the mathematical expectation of 2.1546 and the standard deviation of 1.0442 with mode 3 (group of 54 answers) were realized (Figure 8).

***Figure 8**. Non-significant binomial distribution of investment of significant effort in measuring social and environmental impact*

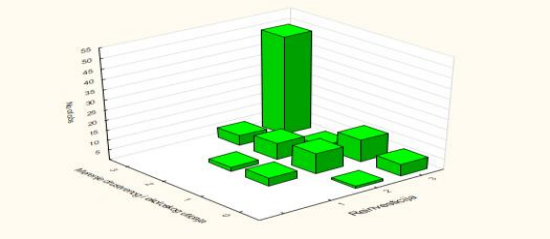


***Source:** Author.*

There is a significant difference between questions related to willingness to invest profits for social and environmental purposes and questions related to efforts to measure social and environmental impact (highly verified and unverified binomial distributions confirm this fact). If the intention to reinvest profits is considered as an independent factor, and the investment of effort in measuring the social and environmental impact as a dependent one, the analysis of variance shows the absolute absence of the influence of the factor (p=0,0000)!

Figure 9 shows a bivariate histogram of the relationship between profit reinvestment and effort in measuring social and environmental impact. It shows that 22 respondents who are ready for profit reinvestment (let's remind: 91 respondents answered positively to the question about profit reinvestment, Figure 7) absolutely disagree or disagree that they invest significant effort in measuring the social and environmental impact of their activities (22/91=0.2417). Although the answer is not satisfactory, it is encouraging due to the self-criticism of the respondents.

***Figure 9**. Relationship between profit reinvestment and effort in measuring social and environmental impact*

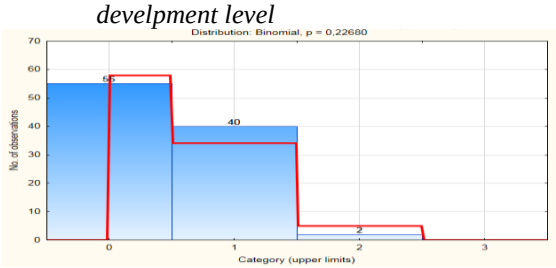


***Source:** Author.*

The reason for the discrepancy in desired reinvestments versus realistic measurement of social and environmental impact is somewhat clarified by analyzing the descriptive (non-numerical) answer to the following question from the questionnaire: "If you chose option 2 or 3 in the previous question, please briefly describe how you measure social and environmental impact of your organization". Namely, out of 65 positive answers to the question "My organization invests a significant effort in measuring the social and environmental impact of its activities", 61 are aimed at measuring the social impact, 2 are aimed at measuring the environmental impact and two answers were not offered. In this sense, it is undeniably concluded that the discrepancy arose at the level of preference for social influence, while the ecological influence is ignored or not recognized.

And finally, in the part related to social entrepreneurship, to the question "We are satisfied with the level of development of social entrepreneurship in our economic environment" (with answers: (0) I do not agree at all, (1) I do not agree, (2) I agree se, (3) I completely agree), a crushing response is obtained, which is reflected in general dissatisfaction. As many as 95 out of 97 respondents (95/97=0.9793) of the absolutely insignificant binomial distribution (eccentrically negative) gave answers from the negative domain, and only 2 respondents from the positive domain, where not a single respondent had absolute agreement with the question. From 97 respondents, the mathematical expectation value of 0.4532 and the standard deviation of the value of 0.5404 with the mode (group of 56 responses) were realized (Figure 10).

Figure 10. *Binomial distribution of satisfaction of the social entrepreneurship develpment level*



Source: *Author.*

The answers to this question show complete dissatisfaction with the level of social entrepreneurship development.

In developed countries, social entrepreneurship is at a very high level of development. Social entrepreneurship in the USA, in the period from 2003 to 2016, invested US$ 1.6 billion in the development of social entrepreneurship in the USA and the world (Spicer, Kay and Ganz, 2019; Chliova, Mair and Vernis, 2020). The contribution of social entrepreneurship in the total GDP of the EU is about 11% (GEM, 2020). There are about 2.8 million companies in the social economy in the EU, and that is about 10% of all European companies. About 13 million Europeans or about 6.3% of the working-age population work in the social entrepreneurship sector today (OECD, 2020).

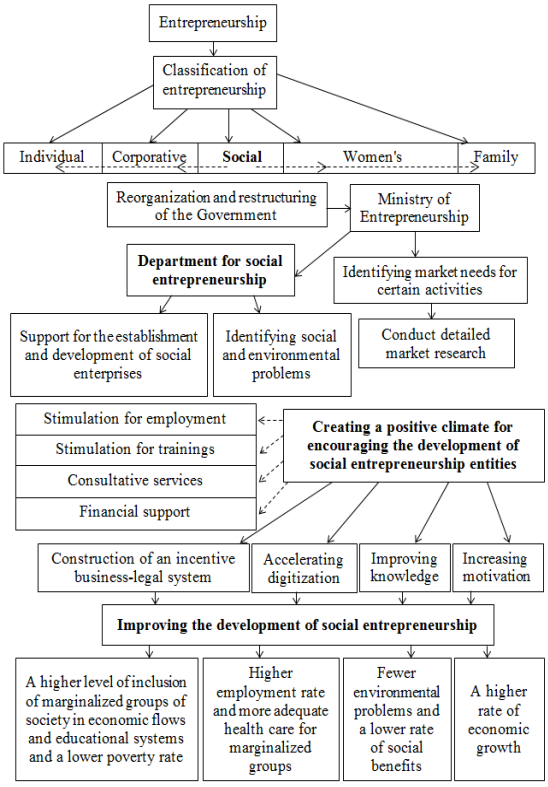
In December 2021, the Law on Social Entrepreneurship was adopted in the RS ("Official Gazette of RS", number 111/21). However, this Law has not taken root in the RS yet. There are certain laws that touch on social entrepreneurship in certain articles (Đalić and Erceg, 2023a, p. 45). In 2017, the Ministry of Health and Social Protection of the Republic of Srpska developed the Strategy for Improving the Social Position of Persons with Disabilities in the Republic of Srpska 2017-2026, in which the development of social entrepreneurship is defined as one of the goals (Vladars.net, 2017). In 2018, the Ministry of Labor and Veterans and Disability Protection formed the Platform for the Development of Social Entrepreneurship in the Republic of Srpska (Vladars.net, 2018).In the Federation of Bosnia and Herzegovina, the Social Inclusion Strategy was developed, which represents the elaboration of the strategic goal of social inclusion from the B&H Development Strategy (Unicef.org, 2020).

In the Federation of B&H, a Platform on social/social entrepreneurship in the Federation of B&H was created (Blc.edu.ba, 2016, pp. 130-140).

The law on social entrepreneurship has not been adopted in other parts of B&H. According to the results of the research, the literature and the analysis of the legal framework of B&H, it can be seen that there are certain developments regarding the laws and regulations that regulate social entrepreneurship. Certain laws, guidelines and regulations have been adopted. However, there is a big problem with the implementation of these legal regulations. Therefore, the conclusion is that the development of social entrepreneurship would contribute to the development of society and economy in B&H. Therefore, *the research hypothesis is confirmed.*

In Figure 11, certain measures are proposed that would lead to the development of social entrepreneurship, which will enable the development and improvement of the economic and social image of B&H.

Figure 11. *Model of social entrepreneurship development*



Source: *Author.*

The model shows the steps that, if implemented, would lead to the development of social entrepreneurship. First of all, it is necessary to properly classify entrepreneurship as shown. Next, it is necessary to form the Ministry of Entrepreneurship, in which the department for social entrepreneurship would function. This would give better state support to the development

of social entrepreneurship. It is necessary to create a positive climate for improving the development of social entrepreneurship through stimulating training and employment, financial resources and consulting services. It is necessary to create a stimulating business and legal environment, speed up digitization, improve knowledge and increase motivation. In this way, the development of social entrepreneurship would be improved, which would result in a higher level of involvement of marginalized groups in the business and educational systems, poverty reduction, better health care for these groups and a reduction in social benefits, and ultimately an increase in the rate of economic growth.

6. DISCUSSION

Popkova and Sergi (2020) investigated the directions of future development of social entrepreneurship in Russia and Asia. They investigated the factors influencing the development of social entrepreneurship. Unlike our research, which covers the territory of B&H, this research covered a huge area of Asia and Russia. The research covered as many as 10,000 social enterprises (p. 14). They proved that social entrepreneurship in this area is at a low level of development, but that it contributes to increasing the ecological effects of the economy as well as increasing education in these countries (p. 16). According to their research, the majority of social enterprises are in the infrastructure development sector, while according to our research, the majority are engaged in agriculture.

Torres and Augusto (2020) made a quantitative comparative analysis of the impact of digitization and social entrepreneurship on national well-being between 27 countries in the world in the period from 2016 to 2018. The absence of social entrepreneurship can contribute to a low level of national well-being in countries that show a low level of digitization, poor education systems and inadequate governance. Thus, the results of this research support the idea that social entrepreneurship is more important in countries where governments do not meet social needs (p. 6).

Đalić and Erceg (2023a) examined the impact of social entrepreneurship on the development of a transitional economy and society. In their paper, they proved that social entrepreneurship has a significant impact on the development of the economy and society, and that it is particularly important for countries in transition.

CONCLUSION

Social entrepreneurship is a form of entrepreneurship where business activity is carried out for the purpose of solving certain social problems. There are numerous social problems that communities face, such as unemployment of marginalized groups of society, insufficiently developed social and health care, environmental problems and many others. Social entrepreneurship offers solutions to these problems by activating marginalized groups of society and including them in economic and social flows, as well as by having a positive effect on the ecological environment, which is really threatened in modern times. The empirical research included 97 social entrepreneurship entities from all over Bosnia and Herzegovina. The survey was conducted using a questionnaire. The questions related to general information about social entrepreneurship subjects and social entrepreneurship.

Limitations in the research are a lack of official data on the number of social entrepreneurship entities in Bosnia and Herzegovina, as well as misunderstanding of the institutions about the importance of social entrepreneurship.

Based on empirical and theoretical research, it is concluded that the model of encouraging the development of social entrepreneurship can contribute to the development of the economy and society of B&H.

A couple of questions that need to be answered in the future are: Are the social entrepreneurship entities ready to introduce innovations that will enable the technological progress of Bosnia and Herzegovina? How to encourage the development of modern ways of financing social entrepreneurship entities and their digitization?

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ECONOMIC IMPLICATIONS OF SERBIA'S DEMOGRAPHIC TRANSITION

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***Abstract**: A significant shift occurs in the economic trajectory of nations as they transition from a state characterized by limited prosperity, high child mortality rates, and high fertility to a phase marked by increased prosperity, reduced child mortality, and lower fertility levels. Following a review of the economic literature on the connection between demographics and economics, this paper aims to explain the correlation between Serbia's demographic patterns and economic development since 2000. It demonstrates that this transition is best understood through a developmental cycle involving child mortality rates, fertility rates, and nominal GDP. Fertility rates tend to rise alongside GDP growth, while the child mortality rate is closely linked to GDP levels. However, the correlations between fertility rates and child mortality are comparatively weaker. The paper showcases how this research can be utilized to assess policy measures and establish more precise, country-specific development targets.*

***Key words**: demographic transition, GDP, fertility, child mortality*

JEL classification: A120, J1

1. INTRODUCTION

After a two-year global pandemic that fundamentally altered both societal and individual life, the world is entering a period of new challenges for sustainable development in a post-pandemic era. In addition to short-term and intense shocks, such as the pandemic, our society is also facing subtle changes that are equally challenging, if not more so, to address: from environmental and climate challenges, through digitalization and the decline of trust in institutions, to demographic changes. These represent a less dramatic but equally complex test of resilience and adaptability, upon which future sustainable development will depend.

Unlike a few decades ago, when the attention of demographers and policymakers was focused on population growth and the threats this process posed to sustainable development and well-being, today the situation is somewhat different. In a significant number of countries, including most Eastern European countries and Serbia, the population is declining. Population decline has occurred in earlier historical periods as well, but due to wars and diseases or circumstances fundamentally beyond the control of ordinary people. This period in history is different because the population is declining due to individual decisions of people, decisions not to have children or to have fewer children, and to migrate to other regions and countries (Lutz and Gailey, 2020).

Serbia has been grappling with a decline in population numbers over the past three decades, prompting increasing attention from the public and government stakeholders on demographic dynamics. Various support measures for parenthood have been in place for some time, ranging from extended maternity leave and childcare absence to a network of public and private preschool institutions (Stanojevic et al, 2022). At the beginning of the 21st century, a one-time parental allowance for second, third, and fourth children was introduced. This program has since been revised to provide parental allowances for up to the fourth child and has been expanded with housing policies aimed at facilitating home purchases for young parents. Although long-standing and complex, these policies have largely been geared toward encouraging childbirth.

Strategies to address declining fertility rates were adopted in 2008 and 2018. At the beginning of the millennium, demographic issues were the

responsibility of the Ministry of Labor. As demographic issues gained prominence, a minister without a portfolio responsible for demographic issues was appointed in 2016. In 2020, the Ministry for Family Welfare and Demography was established (Ministarstvo za brigu o porodici i demografiju Republike Srbije, 2024).

Therefore, the declining birth rate has brought demographic issues to the forefront of public discourse. To date, state interventions in demographic issues have largely been directed toward the private domain, attempting to influence decisions regarding childbirth. The primary focus on demographic outcomes has indeed been in the private domain, where the scope for intervention is simultaneously limited. The state can also intervene in the broader space of public policies and social relations, such as urban planning, labor market, public sector, education, etc. The effects of state interventions will be much greater in these areas and will show the economic implications of the present demographic transition. This shift in focus is precisely what has been looked at in this paper; it demonstrates how demographic changes are a developmental issue requiring a complex and comprehensive societal response.

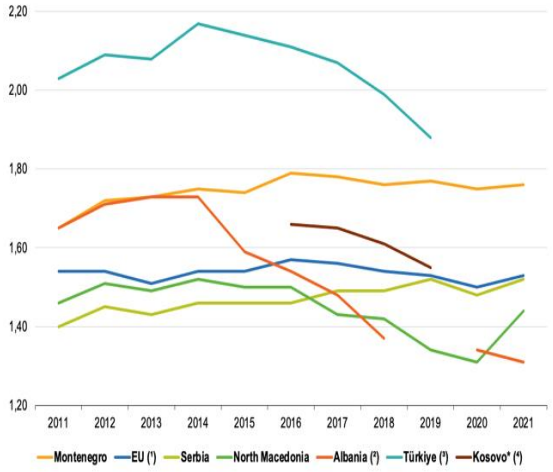
2. DEMOGRAPHIC TRANSITION IN SERBIA

The demographic transition in Serbia is characterized by significant changes in population dynamics, fertility rates, mortality rates, child mortality rates, and migration patterns over the past few decades. On one hand, in addition to all the above-mentioned, Serbia's population is undergoing a rapid aging process, which presents significant challenges and implications for the country's socio-economic landscape. The median age in Serbia has been steadily increasing, reflecting an older population structure. This demographic shift is primarily driven by declining fertility rates and increased life expectancy, resulting in a growing proportion of elderly people relative to the working-age population. On the other hand, internal migration within Serbia has also influenced population changes, with a trend of rural-to-urban migration and movement from smaller to larger cities. The regions around Belgrade, Novi Sad, and other urban centers have seen population growth, while many rural and less developed regions have experienced depopulation. This internal migration pattern has led to regional disparities in population distribution, economic development, and access to services.

For the purpose of the research in this paper, we will specifically focus on fertility rates and child mortality rates, as one of the most important aspects when it comes to economic implications, as discussed in the literature (Sedano, 2008; Lee and Mason, 2010; Ranganathan et al., 2015; Gotmark and Andersson, 2020).

Serbia, like many other countries in Eastern Europe, has been experiencing a decline in fertility rates over the past few decades (Zgirski, 2020), although with a slight increase in the last couple of years (as shown in Figure 1 and Table 1). The total fertility rate (TFR), which represents the average number of children a woman is expected to have during her lifetime, according to the latest available data, for Serbia is below the replacement level of 2.1 children per woman, standing at approximately 1.63 children per woman, in 2022 (Statistical Office of Serbia, 2023).

Figure 1. Fertility rates 2011-2021



Source: Eurostat, 2022.

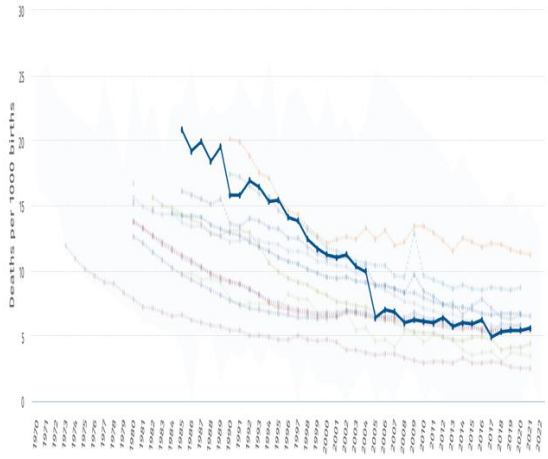
Developed areas around Belgrade and Novi Sad have higher fertility rates than Eastern and Southeastern Serbia, although the average age at first childbirth is above the national average (Nikitović et al., 2019), which should also be noted.

This slight increase in fertility rates in the last few years can be attributed to a combination of economic, social, cultural, and policy factors shaping individuals' decisions about family formation. One significant factor contributing to the uptick in fertility rates is improvements in economic stability seen through the rise in GDP (Table 1). Greater economic security has created a more favorable environment for couples to consider expanding their families. Government policies and initiatives such as family-friendly workplace policies, parental leave benefits,

childcare subsidies, and tax incentives for families provide tangible support to couples contemplating parenthood, thereby contributing to the increase in fertility rates. Shifts towards acceptance of working mothers, and changing perceptions of parenthood have contributed to a more positive outlook on family life, encouraging couples to consider having children, while strong social ties and support from extended family members create a supportive environment for raising children, making parenthood a more appealing prospect for many couples. In addition, delayed childbearing, often driven by educational and career pursuits, may also contribute to the increase in fertility rates as individuals reach their late twenties or early thirties and feel more ready to start a family. Last but not least, access to fertility treatments (Republički fond za zdravstveno osiguranje Republike Srbije, 2023) enables individuals to plan their families according to their preferences and circumstances.

Child mortality rates, which refer to the number of fetal deaths per 1,000 total births, are another critical aspect of reproductive health that warrants attention in Serbia. According to recent data, Serbia has a child mortality rate of approximately 5 per 1,000 total births, which is higher than the rates reported in many Western European countries (Statistical Office of Serbia, 2023).

Figure 2. Child mortality rate in Serbia 1985-2022



Source: World Health Organization, 2022.

Several factors can contribute to the high stillbirth rates in Serbia, including inadequate prenatal care, limited access to quality healthcare services in rural areas, and maternal health issues such as hypertension and diabetes. Additionally, socio-economic disparities and insufficient awareness about the importance of prenatal health and regular health check-ups among expectant mothers especially the ones living in rural areas contribute to the high stillbirth rates. Efforts to address the high stillbirth rates in Serbia include improving access to quality prenatal care, enhancing maternal health education and awareness, and implementing policies to reduce socioeconomic disparities in healthcare access. Collaborative efforts involving healthcare providers, policymakers, and community organizations are essential to effectively reduce stillbirth rates and improve reproductive health outcomes in Serbia.

Looking at Figures 1 and 2, it can be concluded that fertility rates are slowly increasing, while child mortality rates have significantly dropped from 1985 until the 2000s. After that, they remain around 5 per 1,000 total births.

But what about the economic implications of this demographic transition? Does this transition have a connection with the economic situation in Serbia? To answer these questions, the nominal Gross domestic product (hereafter GDP) will be used as a point of economic growth of Serbia. Serbia's GDP is a key indicator of the country's economic performance and development. Over the past few years, Serbia has seen relatively modest GDP growth rates (see Table 1). The country's economy is primarily driven by industry, and agriculture, with the services sector contributing the largest share of the GDP. To better understand the interconnection between demographic transition shown through fertility rates and the child mortality rate, and economic implications showcased as GDP, this paper will refer to the correlation analysis in point 3.

3. OBJECTIVE AND METHOD OF RESEARCH

The research aims to assess the correlation between the GDP of Serbia, fertility rates, and child mortality rate. The selection of fertility rates and child mortality rates as the focal points of this research is grounded in their recognized significance within the field, as highlighted in the existing literature. Drawing from scholarly sources such as Sedano (2008), Lee and Mason (2010), Ranganathan et al. (2015), and Gotmark and Andersson (2020), these variables have emerged as critical indicators with profound economic implications. By delving into these aspects, this research aims to contribute to understanding the interplay between demographic trends and economic dynamics. Fertility rates and child mortality rates are fundamental components of population dynamics and have far-reaching implications for social welfare, healthcare systems, labor markets, and overall economic

development. As such, they serve as key metrics for assessing the socio-economic well-being of nations and are often used as indicators of a country's demographic transition and developmental progress. By focusing on these variables, this research endeavors to shed light on the underlying mechanisms driving population trends, inform policy interventions, and facilitate evidence-based decision-making in the realm of public health, social policy, and economic development. Therefore, the selection of fertility rates and child mortality rates as the basis for this research and methodology is informed by their pivotal role in shaping economic outcomes and their significance within the broader scholarly discourse.

This paper is founded on data publicly available at the Statistical Office of Serbia (2023). The data has been meticulously collected from 2000, until 2022, when the last population census took place in the country.

Fertility rates show the total fertility rates (TFRt), i.e. the total number of live births per woman, and were calculated for the age interval from 15 to 49 years per five years, according to the following formula:

$$TFRt = \frac{5^* \sum f_{t,\ x1-\ x2}}{1000}$$

where $f_{t,\ x1-\ x2}$ denotes the number of live births born to mothers at age x1 – x2.

Child mortality rate (n^t_{mr}) is defined as the number of stillbirths per 1000 live births in the observation year, and is calculated according to the following formula:

$$n^t_{mr} = \frac{N^t_{mr}}{N_t} \text{ x } 1000$$

Nominal GDP is shown through current prices. Nominal GDP has been chosen as it provides a comprehensive measure and makes it particularly useful for macro-level analysis of economic growth, output, and overall economic activity. The mentioned GDP allows researchers to assess the size and strength of an economy, compare economic performance across different periods, and evaluate trends in economic activity. This makes nominal GDP valuable for policy analysis, and assessing the overall health and performance of an economy (Investopedia, 2024). The publicly available data is shown in Table 1.

Table 1. GDP, Fertility rates, and Child mortality rate in Serbia (2000-2022)

Year	GDP*	Fertility rates	Child mortality rate
2000	434319	1.458	5.02
2010	3250581	1.405	5.68
2018	5072932	1.484	5.39
2019	5421851	1.518	5.56
2020	5504431	1.480	5.77
2021	6271988	1.520	5.47
2022	7097629	1.630	5.37

Source: Statistical Office of Serbia (2023)
**** In millions of Serbian dinars (RSD)***

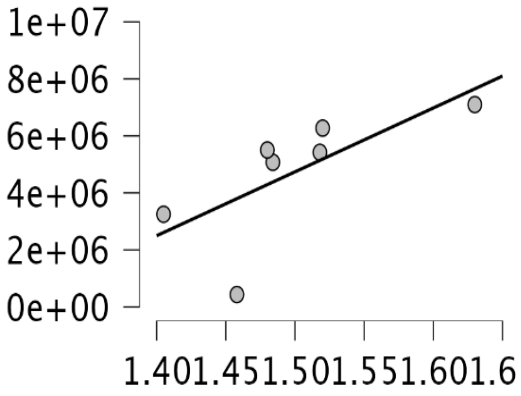
4. RESEARCH RESULTS

To analyze the relationship between GDP, fertility rates, and child mortality rate, correlation was used. The Pearson correlation coefficient denoted as r, measures the intensity of a linear association between two variables. It aims to determine the best-fit line through the data points of the two variables. The resulting coefficient, r, shows how much the data points diverge from this ideal line.

The Pearson correlation coefficient, r, ranges between +1 and -1. A value of 0 signifies no correlation between the variables. A positive r-value indicates a direct relationship, meaning an increase in one variable corresponds with an increase in the other. On the other hand, a negative r-value suggests an inverse relationship, where an increase in one variable correlates with a decrease in the other (Laerd Statistics, 2020).

Figures 3, 4 and 5 show correlation results.

Figure 3. GDP- Fertility rates correlation



Source: Author

Figure 3 displays the relationship between GDP and fertility rates. The positive correlation observed indicates that as GDP increases, fertility rates also tend to rise. This suggests that economic prosperity, as reflected by GDP, influences family

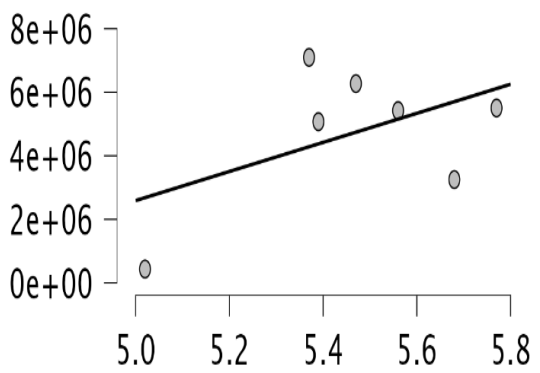
planning decisions and fertility behavior within the population.

Several mechanisms may underline the observed relationship between GDP and fertility rates. Economic prosperity often leads to improved access to education and social services, which can enhance individuals' well-being and confidence in raising children. Higher GDP may also be associated with greater financial stability, enabling families to afford the costs associated with childbearing and child-rearing, such as healthcare expenses, education, and childcare. Moreover, rising GDP may be accompanied by shifts in attitudes towards childbearing, and expectations regarding gender roles, which can impact fertility trends. Additionally, economic growth may contribute to changes in the age of marriage, family structures, and aspirations for parenthood, further shaping fertility patterns.

The Pearson correlation coefficient of 0.699 indicates a strong positive correlation between GDP and fertility rates. This means that approximately 69.9% of the variability in fertility rates can be explained by changes in GDP.

A correlation coefficient of 0.699 falls within the range of 0.5 to 1, indicating a large strength of association between GDP and fertility rates. Such a robust correlation suggests that economic factors play a significant role in shaping fertility patterns in Serbia.

Figure 4. *GDP- Child mortality rates correlation*



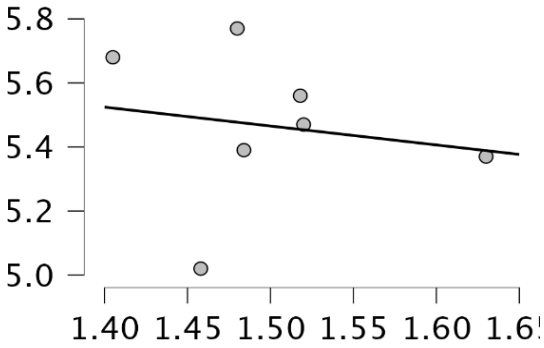
Source: Author

Figure 4 presents the relationship between GDP and child mortality rates. The positive correlation observed indicates that as GDP increases, child mortality rates also tend to rise.

This suggests that economic growth can exacerbate disparities in access to healthcare services. While overall GDP may increase, marginalized or impoverished people living in Serbia may still lack access to essential healthcare services, including prenatal care, vaccinations, and treatment for childhood illnesses. This can result in higher child mortality rates within these disadvantaged communities despite overall economic growth, which is especially significant for people living outside of Serbia's major cities and towns (Belgrade, Novi Sad, Kragujevac, Niš, etc.). Economic growth does not necessarily address underlying social determinants of health, such as poverty, inequality, and social exclusion. Persistent socioeconomic disparities, especially in rural areas, can limit access to education, employment opportunities, safe housing, and social support networks, all of which are important determinants of prenatal health and well-being. Without addressing these structural barriers, economic growth alone may not translate into improved child health outcomes, i.e. reduced child mortality rates.

The Pearson correlation coefficient of 0.504 indicates a positive correlation between the two variables. This means that approximately 50.4% of the variability in child mortality rates can be explained by changes in GDP. A correlation coefficient of 0.504 falls within the range of 0.5 to 1, indicating a large strength of association between GDP and child mortality rates.

Figure 5. *Fertility rates- Child mortality rate correlation*



Source: Author

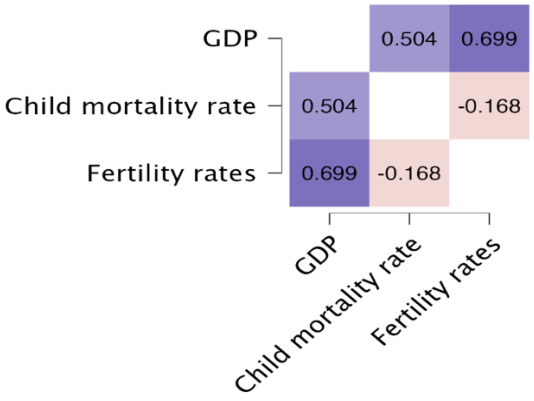
The final correlation figure (Figure 5) presents intriguing insights into the relationship between fertility rates and child mortality rates, revealing a notable negative correlation between these two critical demographic indicators. The observed negative correlation suggests that as fertility rates increase, child mortality rates tend to decrease, underscoring the complex dynamics between population growth and child health outcomes.

A number of elements may contribute to the observed negative correlation between fertility rates and child mortality rates. Higher fertility rates may lead to changes in population structure, including a larger proportion of younger individuals, which can influence investment in maternal and child health, healthcare infrastructure, and social support systems.

Additionally, the rise in fertility rates may be associated with improvements in maternal and child healthcare, and family planning services, which can contribute to lower child mortality rates.

The Pearson correlation coefficient of -0.168, indicates a modest strength of association between fertility rates and child mortality rates. This implies that approximately 16.8% of the variability in child mortality rates can be explained by changes in fertility rates. While the correlation coefficient falls within the range of 0.1 to 0.3, representing a small strength of association, it nonetheless highlights the importance of considering demographic factors in understanding child health outcomes seen through child mortality rates.

***Figure 6**. Pearson's r heatmap*



Source: Author

Pearson's r heatmap illustratively points out the correlation coefficients between GDP, fertility rates, and the child mortality rate. As shown in Figures 3,4, and 5, GDP correlates positively with fertility rates and the child mortality rate (r=0.699 and r=0.504, respectively), while fertility rates and the child mortality rate correlate negatively and with a small strength of association (r=-0.168).

CONCLUSION

Serbia's demographic transition is progressing rapidly, with significant shifts in age distribution towards older cohorts. The country has been experiencing declining fertility rates for decades, and child mortality rates have been stagnant for 20 years instead of decreasing, which is contributing to negative rates of population growth. This decline in fertility rates can be attributed to various factors, including economic challenges, migration, and societal changes.

Migration patterns in Serbia, particularly the emigration of young and skilled individuals, are affecting the country's fertility rates. A significant number of young Serbians are leaving the country in search of better opportunities abroad, leading to a decrease in the working-age population and contributing to the overall decline in fertility rates. This migration trend, if not addressed, could exacerbate the demographic aging process and its economic implications.

Serbia's demographic projections indicate that before facing a significant increase in the elderly population, the country will see a declining share of the working-age cohort. This demographic pattern provides Serbia with a limited window of opportunity in the next two decades to shape a positive demographic transition. To maximize this potential, Serbia needs to focus on further improving education and training, labor market reforms, and infrastructure development to enhance the overall economic welfare of its citizens.

Thankfully, Serbia has introduced several reforms in recent times to address the economic implications of decades of demographic aging and declining fertility rates, which shows some results as seen in the slight increase in fertility rates in the last couple of years. These reforms include measures to improve education and training, make the creation of formal jobs more affordable, and enhance infrastructure, particularly in less developed regions. However, more comprehensive and targeted policies are needed to fully capitalize on the demographic transition and stimulate economic growth.

As for scenarios for economic implications of demographic transition, two can be plausible:

Scenario 1: Stagnant Economic Progress
If Serbia fails to implement further reforms to turn around the low fertility rates and suppress child mortality rates, the economic outlook is not promising. A larger elderly population with insufficient income to afford goods and services could lead to weak economic development and lower demand for sophisticated goods and services. In comparison, the younger population will be less prominent and mostly migrate to the West.

Scenario 2: Economic Reforms and Growth
Under this scenario, Serbia implements further reforms to make its economy more competitive and create a significant number of jobs. A larger, better-educated, and more productive workforce finds employment opportunities, raising living standards and stimulating demand for goods and services. Young people stay in the country which raises the fertility rates. Due to economic

progress, people get better medical attention which leads to a decrease in child mortality rates.

For the European Union, particularly neighboring countries and potential trading partners like Serbia, a stronger Serbian economy capable of capitalizing on the demographic transition would result in higher exports of goods and services and smaller migratory flows. Policymakers should focus on channeling policies and laws in terms of reducing the "brain drain" by creating better potential for young people to stay in the country. Fertility rates as a result of bigger income will increase respectively, as the paper shows there is a correlation between GDP, fertility, and child mortality rates.

In conclusion, Serbia's demographic transition, characterized by declining fertility rates, and child mortality rates which are still not decreasing, has significant economic implications that are interconnected with the country's economic situation, labor market, healthcare system, and overall socio-economic development. Proactive and integrated policy responses are essential to address these challenges, capitalize on the opportunities presented by demographic aging, and ensure sustainable economic development, prosperity, and well-being for all citizens.

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SOVEREIGN CREDIT RATING PREDICTION USING DATA MINING CLASSIFICATION TECHNIQUE

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***Abstract**: Before approving loans or buying securities, investors analyze the sovereign credit rating of a country that shows its ability to fulfill obligations. This information plays an important role for both, the debtor and the creditor. Calculation of this rating is performed by specialized agencies that provide their opinions based on appropriate information. It is expressed in the form of different categories and their calculation models are not publicly available. A country's credit rating shows how likely it is that the country will fulfill its obligations as a debtor on time. There are a lot of different opinions about the indicators that determine credit ratings and methods of their calculation. As data mining finds application in the economic sphere, the question is how successful are algorithms in determining country's credit rating. The aim of this paper is to use the data mining classification technique on selected data sets in order to predict sovereign credit rating. The methods used in this paper are Naive Bayes, k-nearest neighbours, decision tree and random forest. Evaluation measures of the models are presented and interpreted.*

***Key words**: data mining, classification, prediction, sovereign credit rating, credit rating agencies, financial markets*

JEL classification: E17, C53, B22

1. INTRODUCTION

In modern business conditions, one of the main goals of the investor is to reduce financial risk when creating an investment portfolio. This feature is also relevant in the area of international loans. In order to reduce the risk, it is necessary to gather as much information as possible about potential debtors. One of the important indicators is the sovereign credit rating, which is calculated and determined by specialized financial institutions. An appropriate category is assigned to a country as a result of a calculation based on different determinants. The determinants and methods of calculation are not publicly available. It is in the interest of every national economy to acquire the most attractive category of credit rating, which further provides an opportunity for more diverse sources of financing and economic activities. As data mining finds its application in the economic field, the question arises whether it is possible to determine the credit rating with the help of classification techniques and how successful are they in that task. To answer this question, two datasets with identical independent variables (attributes or determinants) were formed. Only difference between them is in the output variable (label) which represents the credit rating class of the company whose calculation is included in the data set. In this paper, 10 different indicators that are considered to have an impact on credit rating calculation were selected. Those are: Gross domestic product (GDP), GDP growth, GDP per capita, unemployment, inflation, public debt/GDP, corruption, fiscal balance, political stability and external balance. The first dataset shows the credit rating assigned by Standard & Poor's (S&P), while the second data set refers to Moody's company and its credit rating. Identical classification methods were applied to these two datasets (Naive Bayes, k-nearest neighbors, decision tree and random forest). Models were validated using accuracy, recall and false positive rate and the obtained results were presented and interpreted. A comparative analysis of the obtained results was also performed in order to

determine which classification method had the greatest success.

2. SOVEREIGN CREDIT RATING AND CREDIT RATING AGENCIES

One of the options that countries use when obtaining financial funds are foreign loans. In this way, they provide an opportunity to pay current obligations or invest in the development and other projects. Recently, especially in the past three decades, government debt has been growing all over the world (Cecchetti, Mohanti, & Zampolli, 2011). As a negative stimulus, financial crisis has significantly contributed to the growth of this trend.

In order for countries to raise funds through borrowing, they need to access the international capital market. One of the main conditions for a successful performance in this market is the presentation of a credit rating, which shows the country's ability to settle its debt obligations on time. It can also be defined as "the ability and willingness of sovereign governments to repay existing and future commercial debt obligations on time and in full" (Fuchs & Gehring, 2013). For this reason, potential investors take this indicator into consideration when making a decision. It largely determines the conditions under which countries, especially developing ones, can raise funds on the international capital market. Credit rating agencies (CRAs) are independent and they estimate country's credit ratings by gathering information from a variety of sources. Based on them, the risk of non-fulfillment of obligations is determined, which is calculated in the form of a category marked with a letter (Kruck, 2011). The indicator itself is the basis of an important and often unpleasant relationship between countries that want to obtain funds in the international capital market and the agencies that determine the ability of countries to enter this market (Tennant & Tracei, 2016). However, this reduces the asymmetry of information between the creditor and the debtor. There are a large number of credit rating agencies in the world but the three most famous are US-based S&P, Moody's and Fitch. In addition to assigning credit ratings to the countries, their activity is to assess the risk of bonds and other debt instruments. This paper analyses credit ratings calculated by two companies, S&P and Moody's.

The S&P company was founded in 1860. by Henry Varnum Poor in order to help investors who wanted to invest in the railway industry by publishing a "History of Railroads and Canals in the United States". With further development, it became a credit rating agency bought by McGraw-Hill in 1966. With over 160 years of work history, the company deals with data processing and delivery of information that enables other companies, governments and individual investors to make the right business decisions. Headquarter is in New York (S&P, 2022).

Moody's Corporation is a global company for integrated risk assessment. John Moody founded Moody's in 1900. through the publication of the Moody's Manual of Industrial and Miscellaneous Securities. Moody's employs over 13,000 employees in more than 40 countries. They have been in business for over 100 years with the mission of providing reliable insights and standards that help decision makers do business with confidence (Moody's, 2022).

Table 1. Credit risk classification by S&P and Moody's - Investment-grade ratings

Interpret.	**Moody's**		**Standard and Poor's**	
	Long-term	**Short-term**	**Long-term**	**Short-term**
Highest credit quality	Aaa		AAA	
High credit quality	Aa1 Aa2 Aa3	Prime-1	AA+ AA AA-	A1+
Strong payment capacity	A1 A2 A3	Prime-2	A+ A A-	A1
Adequate payment capacity Last rating in investment-grade	Baa1 Baa2 Baa3	Prime-3	BBB+ BBB BBB-	A2 A3

Source: Elkhoury, 2008

Table 2. Credit risk classification by S&P and Moody's - Speculative-grade ratings

Interpret.	**Moody's**		**Standard and Poor's**	
	Long-term	**Short-term**	**Long-term**	**Short-term**
Speculative Credit risk developing, due to economic changes	Ba1 Ba2 Ba3		BB+ BB BB-	B
Highly speculative, credit risk present, with limited margin safety	B1 B2 B3	Not prime	B+ B B-	

Interpret.	Moody's		Standard and Poor's	
	Long-term	Short-term	Long-term	Short-term
High default risk, capacity depending on sustained, favourable conditions	Caa1 Caa2 Caa3		CCC+ CCC CCC- CC	C
Default, Although prospect of partial recovery	Ca,C		C,D	D

Source: Elkhoury, 2008

Table 1. and 2. are shoing different classes of credit ratings that are calculated by the two companies for short-term and long-term loans. In this paper, long-term classes are analyzed. Moody's has 21 different classes expressed as a combination of uppercase and lowercase letters A, B and C with numerical designations 1, 2 and 3. S&P has 22 different categories with the letters A, B, C and D and the symbols "+" and "-" which show a tendency to move to a category above or below. In both agencies, class A is reserved for a high credit rating, B for an adequate one, and C for the one with the highest risk, with S&P also having a D mark for this category.

3. DATA MINING APPLICATIONS IN FINANCIAL MARKETS – LITERATURE REVIEW

Data mining is the process of collecting, processing, analyzing and obtaining usable insights from a data set. Observing different variants in the field of problem solving, practical application, formulation and presentation of data, this broad term seeks to explain different aspects of data processing. Data mining is gaining in importance in the modern age where automated systems provide a large amount of data for further processing (Aggarwal, 2015).

Data mining involves the use of statistical and machine learning methods that provide decision-making assistance, often in an automated way. As part of it, prediction is an important component. Instead of asking "what is the connection between advertising and sales?", there is often a greater interest in answering the question "which specific advertisement or product should be presented to the online consumer at the moment?". Also e.g., there is an interest in grouping customers in appropriate clusters which represent the basis of product offer differentiation. Data mining methods have the ability to automatically extract value from a large amount of data. Classification and prediction are performed through a large number of different methods, and each of them has advantages and disadvantages. They provide different results and their performance varies. For this reason, different methods are applied to solve the same problem in order to select the one that achieves the best results (Shmueli, Bruce, & Patel, 2016).

The variables in a data set are called attributes. In general, there are two types of data that are treated differently. The first type refers to a specially designated attribute where the goal is to predict its value for unseen instances. This type of data is called a label. Data mining with such data belongs to supervised learning. The two main tasks in this type of learning are called classification and regression. Classification is used for categorical attributes (such as very good, good, bad, etc.), while regression is used for numerically expressed attributes. For unlabelled attributes, data mining refers to unsupervised learning. Here, the goal is to extract as much useful information as possible from a given data set (Bramer, 2016).

The classification technique is used to determine the output label for unlabeled data in the test part of the data set, based on data from the another part related to algorithm training. It is also the most commonly used technique in data mining (Aggarwal, 2020).

Data mining finds application in various fields, especially in economics. As financial markets and business activities are driven by the movements of various factors, perfect time information provides an advantage in making business decisions at all levels. Data mining, which provides this type of information, plays a significant role in this process. It can find connections between features and create models that deal with predictions based on a wide range of data. Using historical data things like short-term exchange rates, interest rates and stock prices can be predicted (Hiľovská & Koncz, 2012).

Although not an easy task, predicting stock market prices and financial market movements has always attracted a large number of data science researchers. Their rise or fall are phenomena that investors seek to estimate when investing. One of the most widely used data mining techniques to solve this problem are neural networks with the basic assumption that similar input data after processing gives similar output data while ignoring daily fluctuations. Text mining also helps to predict stock price movements. Schumaker and Chen developed a

model that downloaded S&P500 stock price news via the Yahoo finance platform to predict price movements 20 minutes into the future (2009). For solving this problem inference rules, statistical analysis, genetic algorithms, and data visualization were also used (Zhang & Zhou, 2004).

Data mining also provides assistance in portfolio management, i.e., in the selection of different types of securities and the distribution of available financial resources for their acquisition. The main goal is to choose their adequate combination that maximizes income while minimizing risk. To solve this problem, various data mining models based on neural networks, hidden Mark model, etc., have been developed. (Hariharan, 2018).

Globalization is forcing countries to liberalize their individual markets in order to attract foreign investment. Exchange rates are gaining importance as economic entities begin to operate multinationally. Forecasting the movement of exchange rates is used when making important business decisions because their fluctuations take place on a daily basis. Buying currencies at a lower price and selling them at a higher price is the main goal in the currency market. For this purpose, data mining models based on neural networks (especially multilayer perceptron) and various statistical techniques have been developed (Hariharan, 2018).

Zhang and Zhou wrote about the application of data mining in the analysis of borrowed capital risk. They forecasted the payment of debt, estimating the value of mortgages in the provision of services related to real estate and international currency trading (2004). In addition to the above examples, data mining can also be used in fraud detection, pattern recognition, anomaly detection, social media analysis and other activities that can provide assistance in business activities in financial markets.

When it comes to credit rating prediction, Ozturk, Namli and Erdan (2016) used classification and regression trees (CART), multilayer perceptron, support vector machines, Bayesian network and the Naive Bayes algorithm to determine Moody's credit rating for the period 1999-2010. The set consisted of 8 variables (financial balance, GDP balance, debt-to-GDP, GDP per capita, GDP changes, inflation, import-export ratio and government efficiency) and included 1,022 observations, or 92 countries. Compared to conventional statistical methods, their models provided over 90% accuracy with a tolerance of one or two notch deviations.

4. DATA SETS

Two data sets were used in this analysis. They contain identical variables for credit rating determination. The only difference between these two data sets is in the credit rating column itself, where the first set includes classes assigned by S&P and the second by Moody's company. The same data mining methods will be applied on them so that the results can be compared and interpreted. It is important to note that the number of instances is not the same because companies provide credit ratings for only certain countries. All attributes were collected for the 2020. year, while the credit rating is from 2021. The models did not take historical credit rating data over a long period of time. The goal is to predict the credit rating in 2021. based on the data for the previous year. It is important to note that the global market was affected by the COVID-19 pandemic.

4.1. ATTRIBUTE SELECTION

As the calculation models and determinants for sovereign credit rating determination are unknown to the public, a large number of authors have addressed this issue such as Canton and Packer (1996), Tennant and Tracey (2016), Iyengar (2012), Sheng-Syan, Hsien -Yes. (2016), Wei Chee, Fan Fah and Nassir (2015) as well as many others. They categorized the determinants and formed their opinions based on the information given by the credit rating agencies. Based on the analysis of individual papers and written materials, the following most common attributes were selected for the data set.

Table 3. shows 11 attributes including the label. For each attribute, a link and source are provided through which the downloaded data can be accessed, as well as detailed information about what they actually represent. The last column shows the units in which attributes are expressed. All units are numeric except for the label, which is a combination of letters and numbers or symbols, depending on the rating agency. After eliminating countries with missing data, two data sets were formed. S&P data set has 95, while Moodi's data set has 104 instances (different countries). Moody's data set contains all of the instances that are in the S&P set, and in addition it has 9 countries more. The S&P set has 19 different values (classes) of credit rating, while Moody's has 21 different values.

Table 3. Data set attributes

No.	Attribute name	Source	Link	Units
1.	GDP	Trading economics	https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?most_recent_year_desc=false	USD
2.	GDP growth	World bank	https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG	%
3.	Unemployment	World bank	https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?most_recent_year_desc=false	%
4.	Inflation	World bank	https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG	%
5.	GDPper capita	World bank	https://data.worldbank.org/indicator/NY.GDP.PCAP.CD	USD
6.	Public debt / GDP	Trading economics	https://tradingeconomics.com/country-list/government-debt-to-gdp	%
7.	Corruption	Trading economics	https://tradingeconomics.com/country-list/corruption-rank	Rank
8.	Fiscal balance	World bank	https://www.theglobaleconomy.com/rankings/fiscal_balance_percent_GDP/	%
9.	Political stability	The global economy	https://www.theglobaleconomy.com/rankings/wb_political_stability/	Index (from -2.5 to 2.5)
10.	External balance/ GDP	World bank	https://data.worldbank.org/indicator/NE.RSB.GNFS.CD	USD
11.	Credit rating	Trading economics	https://tradingeconomics.com/country-list/rating	Classes

Source: Collected data from different online sources and aggregated by author

5. DATA ANALYSIS

The open source WEKA data mining tool with version 3.8.6 was used in the analysis process. This tool enables the application of classification techniques and the validation of the obtained results provided by the models. The analysis was performed first on the Moody's, and then on the S&P data set. The k-fold cross-validation method was used to divide the set into a training part and a part for model testing. This method involves dividing a data set of N instances into *k* equal parts (subset). If the number N is not divisible without the remainder by the number *k*, then the last part has a smaller number of instances than the others. Each individual part is used for testing, while the others are used for training (Brammer, 2016). As S&P and Moody's data sets do not have a large number of instances, this method reduces bias in testing and training overall. In the analysis process, the data set is divided into 10 subsets, which means that testing in the WEKA tool is performed for each subset and once again for the whole data set (11 times in total).

In order to predict the credit rating class, the following classification methods were used in the analysis process: Naïve Bayes, decision tree, k-nearest neighbors (k-NN) and random forest.

Naïve Bayes uses probability theory for solving classification problems. It was named after Reverend Thomas Bayes (1702-1761) who was credited as the first mathematician to use probability in an inductive way. In classification, there is a set of alternative possible events, which are mutually exclusive and exhaustive, indicating that only one must always occur. Each of probabilities has to be between 1 and 0, and their sum has to be 1. Events are instances that have only one specific classification label. The training part of the data set contains a sample of trials that are used for predicting the classes of unseen instances. If set has *k* mutually exclusive classifications c_1, c_2,..., c_k, which have prior probabilities $P(c_1)$,$P(c_2)$,..., $P(c_k)$, and *n* attributes a_1,a_2,...,a_n which for a given instance have values v_1,v_2,...,v_n respectively, the posterior probability of class c_i can be calculated as:

$$P(c_i) \times P(a_1=v_1|c_1) \times P(a_1=v_1|c_1) \times \ldots \times P(a_n=v_n|c_n)$$

Product is calculated for each value of *i* from 1 to *k* and the classification which has the largest value is chosen (Brammer, 2016).

Decision tree is one of the most popular classification method in data mining. It starts from

the root and consists of nodes and leaves. Every internal node has a splitting rule which divides data set based on attributes and sends data item to the node's children. This process is repeated until data reaches the leaf node which represents the predicted label class. Trees can also be pruned by getting shorter but maintaining similarclassification accuracy. They can use numerical or categorical attributes (Aggarwal, 2020).

Nearest Neighbour Classification can be used in both cases, when attribute values are continuous and categorical. If they are categorical, they need to be modified for this kind of use. The class of an unseen instance is determined by class of instances that are closest to it. In most cases, a small integer number of instances *k* is chosen to determine the class of an unseen one. The name of this method is *k-Nearest Neighbour* or *k-NN*. The basic k-NN algorithm finds *k* training instances with the smallest distance to the unseen instance and takes the most commonly occurring class of these *k* instances. The most popular methods used for the calculation of distance measures are Euclidian Distance, Manhattan Distance or City Block Distance and maximum dimension distance (Brammer, 2016).

Random Forest classifier is a combination of decision tree algorithms where each one is generated using a random vector and each tree votes for the class of the input vector. It consists of a large number of individual decision trees in the form of anensemble. Each tree predicts the class and a class with most votes represents the predicted label (Breinman, 2001). Random forest is described as a basic bagging method applied to decision trees involving training of each tree on a different part (subset) of the data set (Aggarwal, 2020).

Accuracy, recall and false positive rate were used to validate the models. They are calculated based on the confusion matrix as follows:

$$Accuracy = \frac{TP+TN}{TP+TN+FP+FN}$$

$$Recall = \frac{TP}{TP+FN}$$

$$FPR = \frac{FP}{FP+TN}$$

When there are more than two classes in the selected data set, in the confusion matrix one class becomes positive while all the others are counted as negative. The confusion matrix consists of:

- TP (true positives) represents the number of positive instances that are classified as positive,
- TN (true negatives) the number of negative instances that are classified as negative,
- FP (false positives) number of negative instances that are classified as positive and
- FN (false negatives) number of positive instances that are classified as negative.

The accuracy of a classifier represents the percentage of instances that are correctly classified, recall of the model shows the percentage of correctly classified positives (TP) in the total number of positive instances, while FPR shows the percentage of negative instances that are incorrectly classified as positive (Brammer, 2016). Precision and F-score are not calculated due to the large number of different classes of the output attribute and the small number of samples in the set.

6. RESULT

The research results are presented in table form. The names of the methods are included together with the selected validation measures. First, the validation measures of the models applied to the Moody's data set are presented and interpreted. After that, the same procedure was applied to the S&P data set.

6.1. VALIDATION MEASURES OF METHODS APPLIED ON MOODY'S DATA SET

Table 4. shows the validation measures of methods applied to the Moody's data set. Observing the obtained results of the applied methods at the Moody's set, a generally low level of accuracy can be noticed.

Table 4. Evaluation of the models applied on Moody's data set

Method	Accuracy	Recall	FPR – false positive rate
Naive Bayes	16,35%	0,163	0,067
k-NN	15,38%	0,154	0,055
Decision tree	13,46%	0,135	0,061
Random forest	20,19%	0,202	0,058

Source: Authors' calculation

The highest accuracy of 20.19% was achieved with the random forest method, while the lowest accuracy was achieved with the decision tree method (13.46%). Model recall reached its highest level again in the random forest method (20.2%), while the decision tree algorithm had the lowest level (13.5%). FPR was highest at Naive Bayes (6.7%), while it was lowest in the k-NN method (5.5%).

6.2. VALIDATION MEASURES OF METHODS APPLIED ON S&P DATA SET

Table 5. shows the validation measures of the S&P data set methods. As in the previous case, the applied methods on the S&P data set also gave a low level of accuracy.

Table 5. Evaluation of models applied on the S&P data set

Method	Accuracy	Recall	FPR – false positive rate
Naive Bayes	22,11%	0,221	0,061
k-NN	21,05%	0,211	0,055
Decision tree	16,84%	0,168	0,061
Random forest	25,26%	0,253	0,057

Source: Authors' calculation

The highest accuracy was provided by the random forest algorithm (25.26%), while the lowest accuracy was provided by the decision tree method (16.84%). Model recall was highest again in the random forest method (25.3%), while it was lowest in the decision tree algorithm (16.8%). The Naive Bayes and random forest methods have the same FPR (6.1%), while the k-NN method has the lowest (5.5%).

In both analyzed sets, the highest level of accuracy was achieved by the random forest method, while the lowest was achieved by the decision tree algorithm. The recall of the model was also the highest in the random forest method at both data sets, and the lowest with the decision tree method. FPR was lowest with the k-NN method in both data sets, while it was highest with the Naive Bayes method with the same level of FPR achieved in the S&P data set with the decision tree algorithm.

CONCLUSION

The highest accuracy (S&P 20.19% and Moody's 25.26%) and model recall in both data sets was achieved by the random forest method. All selected models achieved a generally low level of accuracy, FPR and model recall. This shows that they are not very successful in prediction of credit ratings, which further implies that the included variables do not sufficiently explain the assigned classes. This is also understandable because credit agencies include many more indicators compared to the number of attributes included in the models. In addition, one of the reasons is the short time period for which data was collected, only one year (2020), which implies that a period of one year is not enough to determine the credit rating class through the data mining classification technique. The large number of different credit rating values (classes) for a small number of instances affect the accuracy of the applied models.

Comparing the results obtained over the two selected data sets, methods were more successful in the S&P credit rating data base, meaning that the selected variables better explain the credit rating assigned by this company than by Moody's. One of the issues that arises and potentially explains the achieved results of the models is the potential bias of credit agencies in determining ratings.

One of the ways to increase the accuracy of the models is to reduce the classes to basic without subcategories, i.e. to A, B, C or A, B, C, D depending on the selected credit rating agency. This would significantly reduce the number of different label values. Future research may include observed variables over more time or add some new ones that deeply explain the sovereign credit rating, as well as new applied data mining techniques.

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THE IMPACT OF CRYPTOCURRENCIES ON TRADITIONAL FINANCIAL MARKETS

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Abstract*: The paper examines the impact of cryptocurrencies on financial markets. The analysis is based on monthly data for the period 2019-2023. Kendall's and Spearman's correlation analysis methods were applied to investigate the relationship between cryptocurrency prices and traditional financial instruments. The variables used in the analysis include the prices of Bitcoin, Ethereum, and BNB, gold, crude oil, and the MSCI World Index. The correlation analysis, employing Kendall's and Spearman's correlation coefficients, decisively refutes the null hypothesis of the absence of a statistically significant relationship between cryptocurrency prices and those of traditional financial instruments. Notably, the findings underscore significant and positive correlations between Bitcoin, Ethereum, and BNB prices, and those of crude oil, gold, and the MSCI World Index. According to the results of the VAR analysis and Granger Causality test, a causal relationship can be confirmed in one direction from Bitcoin to crude oil, but not vice versa. Additionally, there is a one-way causal relationship from the MSCI World Index to the price of Ethereum. Furthermore, there are bidirectional causal relationships in most interactions among the selected cryptocurrencies.*

Keywords*: Bitcoin 1, Etherium 2, BNB 3, GOLD 4, OIL 5, MSCI World Index 6.*

JEL classification: C10, C32, C50, G10

1. INTRODUCTION

Over the past few years, the cryptocurrency market has undergone significant changes. These changes have had an impact on the dynamics of traditional financial markets, leading to a growing interest in exploring the relationships and trends between them. This research aims to investigate how cryptocurrencies are affecting traditional financial markets by analyzing the correlation between cryptocurrency prices and the prices of traditional financial instruments. By using Kendall's and Spearman's correlation analysis and comparing the volatility of each variable, we hope to gain a better understanding of how cryptocurrency markets and traditional financial markets interact.

The paper is segmented into three parts. The first part discusses the theoretical framework based on previous research on the implications of cryptocurrencies on traditional financial markets. The second section provides a detailed description of the variables used in the study along with descriptive statistics. The fourth section presents the results of the data normality tests and correlation analysis. The fifth part of the paper encompasses the results obtained through VAR analysis and the Granger Causality Test. Finally, the last section of the paper includes concluding remarks and potential directions for future research.

2. THEORETICAL FRAMEWORK

With the advancement of technology, the cryptocurrency market has developed, but cryptocurrencies are still not widely accepted as legal tender and cannot threaten the stability of some major international currencies (USD, EURO). However, further technological development could lead to an increase in the popularity and use of cryptocurrencies, potentially resulting in their concurrent use with other official currencies in the market. This poses risks to the monetary policies of central banks (Claeys,

Demertzis, & Efstathiou, 2018). The emergence of cryptocurrencies and the growth of their popularity have raised questions about their potential impact on traditional financial markets. There are conflicting opinions about whether these markets are interconnected (Wang, Zhang, Li, & Shen, 2019).

Supply and demand factors have a significant impact on Bitcoin, with demand factors being crucial. However, the research findings of Jakub (2015) do not support previous findings regarding the impact of certain global and financial factors and investor speculation on the price of Bitcoin. Although cryptocurrencies are attractive for investment, they have several differences compared to fiat money and financial instruments. The main drawback is the high market volatility, which makes it difficult to predict its exchange rate. Therefore, compared to official legal currency, cryptocurrency cannot serve as a means of savings or payment (Mikhaylov, 2020).

The interaction between cryptocurrency prices and the prices of gold and crude oil was analyzed by Asena Deniz & Teker (2020). Daily data from April 3, 2018, to December 31, 2020, was utilized. The results of this analysis showed that the prices of gold and crude oil do not have a strong influence on cryptocurrency prices. In the study by Erdas & Caglar (2018), an asymmetric causal relationship between Bitcoin and gold, crude oil, the US dollar, the S&P 500, and BIST 1000 indexes was analyzed using weekly data from 2013 to 2018. The results indicated that the only causal relationship exists was one-way for Bitcoin prices towards the S&P 500 Index. However, the authors failed to prove a causal relationship between Bitcoin and the other included variables. From January 2020 to October 2022, Wątorek, Kwapień & Drożdż (2023) analyzed the correlation between the cryptocurrency market (Bitcoin and Ethereum) and traditional financial markets (such as stock indexes, Forex, and commodities). The results of the study indicate that since the onset of the COVID-19 crisis in March 2020, the dynamics of Bitcoin and Ethereum prices have become dependent on prices in traditional financial markets, and cryptocurrency prices also react to inflation similarly to traditional financial instruments. The influence of fundamental economic indicators on the virtual financial asset market and the possibility of using cryptocurrencies as assets were examined by Baranovskyi, Kuzheliev, Zherlitsyn, Serdyukov, & Sokyrko (2021). The analysis was based on US fundamental economic indicators data from 2014 to 2021. Through correlation and multiple regression analysis, the results indicate that cryptocurrencies can be an effective investment tool, offering high returns and high variability. Additionally, there is a significant impact of stock and financial market prices on cryptocurrency prices. Bitcoin can become a new global currency and influence the future movements of some world currencies, such as the US dollar, euro, or Chinese yuan. However, in its current form, it cannot have significant implications for the US dollar. The main reason is that the regulation of Bitcoin is a major obstacle, as is its limited supply of 21 million units. The authors employed SEM technique for simultaneously testing and estimating causal relationships among multiple independent and dependent constructs. For uncovering the underlying structure of five key variables in the initial set of 30 respondents, they used EFA with ADANCO 1.1.1. Later, they applied CFA for 193 respondents (Seetharaman, Saravanan, Patwa, & Mehta, 2017).

Nam (2023) investigated the impact of cryptocurrencies on financial markets using a multiple linear regression model. The analysis included variables such as exchange rates, gold prices, crude oil prices, and stock indices. Over the period from 2014 to 2021, the results of this analysis indicate that cryptocurrencies have an impact on the financial market, with an inverse effect of currency pairs on cryptocurrencies and interaction among different cryptocurrencies. According to Trabelsi (2018), there are no significant spillover effects between cryptocurrency markets and traditional financial markets. The results of his research also indicate that cryptocurrencies are weakly integrated into the global financial market. The findings of Kim (2022) suggest that the cryptocurrency market is connected to the traditional financial market through reserve-backed stablecoins. Using the Pearson correlation coefficient, Ariya, Chanaim, & Dawod (2023) examined the impact of the COVID-19 pandemic on the relationship between the market prices of some traditional financial instruments and cryptocurrency prices. The results of the study indicate a direct impact on the movement of cryptocurrency prices as well as on the traditional financial market in Thailand from 2019 to 2022. Moreover, correlations have a stronger connection in the case of digital assets compared to traditional ones.

3. METHODOLOGICAL FRAMEWORK

The research covers the period from 2019 to 2023 and uses monthly data on the prices of three key cryptocurrencies: Bitcoin, Ethereum, and BNB. The data were collected from the leading website, CoinMarketCap (2024). Regarding traditional financial markets, data on the prices of crude oil, gold, and the MSCI World Index were used,

collected from the website Macrotrends (2024). The MSCI World Index provides a measure of the profitability of large and medium-sized companies worldwide, providing insight into global trends in financial markets.

First, a descriptive analysis of the selected variables was conducted, as shown in Table 1. Based on the results of descriptive statistics, it can be concluded that the maximum price of bitcoin during the analyzed period from 2019 to 2023 was $60,352 in October 2021. According to the calculated standard deviation, the highest volatility was present in Bitcoin prices as well as in the price of gold. The maximum price of gold was $65,477.41 in July 2020. The lowest volatility among the variables analyzed was observed in the price of oil throughout the analysis period.

Through the Kolmogorov-Smirnov and Shapiro-Wilk tests, an assessment of data normality was conducted. According to the results shown in Table 1, based on the Kolmogorov-Smirnov test for the variables Bitcoin, Ethereum, BNB, and GOLD, the null hypothesis can be rejected, confirming that the data is not normally distributed, as the p-value is less than the accepted significance level of 0.05.

For the variable MSCI IDX, the null hypothesis can also be rejected. Similar results were obtained through the Shapiro-Wilk test, indicating that the p-value is lower than the accepted significance level for the variables Bitcoin, Ethereum, BNB, GOLD, and MSCI IDX, while for the variable OIL, the p-value is higher than the accepted significance level, standing at 0.905, indicating that according to this test, only in the case of the OIL and MSCI IDX variables are the data normally distributed.

Table 1. Descriptive Statistics

	Min.	Max.	Sum.	Mean.	Stand. dev.
BIT	3604.69	60352.00	1464881.55	24414.6925	15444.99148
ETH	108.90	4132.17	82786.14	1379.7690	1115.63154
BNB	6.17	591.20	11919.85	198.6642	167.44907
GOLD	41492.95	65477.41	3382875.93	56381.2655	6602.98886
OIL	18.84	114.09	4026.66	67.1110	20.73892
MSCI	1852.73	3370.00	157432.83	2623.8805	410.05016

Source: Author's calculation

Table 2. Test of Normality

Variables	Kolmogorov-Smirnov test		Shapiro-Wilk test	
	Statistic	Sig.	Statistic	Sig.
Bitcoin	0,135	0,008	0,934	0,003
Ethereum	0,175	0,000	0,898	0,000
BNB	0,238	0,000	0,872	0,000
Gold	0,131	0,012	0,909	0,000
Oil	0,055	0,200	0,990	0,905
MSCI IDX	0,110	0,069	0,952	0,020

Source: Author's calculation.

After checking the normality of the data distribution using the Shapiro-Wilk test, it was concluded that the data did not adhere to the assumption of a normal distribution. Given this characteristic of the dataset, it was decided to use Kendall's and Spearman's correlation coefficients to assess the relationship between cryptocurrency prices and selected traditional financial instruments. These coefficients are a suitable choice because they do not require assumptions about the normality of the data distribution, ensuring their applicability in situations where the data deviates from a normal distribution.

4. CORRELATION ANALYSIS

Based on the obtained results of the normality tests using Kendall's and Spearman's correlation coefficients, a detailed analysis of the relationship between the prices of cryptocurrencies Bitcoin, Ethereum, and BNB, and the prices of traditional financial instruments such as crude oil, gold, and the MSCI World Index was conducted. These coefficients will provide insight into the degree of correlation between these variables, contributing to a deeper understanding of the interactions between cryptocurrencies and traditional financial markets during the analyzed period. The hypotheses outlined in the study are as follows:

H0: There is no statistically significant relationship between the prices of cryptocurrencies (Bitcoin, Ethereum, BNB) and the prices of crude oil, gold, and the MSCI World Index.

H1: There is a statistically significant relationship between the prices of the mentioned cryptocurrencies and the prices of the mentioned traditional financial instruments.

According to the presented results of the correlation analysis using Kendall's coefficient, the alternative hypothesis can be confirmed, meaning that there is a statistically significant relationship between the prices of Bitcoin, Ethereum, and BNB with the prices of gold, crude oil, and the MSCI World Index. It is important to note that the relationship between the prices of selected cryptocurrencies and the prices of traditional financial instruments is a positive correlation, as all obtained coefficients are in a positive sign (Table 3). Additionally, the obtained p-value is at the level of statistical significance of 0.01. According to Spearman's coefficient (Rho), the correlation matrix indicates that the null hypothesis can be rejected, and there is a statistically significant relationship between the prices of cryptocurrencies and the prices of gold, crude oil, and the MSCI World Index. The correlation relationship is even stronger according to Spearman's coefficient compared to Kendall's (Table 4).

Table 3. Correlation analysis - Kendall

Variables		BIT	ETH	BNB	GOLD	MSCI	OIL
BIT	Coeff.	1,000	0,820**	0,707**	0,350**	0,693**	0,323**
	Sig.		0,000	0,000	0,000	0,000	0,000
ETH	Coeff.	0,820**	1,000	0,779**	0,410**	0,738**	0,396**
	Sig.	0,000		0,000	0,000	0,000	0,000
BNB	Coeff.	0,707**	0,779**	1,000	0,297**	0,604**	0,468**
	Sig.	0,000	0,000		0,001	0,000	0,000
GOLD	Coeff.	0,350**	0,410**	0,297**	1,000	0,490**	0,213*
	Sig.	0,000	0,000	0,001		0,000	0,016
MSCI	Coeff.	0,693**	0,783**	0,604**	0,490**	1,000	0,280**
	Sig.	0,000	0,000	0,000	0,000		0,002
OIL	Coeff.	0,323**	0,396**	0,468**	0,213*	0,280**	1,000
	Sig.	0,000	0,000	0,000	0,016	0,002	

***** Correlation is significant at the 0,01 level (2-tailed).***
**** Correlation I significant at the 0,05 level (2-tailed).***
Source: Author's calculation.

Table 4. Correlation analysis - Spearman

Variables		BIT	ETH	BNB	GOLD	MSCI	OIL
BIT	Coeff.	1,000	0,940**	0,867**	0,534**	0,875**	0,551**
	Sig.		0,000	0,000	0,000	0,000	0,000
ETH	Coeff.	0,940*	1,000	0,927**	0,602**	0,890**	0,647**
	Sig.	0,000		0,000	0,000	0,000	0,000
BNB	Coeff.	0,867**	0,927**	1,000	0,468**	0,789**	0,707**
	Sig.	0,000	0,000		0,000	0,000	0,000
GOLD	Coeff.	0,534**	0,602**	0,468**	1,000	0,689**	0,316*
	Sig.	0,000	0,000	0,001		0,000	0,014
MSCI	Coeff.	0,875**	0,890**	0,789**	0,689**	1,000	0,475**
	Sig.	0,000	0,000	0,000	0,000		0,002
OIL	Coeff.	0,551**	0,647**	0,707**	0,316*	0,475**	1,000
	Sig.	0,000	0,000	0,000	0,014	0,000	

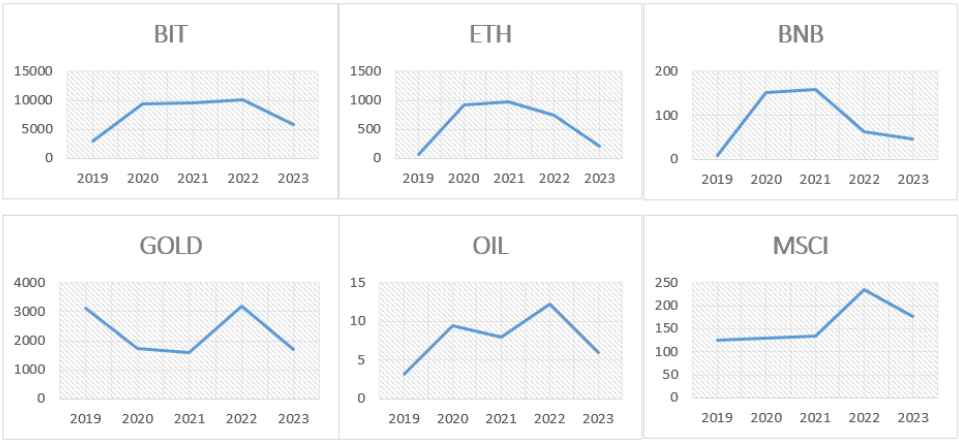
***** Correlation is significant at the 0,01 level (2-tailed).***
**** Correlation is significant at the 0,05 level (2-tailed).***
Source: Author's calculation.

The volatility of cryptocurrency prices and the prices of traditional financial instruments is calculated using the standard deviation. Based on Graph 1, it can be observed that there is a decrease in volatility for all analyzed variables. In the case of Bitcoin, a decrease in volatility is observed from the year 2022. For Ethereum, it is noted that the volatility of prices shows a gradual decrease from the year 2021, followed by a more intense decline from the year 2022. The price of BNB records a drastic decrease in volatility from the year 2021, followed by a milder decline from the year 2022. An interesting fact about the volatility of gold prices is that from the year 2021 to 2022, there is a drastic increase in volatility followed by a steep decline from the year 2022 to 2023.

The price of crude oil records a significant decrease in volatility from the year 2022. The MSCI World Index shows an increase in volatility from 2021 to 2022, followed by a milder decline in the last year of 2023. Therefore, although there has been a decrease in volatility in the prices of cryptocurrencies and traditional financial instruments, there is a difference in whether this occurred in 2021 or 2022. What is evident is that in the last year of 2023, there was a decrease in volatility for all analyzed variables.

However, although there is an evident decrease in volatility across all observed variables, it is important to highlight which variables had the highest volatility each year.

Graph 1. The volatility of the cryptocurrency market and traditional financial market



Source: Author's calculation.

Table 5. Volatility 2019-2023

	Bitcoin	Ethereum	BNB	Gold	Oil	MSCI IDX
2019	2917.75	60.72321	9.33681	3111.08	3.11407	125.40261
2020	9375.56325	926.28815	151.18313	1745.03514	9.4442	129.68762
2021	9482.60759	967.33633	157.81005	1602.74592	8.03186	135.31917
2022	10101.57449	743.57724	62.75407	3184.282	12.29753	235.37136
2023	5849.04533	218.1647	46.05434	1712.99851	5.95665	175.83301

Source: Author's calculation.

Based on Table 5, it can be concluded that in the analyzed period from 2019 to 2023, both in the cryptocurrency market and traditional financial markets, the lowest volatility was observed in 2019. When comparing variables from the cryptocurrency market and traditional markets, it is evident that there is higher volatility in the former. Within the cryptocurrency market, the highest volatility is observed in the case of Bitcoin, specifically in 2022. However, the prices of Ethereum and BNB cryptocurrencies recorded their highest volatility in 2021. In the case of traditional financial markets, the highest volatility is observed in the price of gold, while the lowest is observed in the price of crude oil. Additionally, it is noted that the highest volatility in this market was in 2022, similar to Bitcoin. The generalized conclusion is that in the last year of the analysis, 2023, volatility decreased in both observed

markets, but it remained higher compared to the initial analyzed year (2019).

5. VAR ANALYSIS

To conduct a time series analysis, it is crucial to first perform a stationarity test. Stationarity represents a fundamental assumption necessary for reliable interpretation of results and accurate forecasting of future values. If time series data is non-stationary, it can lead to unreliable analyses and inaccurate conclusions. In our research, the stationarity of all relevant variables, including the prices of Bitcoin, Ethereum, BNB, gold, crude oil, and MSCI_IDX, was examined using the Dickey-Fuller test (Dickey-Fuller, 1979). The results indicated that the time series were non-stationary at level, prompting us to apply differencing to achieve stationarity. The results of the Dickey-Fuller stationarity test are comprehensively presented in the attached Table 6.

Table 6. Dickey-Fuller test for unit root

	T-statistic	P-value
DBIT	-6,136	0,000*
DETH	-7,599	0,000*
DBNB	-8,487	0,000*
DGOLD	-8,961	0,000*
DOIL	-6,795	0,000*
DMSCI_IDX	-5,745	0,000*

1% significance level
Source: Author's

Based on the results presented in the table, we can conclude that all variables are stationary after applying first differencing. Additionally, the negative t-statistic values for all variables indicate the presence of negative correlation between the variables and their lagged values. The very low p-value obtained for all variables (0.000) suggests that the null hypothesis of the presence of a unit root in the time series is rejected with a high degree of confidence. In other words, the time series of the variables under consideration do not exhibit non-stationarity characteristics. To investigate the relationships and interactions among multiple variables over time, the use of a VAR (Vector Autoregression) model was chosen. Building a VAR model requires that all variables included in the analysis are stationary, which has been confirmed through the application of the Dickey-Fuller test. Stationarity is a key prerequisite for reliable time series analysis, enabling precise modeling of interdependencies and forecasting of future variable movements. We constructed a VAR model using Bitcoin, Ethereum, BNB, gold, crude oil, and MSCI_IDX as variables.

In order to estimate the VAR model, we investigated the optimal lag length using the Akaike, Schwarz, and Hannan-Quinn criteria, as well as the prediction error criterion. Based on these criteria, two periods seemed to be the optimal lag length. These findings served as the basis for specifying the VAR model, enabling us to effectively model the relationships among variables over time. Specifically, we examined stationary conditions after estimating the VAR model. This step holds significant importance for ensuring the reliability of our findings. In essence, when the inverse roots of the characteristic AR polynomial have a modulus of less than one and fall within the unit circle, the stability of the VAR model estimation is affirmed, and conversely. Upon examining the results concerning the Eigenvalue stability condition, we ascertain the stability of the VAR model, as all eigenvalues reside within the unit circle. These results serve to bolster the credibility of our statistical analyses and empower us to interpret the outcomes of our model with confidence. Subsequently, we checked for autocorrelation among the residuals. The Lagrange Multiplier test was then conducted to investigate whether there is autocorrelation at the selected lag. According to the results of this test, the null hypothesis cannot be rejected, confirming that there is no autocorrelation in the model at the selected lag of two periods. After conducting the tests, the Granger Causality Test was examined (Table 7). This test investigates whether lagged values of one variable help predict other variables in the model.

H0: X does not Granger Cause Y

H1: X Granger Causes Y

Rule of decision: if p-value is:

<0,05 = "X"Granger causes "Y" at the 5% significance level.

>0,05 = "X" does not Granger cause "Y" at the 5% significance level.

Table 7. Granger Causality Wald test

	chi2	df	prob>chi2
BIT→OIL	5,761	2	0,050**
OIL→BIT	0,591	2	0,744
BIT→GOLD	0,136	2	0,934
GOLD→BIT	0,557	2	0,757
BIT→MSCI_IDX	3,493	2	0,174
MSCI_IDX→BIT	3,272	2	0,195
ETH→OIL	1,293	2	0,524
OIL→ETH	0,614	2	0,736
ETH→GOLD	0,953	2	0,621
GOLD→ETH	0,518	2	0,772
ETH→MSCI_IDX	1,115	2	0,561
MSCI_IDX→ETH	7,180	2	0,028**
BNB→OIL	5,211	2	0,074
OIL→BNB	1,238	2	0,538
BNB→GOLD	2,042	2	0,360
GOLD→BNB	3,215	2	0,200
BNB→MSCI_IDX	2,127	2	0,345
MSCI_IDX→BNB	2,843	2	0,241
BIT→ETH	12,237	2	0,002*
ETH→BIT	3,262	2	0,196
BIT→BNB	26,453	2	0,000*
BNB→BIT	40,131	2	0,000*
ETH→BNB	7,529	2	0,023**
BNB→ETH	1,402	2	0,496

1% significance level
5% significance level
Source: Author's calculation.

Based on the results of the Granger Causality test, we observe that only a few variables exhibit mutual interactions. For instance, the price of Bitcoin, with a p-value of 0.05 at a significance level of 5%, can be useful in predicting future movements in the price of crude oil. Similarly, the movement of MSCI_IDX, with a statistical significance of 5%, can predict future movements in the price of Ethereum. We notice that there are more causal relationships in the cryptocurrency market, especially among the selected three cryptocurrencies. For example, at a significance level of 1%, the price of Bitcoin can predict future movements in the price of Ethereum, but not vice versa. In the case of variables Bitcoin and BNB, there is a causal relationship in both directions, with statistical significance of 1% (BIT→BNB) and 5% (BIT→BNB). Additionally, the price of Ethereum can be useful in predicting future prices of BNB, with a statistical significance of 5%. So, only in these interactions and causal relationships can we reject the null hypothesis, while in most others, we must accept the alternative hypothesis.

CONCLUSION

The correlation analysis, conducted using Kendall's and Spearman's correlation coefficients, clearly rejects the null hypothesis of no statistically significant relationship between cryptocurrency prices and prices of traditional financial instruments. Specifically, the results highlight statistically significant and positive correlations between the prices of Bitcoin, Ethereum, and BNB, and the prices of crude oil, gold, and the MSCI World Index. Despite the high volatility of the cryptocurrency market, this suggests its integration with traditional financial markets, which may be of interest to investors for portfolio diversification and risk management purposes. Finding a significant interaction between these diverse asset classes implies that macroeconomic factors could simultaneously affect both sectors, warranting further research to better understand the causes and mechanisms of these connections. At the 1% significance level, the price of Bitcoin predicts movements in the price of Ethereum, but not vice versa.

Additionally, there is a causal relationship between the prices of Bitcoin and BNB in both directions, with statistical significance at 1% and 5%. The price of Ethereum can predict the price of BNB with 5% statistical significance. This study has contributed to understanding the relationship between major cryptocurrencies and selected traditional financial instruments, stocks, and indexes, as well as comparing their dynamics during the period from 2019 to 2023. Future research should include more variables from both mentioned markets and attempt to construct an adequate model to further investigate the dynamics in these markets, their connectivity, and mutual influence.

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ANALYSIS OF THE PRESENCE OF MOBILE PHONE INSURANCE ON THE MONTENEGRIN INSURANCE MARKET

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***Abstract**: The modern lifestyle and the accelerated development of information technology lead to the fact that a mobile phone becomes a very important personal item of an individual in the realization of private and professional duties. In this regard, owning a high-quality and expensive mobile phone is a key precondition for a modern lifestyle, but also an indicator of an individual's social status. As according to the requirements of the insured, insurance companies should innovate existing, but also introduce new insurance products, that's why Montenegrin companies came up with the idea of introducing mobile phone insurance, as a type of personal items insurance. In addition to compensation for damage in the event of certain physical damage to the mobile phone, this insurance can also cover the risk of mobile phone theft, misuse, and the like.*

The aim of this paper is to examine the level of development of mobile phone insurance in Montenegro, what are the main characteristics of this product, as well as to evaluate the perspective of its development. For this purpose, a web survey was conducted among the citizens of Montenegro in the period May - September 2023. By analyzing the collected data, information was obtained about the current level of representation of this type of insurance in Montenegro, the motives of the insured for (not)concluding an insurance contract, as well as the process and dynamics of claims settlement based on this type of insurance. Also, by applying the χ^2 test, this paper examines whether there are statistically significant differences in the insured's motives for (not)concluding an insurance contract, and what role the socio-demographic characteristics of the insured play in this regard. As the same or similar researches have not been done on this topic, especially when consider the market of the Western Balkans, it is clear that this paper has a significant scientific and practical contribution.

***Key words**: mobile phone insurance, personal items, damage, insurance market, Montenegro*

JEL classification: C12, C83, G22

1. INTRODUCTION

Developed insurance markets offer a diverse range of non-life insurance products predominantly tailored to demand, or the needs of potential insurance users. As people often lose or suffer damage to personal belongings, insurers offer insurance products aimed at providing coverage for the loss or damage of insured's personal belongings in line with their value, such as credit cards, keys, jewelry, phones, and others.

The development of information technologies has led to mobile phones no longer being used solely as a means of communication but also as a tool for learning, payment, i.e., generally for conducting business. It is believed that the mobile phone, or mobile technologies, will be a significant channel for the development of e-commerce in the future, and according to some estimates, will surpass the internet and take over its position as the dominant

business channel for e-commerce. New generations of mobile phones, so-called smartphones, are not only expensive but are also increasingly susceptible to mechanical damage. Some studies have shown that even one out of three people breaks or loses their phone in the first year of use, which has led insurers to introduce a new insurance product - mobile phone insurance. Namely, insurers collaborate with mobile network operators, usually through alternative sales channels such as "Business to Business" sales (B2B sales channel), to market their product to citizens or subscribers of the operators they collaborate with. Through this collaboration model, insurance products are most commonly sold as part of a package with the partner's basic product (mobile phone) or can be additionally contracted. Mobile phone insurance mainly covers one or more accidental damages, losses, technical malfunctions, and theft of the phone, as well as abuse related to any fraudulent use of the lost or stolen device.

Around the world, people are increasingly reliant on their mobile phones. Simultaneously, the threat of cyber attacks is also growing. However, the majority of citizens remain unprotected from the risks of so-called malicious software and/or viruses, as mobile phone insurance protection is mainly limited to covering mechanical damage, i.e., offering what is known as extended warranty for the mobile phone. More precisely, most insurers provide coverage for "traditional risks" related to malfunction, breakage, or theft of the mobile phone. Risks such as misuse of mobile phones, specifically virus attacks manifested through false calls, fraudulent use of e-wallets, etc., are covered by certain insurance companies operating in developed markets. For example, one study showed that in only 6 out of 35 observed countries, there were around 10% of insurance policies providing protection against a single false call, e-wallet use, or virus attack. Virus attacks were covered by only 3% of policies in the observed countries, mainly policies issued in the insurance markets of India and Poland. Protection against false calls or e-wallet use, according to this research, is most prevalent in the United Kingdom.[1]

In the market of Montenegro, there are insurance products for mobile phones distributed predominantly through mobile operators. The aim of this paper is to examine the demand, or the factors influencing demand, and the level of development of mobile phone insurance in Montenegro through the analysis of primary data obtained by surveying Montenegrin citizens. Accordingly, the following research questions and hypothesis are defined:

RQ1: What are the key reasons why citizens of Montenegro do (not) have mobile phone insurance policies?
RQ2: What is the satisfaction of policyholders with the dynamics of claims reimbursement?
H1: There is a significant relationship between the socio-demographic characteristics of respondents (gender, age, education, income, etc.) and their motives for (not) insuring mobile phones.

For this purpose, descriptive statistics and the χ^2 test will be used to confirm/reject the hypothesis.

2. LITERATURE REVIEW

There are very few scientific studies that deal with the specifics of this type of insurance. For example, Prashad et al (2013) emphasize that mobile phones are powerful means of accessing current and potential insurance clients and point out that there are providers offering mobile phone insurance services with added value to make the products tangible and attractive to citizens.[2] The authors explain that mobile phone insurance can be offered for free when purchasing a phone or must be additionally contracted and paid for. When offering this type of insurance, insurers and operators need to assess the market penetration of the product, the perception and understanding of insurance by potential buyers, and adjust their products accordingly. The authors also believe that in markets with limited experience in mobile phone insurance, loyalty-based schemes should be implemented, including free insurance products embedded in the basic offering of mobile operators. However, as markets grow and customers gain experience with this type of insurance, in addition to free insurance services, customers should be offered the opportunity to purchase additional risk coverage for their phones. Independent mobile phone insurance products, covering various risks paid for by the client, should be most prevalent in markets characterized by a more developed insurance culture. Selling insurance under the brand of a mobile operator builds trust in these insurance products, so using

[1] See more: Finaccord report 2021, https://www.finaccord.com/getattachment/Home/About-Us/Press-Releases/10-8-2021-12-00-00-AM/press_release_global_mobile_phone_insurance_2021.pdf.aspx?lang=en-US

[2] For example, services such as weather forecasts, various alerts, and information about crop prices and derivatives on the commodity exchange, which clients receive via mobile phones as part of their insurance package.

the operator's brand in the initial stage of market development makes sense from a distribution standpoint. However, insurers should build their own brand, recognizable to clients, enabling the development of other distribution channels, including independent or direct sales of mobile phone insurance.

Wondirad (2020) in his study explores how mobile insurance works and its impact on clients and microfinance institutions (MFIs) in Kenya. The author conducts research and shows that Africa has 600 million mobile subscribers, of which 44 million are insured. The author also concludes that both types of mobile phone insurance products (loyalty-based and paid) are practiced in the Kenyan insurance market and emphasizes that microfinance institutions should partner with mobile network operators, insurers, and other stakeholders to be financially and socially sustainable.

Jovanović (2019) explains in his study that the subject of insurance for portable electronic devices can also be individual devices from different manufacturers, so it is possible that only mobile phones are covered under specific insurance conditions or as part of an insurance program. The author gives an example of the practice of the Bank of Scotland regarding comprehensive insurance for current account holders, which, in addition to travel insurance, sudden vehicle breakdown or household breakdown insurance, also provides coverage for repair or replacement costs of one mobile phone up to £2,000 per claim due to loss, theft, damage, or breakage. The aim of authors of this paper is to point out the possibilities of insuring portable electronic devices, including mobile phones, in Serbia.

According to the author's knowledge, except for the last one mentioned, so far, neither in Montenegro nor in other countries of the Western Balkans, have studies been conducted regarding mobile phones, the risks they are exposed to, insurance methods and distribution, perceptions, and analysis of citizens' needs for this insurance product, etc.

3. MOBILE PHONE INSURANCE IN MONTENEGRO

According to the latest research from the World Economic Forum's Global Competitiveness Index for 2019, Montenegro ranks as high as 4th among 141 observed countries when it comes to the number of active mobile phone subscribers. Specifically, in Montenegro, there are 180 mobile subscriptions per 100 inhabitants. Besides Montenegro, Lithuania and Russia also dominate among European countries in this indicator. Hong Kong holds the first position with almost 260 active mobile devices per 100 inhabitants, while in the United Arab Emirates, there are twice as many mobile subscriptions as the population. In Ethiopia, only 37 out of 100 inhabitants have at least one mobile phone.[3]

Looking at the countries in the region, Slovenia, Croatia, and recently Bosnia and Herzegovina, have an average of over 100 active mobile devices per 100 inhabitants. In North Macedonia, Serbia, and Albania, penetration is below 100, meaning that there might still be citizens who do not use mobile phones at all. Both Albania and North Macedonia have experienced a decline in the number of active users. Since the indicator in both countries was above 100 a few years ago, this suggests that some users have gradually stopped the practice of carrying two phones over time.[4]

In Montenegro, phones are primarily insured through mobile operators. For example, the company One, in cooperation with Lovćen Insurance, offers mobile phone insurance to all postpaid users. Users have the option to choose a package that covers accidental physical damage (resulting from falls, impacts, pressure, contact with any type of liquid) and damage caused intentionally by third parties with a police report. There is also an additional package that, in addition to the aforementioned risks, covers most cases of theft (burglary, robbery, pickpocketing - theft from the user's pocket or from the handbag the user is carrying), unauthorized calls after theft within the first 24 hours, and provides extended warranty for one year after the expiration of the warranty for internal damages. Under these conditions, only mobile phones purchased from the One company can be insured, and the insurance policy can be concluded within 7 days from the day of purchase of the device.[5] According to the General Insurance Terms[6], this product does not cover aesthetic damages that do not affect the device's performance, deterioration of the battery condition, damages caused by unauthorized servicing, negligence, or illegal behavior while driving by the insured, as well as damages related to additional equipment provided or used with the

[3] See more: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

[4] See more: www.bankar.me

[5] See more: https://1.me/cg/privatni/usluge/osiguranje-telefona/

[6] General Insurance Terms for the insurance of mobile electronic devices purchased from the mobile telephony service provider, Lovćen Insurance Podgorica

device. Additionally, theft risk is excluded under these terms if it occurs by leaving the phone unattended in a public place or if the device is simply lost.

The premium amount depends on the type of device and the selected insurance package, and a deductible is also mandatory, which also depends on the insurance package and the value of the phone itself. The Picture 1 shows the premium amounts paid within the defined insurance offer packages.

Telekom Montenegro, in collaboration with Sava Insurance, offers its customers coverage for physical damage to mobile phones due to falls or impacts, as well as coverage for burglary and robbery theft for phones priced over €350. The insurance contract for mobile phones is concluded for a period of 12 or 24 months and includes a deductible franchise. The offer from Sava Insurance Podgorica is provided in Table 1.

Picture 1. *Mobile phone incurance's offers, Lovćen Insurance Podgorica*

Source: https://1.me/cg/privatni/usluge/osiguranje-telefona/

Table 1. *Mobile phone incurance's offer, Sava Insurance Podgorica*

Mobile phone price	Amount of franchise	Monthly premium (24 months)
€350-€600	€40	€4
€600,01-€900	€60	€6
Over €900	€100	€10

Source: https://telekom.me/privatni-korisnici/osiguranje-telefona

This insurance does not cover damages identical to those provided by Lovćen Insurance. In cases where the phone cannot be repaired or repair is not economically viable, or if the phone is stolen, the insured party is compensated for the total loss amount, with the insured sum reduced for depreciation and the agreed deductible. The monthly depreciation rate is 2% and is not charged for the first 6 months from the purchase of the phone.[7]

4. METHODOLOGY AND DATA

Further analysis in this paper is aimed at examining the prevalence of mobile phone insurance in Montenegro, as well as the motives for (not) concluding insurance contracts, and determining the influence of socio-demographic factors on the decision to (not) conclude a contract. In this regard, a web survey was conducted among citizens of Montenegro from May to September 2023. The survey was structured into three parts: 1) general data about the respondents, 2) questions regarding the characteristics of the policy and the motives driving the policyholders to conclude insurance policies, and 3) questions related to the procedure and dynamics of claims settlement, as well as satisfaction with them. The research included 882 citizens of Montenegro with different socio-demographic characteristics.

To provide answers to the research questions and test the hypotheses, the obtained data were processed using descriptive statistics and the χ^2 test. These two statistical methods, given their characteristics, are fully applicable in this type of research.

Among the respondents, 64.3% were female, while the age group most represented was respondents aged between 25 and 39 years (39,5%). Following them were respondents aged 18 to 24 years (32,3%), while the least represented age group was respondents over 65 years old, comprising only 2% of the total sample. The respondents were predominantly from the central region (69%) and

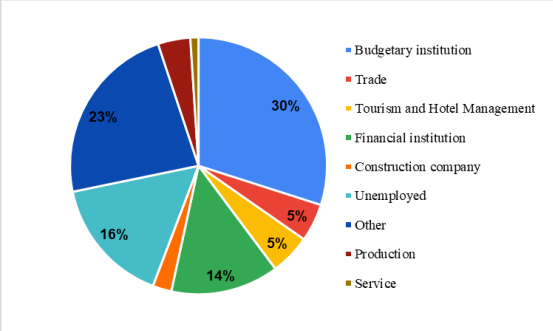
[7] See more: https://telekom.me/privatni-korisnici/osiguranje-telefona

had a high level of education, with 81% of the total number of respondents having a high level of education.

Regarding employment criteria, 81,3% of the respondents were employed, of which 58,4% worked in the public sector.

Employed respondents predominantly worked in budgetary institutions (around 30%), followed by financial institutions (13,6%), and approximately 23% of respondents worked in unspecified sectors, as shown in Graph 1.

Graph 1. *Type of institution/company where respondents work*



Source: *Authors' calculation*

The last analyzed criteria were marital status and monthly income. The majority of respondents were not married (55,4%), followed by respondents who were married with children (36,7%). Regarding income, 18% of respondents did not have stable monthly income. The largest percentage of respondents, 40,1%, had income in the range of €450-€700. 29,6% of respondents had income between €700 and €1.000, while over €1.000 per month was received by approximately 12,3% of surveyed citizens of Montenegro.

5. RESULTS

As previously mentioned throughout the paper, answers to the research questions, as well as the decision to accept/reject the hypothesis, will be provided through the application of descriptive statistics and the χ^2 test.

Examining the current level of prevalence of this type of insurance among citizens of Montenegro, the research showed that a staggering 93,9% of respondents do not have mobile phone insurance policies. In terms of gender, 65,2% of respondents without a policy are women, while considering age within this category of respondents (without a policy), the youngest respondents, aged between 18 and 39 years, are the most represented (72,46%). On the other hand, policies are most commonly held by respondents aged 18-24 years and 40-65 years (both at 38,9%).

When considering the reasons why citizens do not have insurance contracts for their mobile phones, the primary reason highlighted is respondents' lack of knownledge of the existence of this type of insurance (69,4%), followed by the fact that 16% of respondents believe they do not need such insurance because they "take pretty good care of their mobile phone." Following these are reasons such as viewing this type of insurance as "a waste of money," and nearly 8% of respondents stating they have a less expensive phone model that does not require insurance.

On the other hand, reasons cited by respondents who have insurance policies include owning an expensive phone, the necessity of this type of insurance due to today's lifestyle, and entering into an insurance contract based on the recommendation of the seller/operator. Predominantly, policies are concluded through operators from whom the phone was purchased.

This also provides an answer to RQ1, which pertains to the reasons for (not) possessing a mobile phone insurance policy.

When considering the satisfaction of policyholders with the dynamics of claim compensation, only 11% of respondents who have a policy experienced some form of damage covered by the insurance contract, half of whom were satisfied with the compensation process and the amount of compensation received. The rest filed a complaint against the decision of the insurance company, which was subsequently upheld by the commission. Due to the small percentage of individuals with mobile phone insurance policies and therefore a small percentage of those who experienced damage, it is difficult to confidently provide a precise answer to the second research question regarding the satisfaction of policyholders with the dynamics of claim compensation. Data from this paper suggests a moderate level of satisfaction among policyholders with the dynamics of claim compensation for mobile phone insurance.

For the statistical analysis of the relationship between decisions to conclude insurance contracts and the socio-demographic characteristics of respondents, the χ^2 test is used. This is a specific type of non-parametric statistical test used when the variables observed are categorical, and it is used to determine the level of independence or agreement between variables. The complete analysis conducted below was performed using the statistical software package SPSS 27. This test was used to test the hypothesis set forth in the paper.

In the first part, it was analyzed the relationship between the decision to possess a mobile phone

insurance policy and various demographic characteristics of respondents. The results summarizing the values of the χ^2 test, along with the corresponding p-values and the appropriate values of the Cramer's V coefficient, are provided in the following table.

Table 2. *Determining the connection between the decision to own a policy and socio-demographic characteristics*

Variable	χ^2	p-value	Cramer's V
Gender	1,704	0,192	0,076
Age	3,272	0,352	0,105
Region	2,601	0,272	0,094
Education	0,948	0,330	0,057
Employment	0,000	1,000	0,000
Sector	0,944	0,624	0,057
Activity of company	7,103	0,526	0,115
Marital status	3,165	0,367	0,104
Monthly income	12,558	0,014*	0,207*

**level of significance – 5%*

Source: *Authors' calculation*

The first column of the table lists the variables whose values were determined by the survey. The second column provides the values of the χ^2 test, where the coefficient size indicates the differences between expected and observed frequencies. The third column displays the p-values and provides information on whether these differences are statistically significant. Finally, the fourth column contains data on the values of Cramer's V, which measures the strength of association between the corresponding variable from the first column and the variable indicating whether the respondent has a policy or not.

The results from the table indicate that most socio-demographic characteristics do not have a statistically significant relationship with the decision to possess a mobile phone insurance policy, as the p-values are greater than 0,05, except for the variable "monthly income," where the p-value is 0,014, indicating a statistically significant difference. The Cramer's V for monthly income is 0,207, indicating a relatively weak to moderate association between income level and the decision to possess a mobile phone insurance policy.

These results unequivocally suggest that among the examined socio-demographic characteristics, income level may have the greatest influence on the decision to obtain mobile phone insurance. Other characteristics have very weak or no association with this decision.

When considering the potential intention to conclude a policy in the future for those respondents who currently do not have a policy, it is interesting to examine the relationship between socio-economic characteristics and their responses to whether they would conclude a mobile phone insurance policy in the future. In this regard, the following are the results of the χ^2 test and Cramer's V values.

Table 3. *Determining the connection between the decision on the intention to conclude a policy and sociodemographic characteristics*

Variable	χ^2	p-value	Cramer's V
Gender	7,670	0,053	0,162
Age	5,689	0,771	0,139
Region	6,701	0,349	0,151
Education	1,383	0,709	0,069
Employment	0,414	0,937	0,038
Sector	1,316	0,971	0,067
Activity of company	18,501	0,778	0,251
Marital status	6,103	0,730	0,144
Monthly income	13,784	0,315	0,217

**level of significance – 5%*

Source: *Authors' calculation*

The coefficients in the second and third columns indicate that there is no statistically significant association between any of the identified socio-demographic characteristics and the decision to conclude a policy in the case of current non-possession, not even the amount of monthly income.

Additional analysis has revealed several other interesting results, which are presented in the following table.

Table 4. *The connection between knowledge about the risks covered by the policy and other matters of importance for the decision to own the policy*

Question 1/ Question 2	Do you know what risks the policy covers?		
	χ^2	p-value	Cramer's V
Do you have a polisy?	170,44	0,001	0,781
Are you satisfied with the product?	257,57	0,001	0,936
Are you planning to renew your policy?	253,471	0,001	0,929

Source: *Authors' calculation*

For instance, when considering the correlation between knowledge about the policy and the decision to conclude it, it can be concluded that there is a strong association between the decision to possess the policy and having information about the risks covered by the policy (χ^2 = 170,44, and Cramer's V = 0,781).

Furthermore, there is a correlation between satisfaction with the insurance product and the level of knowledge of the respondents about the coverage of risks by the policy, which supports the argument that awareness and product knowledge are crucial for the decision to purchase insurance policies, highlighting the importance of campaigns for client awareness.

It's also evident from the table that knowledge of risk coverage is associated with plans to renew the policy in the future, further supporting the previous argument.

The results of this research provide a clear insight into the current state and prospects of mobile phone insurance in Montenegro, highlighting the factors influencing individuals' decisions to insure their mobile phones. These results unequivocally demonstrate that awareness of the need for mobile phone insurance is still underdeveloped and largely determined by the amount of monthly income and individuals' awareness of the information about the risks that can be covered by such a policy.

CONCLUSION

Mobile phone insurance is becoming an increasingly important aspect of modern lifestyles, as people frequently rely on expensive phones to fulfill their personal and business obligations. The fast-paced way of life often leads to situations involving loss, damage, or theft of mobile phones, prompting non-life insurance companies to include mobile phone insurance in their offerings.

The aim of this research was to outline the basic characteristics of mobile phone insurance and assess the current state of the market in Montenegro regarding the level of development and prospects of this type of insurance. Based on surveying citizens of Montenegro, the researchers addressed two research questions and tested one hypothesis. The findings indicate that a large number of respondents are unaware of mobile phone insurance, and some believe they carefully safeguard their phones, therefore not needing insurance. The main reasons for not having mobile phone insurance among citizens of Montenegro are lack of awareness about this insurance product and ignorance of the risks covered by the policy.

Although a small percentage of respondents have mobile phone insurance, they generally acquired it because they own an expensive phone or were persuaded by the phone retailer from whom they purchased the device. Regarding satisfaction with the claims process, the results suggest partial satisfaction, but given the small sample size, this finding should be interpreted with caution.

Testing the hypothesis revealed a statistically significant relationship between income and the decision to (not) purchase insurance, while awareness of mobile phone insurance in Montenegro is still not at an acceptable level and is primarily influenced by monthly income and individuals' knowledge of the risks covered.

This paper provides a significant scientific contribution, complementing existing literature on mobile phone insurance. Additionally, the research findings can be useful for insurance companies in Montenegro to enhance the promotion of this product among citizens and raise awareness of its importance.

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Original Article

MIGRATION AND CULTURAL TRANSMISSION PATTERNS: FACTOR IN THE PROCESSES OF DEMOGRAPHIC TRANSITION IN CENTRAL ASIAN COUNTRIES

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***Abstract**: The demographic transition in Central Asian is contradictory and complicated because of the problems formed by the post-Soviet collapse of economic and social infrastructure, the transformation of power and cultural processes associated with the Islamic renaissance and agrarian overpopulation. These factors have a serious impact on the economic growth of the Central Asian countries, concentrating the main economic indicators around labor emigration. Since Russia is the main partner-acceptor of migrant workers from the above-mentioned countries, its culture has a significant impact on visitors from Central Asian countries. Russia is a country with a predominantly urban population and a high spread of secular values, whose cultural characteristics can influence the transformation of collective perceptions of migrants, which in turn can have a significant impact on the demographic and social behavior of returning citizens of Central Asian countries. The article presents the results of a surveys, that were conducted among non-ethnic migrants in 2017 (N=231) and in 2019 (N=222), and data on their interviewing in 2017 (N=16) were collected. As a result, signs of assimilation of urban identity were identified, as well as the integration of cultural elements defining values that can contribute to the processes of demographic transition among residents of Central Asian countries upon returning to their homeland. The concept of cultural identity, defined as a multicomponent hierarchical complex of group affiliations in the system of common social identity, is used as a central research category that allows for a more detailed examination of ongoing social changes.*

***Key words**: migrants, Central Asia, demographic transition, cultural integration, cultural identity, survey, Yekaterinburg*

JEL classification: J11

1. INTRODUCTION

The Central Asian countries, which include Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan, are an important strategic partner of the Russian Federation today, as well as a potential source of human capital not only for Russia, but also for the world community. In the context of a declining birth rate and a population aging in all developed countries of the world (World Population Prospects, 2022), the problem of replenishing residents who are ready to work is becoming increasingly urgent. The process of demographic transition in some countries inevitably entails the need to import labors from other countries, which means that it actualizes issues of its quality, volume and adaptive abilities.

The population of the Central Asian countries is quite large, also has a significant proportion of young people in its composition, and thus holds the position of the region as a donor of labor resources. However, signs of entering in period of declining fertility and mortality are also observed in Central Asian countries (Mahmudov & Galfinger, 2016), which in the long term will affect a decrease in their migration potential. Thus, according to UN forecasts, by 2025 the fertility rate in the region will be 2.81, and by 2050 it will fall to 2.24 (United Nations, the

Department of Economic and Social Affairs, 2022). Since Central Asia is an important region for the geopolitical interests of Russia, and also for a number of neighboring countries (in particular China), its importance for other countries will grow in the future. So a comprehensive assessment of social characteristics trends in potential donor- regions of migrant workers acquires high practical importance.

2. DATA AND METHODS

Among the conditions of demographic transition, it is customary to identify a number of factors like different levels, such as technological development, advances in medicine and pharmacology, increasing life expectancy, reducing mortality and birth control; economic development and per capita income, industrialization, and access in education (Vishnevsky, 1982; Zvereva, 2015). But in conditions when a large number of countries have already achieved high level in these areas, it becomes relevant to talk about the impact of progress on changing the social characteristics of different less developed communities. In the context of globalization and mass international migrations, the results of cultural interventions of some societies into others, including changes in demographic trends in nation-states, are becoming more significant (Coleman & Gietel & Billari, 2015; Mehrishvili&Tkacheva&Yudashkin, 2022). The new cultural identity acquired by migrants is seen as a system that exports norms and values from one culture to another.

The close interaction of representatives of Central Asian countries and Russians in the framework of labor and educational migration have an impact on the transformation of traditional cultural practices, values and collective ideas. Due to the specifics of migrants from Central Asian countries, characterized by pendulum movements and long staying in the territory of the Russian Federation, one way or another, the cultural elements of the host country are transferred to the releasing countries.

In order to study cultural interaction and the influence of Russian culture on the identity of migrants from countries such as Tajikistan, Uzbekistan, Kyrgyzstan and Kazakhstan, the authors of the article conducted research for several years among residents of Yekaterinburg (Russia) and visitors of the city:

1. Standardized interview survey of migrants from Central Asian countries (N=231, 2017). Type of sampling procedure – quota sampling, quota feature in the selection process – gender, age, country of departure, education;

2. Standardized interview survey of migrants from Central Asian countries (N=222, 2019). Type of sampling procedure – quota sampling, quota feature in the selection process – gender, age, country of departure, education;

3. In-depth interview survey of migrant workers from Central Asian countries (N=16, 2017);

4. In-depth interview survey of migrants from Central Asian countries (N=9, 2023), the selection of informants for interviews was based on the application of the following criteria: education (higher or secondary education received in Russia), job position, age.

3. THE RESULTS

Since urbanization is defined as one of the most important factors of demographic transition affecting a long-term decline in population growth (Vishnevsky, 2018), elements of urban culture acquire high importance as part of the cultural identity perceived by migrants from Central Asian countries. Russian society is characterized by a high level of urban population: 74.9% according to Rosstat figures for 2023, the countries of Central Asia lag far behind in this indicator. In 2023, the share of the urban population was 36.6% in Kyrgyzstan, 50.4% in Uzbekistan and 27.3% in Tajikistan (United Nations Department of Economic and Social Affairs, 2023).

Visitors from Central Asian countries primarily move from rural areas to the urban environment of Russia. In the receiving country, migrants learn the norms and values of citizens, new daily practices, perception of time and space, etc. Our research shows the assimilation of identity elements with urban culture among migrants from Central Asian countries, which are shown by the following indicators:

- Egocentric attitude in decision-making: at the first place among the answers (50.9%) is the opinion that when making a choice, respondents are guided by their personal understanding of the situation, their judgment about how a person should behave. This type of thinking and action is a counter position to the traditional type of human behavior based on collectivity and the high importance of the community opinion to which a person belongs.

- The importance of their physical condition: more than half of the migrants replied that maintaining

their health (50.5%) is the most valuable thing in their life. This answer is the second most popular after the «importance of the family» and overtakes the value of «friendly communication» and «material well-being». This order of answers puts a value attitude towards individualization, and characterizes it as a social phenomenon used to to urban consciousness.

- The feeling of getting used to life in the city signals the adoption of a special form of Russian cultural identity among migrants. Urban identity is determined by a sense of comfort in an urban environment, the absence of fear of tall and monumental buildings, large busy roads and transport, the specifics of relations between citizens, the ability to use the benefits offered (goods, service, professional choice) and solve problems using tools that exist in megacities. This condition appears only over time, especially if the migrant does not come from a small town to a large one, but from a rural area to a megalopolis. A long stay in Russian cities changes the feeling like alienation of the urban lifestyle among migrants to its acceptance, which indicates the assimilation of urban identity elements among respondents from Central Asian countries. According to our data, a fairly large number of respondents replied that they were completely used to living in the city (40.3%), but a significant part of 35.9% noted that they were only partially used to it. At the same time, only 9.1% said they could not get used to it at all yet. Thus, in general, there is an obvious tendency for migrants from Central Asian countries to successfully assimilate urban identity.

- A pretty good perception the way of Yekaterinburg citizens behave: almost a third of migrants, in response to the question of “how culturally Yekaterinburg residents behave”, replied that "many behave quite culturally" (27.7%). In the first place was the answer "in different ways" (58.9%). Complete rejection the manners of Yekaterinburg residents was noted by only 6.5%, which demonstrates tolerance to the urban type of behavior of Russians. That means a potential willingness to adopt it partially or completely.

- Adapting their clothes to the norms of the host community: from all of the respondents, only 9.7% noted that they try to adhere to the national style of clothing being in Russia. Everyone else chooses stile worn by Yekaterinburg residents, which means an image adopted in a secular urban environment that differs from that adopted in their native culture.

CONCLUSION

Based on the results presented above, it can be said that elements of the urban culture of the Russian host community are becoming part of the social identity of migrants from Central Asian countries, that will certainly be exported to some extent from Russian society to Kyrgyzstan, Uzbekistan, and Tajikistan. In the long term, this circumstance will contribute to the speed with which the the demographic transition in Central Asia will be transformed.

According to UN forecasts, the urbanization of these countries will increase to 50% on average in the region by 2050. However, the formation of cultural identity with elements of urban identity among representatives of Central Asian countries who have been in Russia for a long time can lead to the emergence of a contradictory social situation when urban identity is formed before the cities themselves. Therefore, the demand from the population to accelerate urbanization (not only its volume, but also its quality (Emelyanova & Vikentieva & Tarasov, 2022) will be felt more strongly over time, which may become a factor contributing to a faster demographic transition process than is currently predicted.

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THE EFFECT OF RECENT CRISIS SITUATIONS ON THE SUSTAINABILITY OF INDEBTEDNESS OF THE FINANCIAL SECTOR OF SERBIA

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***Abstract**: This study examines how recent crises have affected the capacity of the Serbian financial sector to service its debt. The research, which covers the years 2014 to 2022 and focuses on the financial and economic difficulties faced by the industry after the crisis, uses the debt ratio as its primary dependent variable and several selected macroeconomic and microeconomic indicators as independent variables. The aim of the study is to show how resilient and adaptable the industry is to challenging economic circumstances by examining the dynamics of indebtedness in the financial sector during periods of crisis. The results of this study will improve the understanding of the capacity of the financial sector to sustain debt during periods of economic crisis and will provide insight to policymakers, industry participants, and financial institutions regarding possible approaches to increase financial stability and longevity in this domain.*

***Keywords**: Indebtedness, debt, financial sector*

JEL classification: G10, G21, G32

1. INTRODUCTION

The financial stability of banking institutions is intricately intertwined with the complex interplay of macroeconomic and microeconomic factors. Nowhere is this more evident than in the context of Serbia, where banks navigate a dynamic economic landscape shaped by both domestic and global forces. Understanding the influence of these macroeconomic and microeconomic factors on the debt levels of banks in Serbia is crucial for assessing their resilience and sustainability within the financial system. At the macroeconomic level, factors such as GDP growth, inflation rates, and government fiscal policy play significant roles in shaping the operating environment for banks. Economic growth can stimulate loan demand, leading banks to extend credit more liberally, while inflationary pressures and exchange rate volatility can affect the value of assets and liabilities on banks' balance sheets On the microeconomic front, factors such as bank-specific characteristics, risk management practices, and regulatory frameworks exert considerable influence on debt dynamics. Banks' capital adequacy, liquidity management, and asset quality significantly impact their ability to manage debt effectively. The interaction between macroeconomic and microeconomic factors creates a dynamic environment wherein banks in Serbia must navigate to maintain sound financial health. Understanding the intricate relationship between these factors is essential for policymakers, regulators, and market participants alike to formulate effective strategies for ensuring the stability and resilience of the banking sector amidst evolving economic conditions.

There are five sections in the paper. The topic and purpose of the research were stated in the first

part, along with some opening remarks. A review of the pertinent literature is included in the next section. The methodological framework of the study is covered in the third section, along with a list of the econometric models and pertinent diagnostic tests that were used. The research findings are presented and their significance is discussed in the fourth section. The collected results are described in the final part, which also contains recommendations for additional research and a list of the study's shortcomings.

2. THE REVIEW OF LITERATURE

Djalilov & Piesse (2016) conducted a study to investigate the determinants influencing bank profitability in early-transition CEE (Central and Eastern Europe), late-transition countries in the former Soviet Union, and both. Petria, Capraru, and Ihnatov (2015) conducted an investigation of 27 European Union financial systems as part of another study. One of the research looked at whether raising capital requirements makes banking institutions run more economically and effectively while lowering risk. It encompassed 39 OECD nations (Bitar, Pukthuanthong & Walker, 2018). The results showed that while both risk-based and risk-free capital ratios boost bank productivity and profitability, risk-based capital ratios do not lower bank risk.

Singhal, Goyal, Sharma, Kumari, and Nagar's (2022) study includes a capitalization and profitability ratio analysis using the banking sectors of the BRICS nations as an example.

Adelopo, Lloydking, and Tauringana's (2018) study examined the relationship between macroeconomic factors unique to banks and bank profitability in the African ECOWAS member states prior to (1999–2006), during, and following the financial crisis (2010–2013). Islam & Nishiyama (2016) investigated how 259 banks in South Asian nations like Bangladesh, India, Nepal, and Pakistan were affected by macroeconomic, industry-specific, and bank-specific factors. Lopez-Penabad, Casal, and Neto (2022) concluded that a brief decline in interest rates reduces the net interest margin when rates are already negative.

There are several studies pertaining to the analysis of banking indicators in a single country in addition to research encompassing multiple countries. Alaagam (2019) investigated the variables influencing Saudi Arabian banks' profitability. The Madugu, Ibrahim, and Amoah (2019) study was centered on Ghana's banking industry. Numerous scholars have examined the profitability of public and private banks in the Indian market, including Bansal, Singh, Kumar, and Gupta (2018), Brahmaiah & Ranajee (2018), Kiran & Jones (2016), and Narwal & Pathneja (2016). Acaravci & Calim's (2013) study concentrated on the profitability of the Turkish banking industry and the effects of macroeconomic and microeconomic variables. Miljković, Filipović & Tanasković (2013) featured a comparison of Serbia's banking industry with those of Central, Eastern, and Southern Europe, as well as an examination of the banking sector's market concentration. Conversely, a study conducted in 2019 by Vesić, Gavrilović & Petronijević contained a summary of the liquidity and profitability of the biggest banks in Serbia's banking industry.

3. RESEARCH METHODOLOGY

An investigation of 20 banks from Serbia's financial industry is part of the research. The coverage period was from 2014 to 2022, with a segmentation between times immediately following and during crises. The years 2018 to 2022 are categorized as the post-crisis period, whereas the years 2014 to 2017 are regarded as the crisis period. To have a deeper understanding of the impacts of macroeconomic and microeconomic factors, segmentation was carried out. The dynamic GLS (Generalized Least Squares) model is used, and it represents a statistical method used to analyze data by accounting for heteroscedasticity and serial correlation, allowing for more accurate parameter estimation in dynamic systems. The dependent and independent variables utilized, together with the computation techniques, are displayed in Table No. 1 below.

Table 1. Dependent and independent variables

Variables	Calculation	Symbol
Dependant variables		
Debt/Assets	Total debt/Total assets	DEBT
Independent variables		
General Liquidity	Current assets/Current liabilities	GL
Profitability	Net profit/ Total assets	ROA
Net interest margin	Net interest profit/Total assets	NIM
Capital adequacy	Capital/Risk weight assets	CA
Nonperforming loans	% Nonperforming loans	NPL

Variables	Calculation	Symbol
Gross domestic product	% Annual growth	GDP
Inflation	% CPI Annual	INF

Source: author's

Based on defined segmentation criteria as well as dependent and independent variables, the authors generated the following equations:

$$CDebt_{it} = \alpha + \beta_1 GL_{it} + \beta_2 ROA + \beta_3 NIM_{it} + \beta_4 CA_{it} + \beta_5 NPL_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \varepsilon$$

$$PcrDebt_{it} = \alpha + \beta_1 GL_{it} + \beta_2 ROA + \beta_3 NIM_{it} + \beta_4 CA_{it} + \beta_5 NPL_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \varepsilon$$

Where are:

CDebtit = Debt to assets in the crisis period ratio for bank i in time period t

PcrDebtit=Debt to assets in the post-crisis period ratio for bank i in time period t

GLtit = Liquidity ratio for a bank I in time period t

ROAtit = Profitability ratio for a bank i in time period t

NIMtit = Net interest margin of the bank i in time period t

CAtit = Capital adequacy ratio for a bank i in time period t

NPLtit = Non performing loans of the bank i in time period t

GDPt= GDP growth rate in time period t

INFt= Inflation growth rate in time period t

Table no. 2 below shows the descriptive statistics of the variables used in both models. Model 1 statistics show that general liquidity, GDP growth, and non-performing loans had the highest level of standard deviation which means that in the case of those variables, the trend during the pre-crisis period was more prone to big swings. In model 2 the same variables also showed the highest levels of standard deviation but on a smaller level compared to the pre-crisis period. The non-performing loans and general liquidity variable showed the greatest levels of standard deviation.

Table 2. Descriptive statistics

Var.	Mean	Max	Min	Std. Dev
Model 1				
Cdebt	0,6216	0,8444	0,1588	0,1566
GL	2,474	11,2	1,11	1,6018
ROA	-0,024	0,1205	-1,421	0,1633
NIM	0,0413	0,1267	0,0039	0,0196
CA	0,2267	0,8515	0,0881	0,1154
NPL	17,452	21,584	9,848	4,8269
GDP	-0,793	0,8485	-2,136	1,1565
INF	0,0224	0,0297	0,0155	0,0057
Model 2				
PcrDebt	0,6424	0,9201	0,0118	0,1484
GL	2,358	6,48	1,11	1,1283
ROA	0,0044	0,0417	-0,054	0,0169
NIM	0,0305	0,126	0,0002	0,0202
CA	0,1855	0,9879	0,0695	0,1063
NPL	4,3303	9,848	3,5744	1,0319
GDP	-2,213	1,1393	-8,823	3,899
INF	0,0324	0,0609	0,0166	0,0166

Source: author's

4. FINDINGS AND DISCUSSION

The authors first report the outcomes of unit root tests in this section of the study to demonstrate stationarity. They then do a variance inflation factors test to prove the lack of multicollinearity, and in the remaining sections, they highlight the key findings of this investigation. The results of panel unit root tests, including the Levin, Lin, and Chu test and the Im, Pesaran, and Shin test, are displayed in Table No. 3. Microeconomic indicators exhibit stationarity at the level indicated by the coefficients and statistical significance levels reported, but the GDP and INF variables achieve stationarity following the first difference.

Table 3. Unit root tests

Variables	Levin, Lin & Chu		Im, Pesaran & Shin	
	Level	1st diff	Level	1st diff
DEBT	-6,09540 (0,0000)	-7,28090 (0,0000)	-2,63672 (0,0042)	-2,45006 (0,0000)
GL	-8,65526 (0,0000)	-2,69477 (0,0035)	-14,0054 (0,0000)	-5,03194 (0,0000)
ROA	-78,5568 (0,0000)	-29,7340 (0,0000)	-166,878 (0,0000)	-30,1560 (0,0000)
NIM	-4,47987 (0,0000)	1,13920 (0,8727)	-16,0116 (0,0000)	-6,01426 (0,0000)
CA	-23,7413 (0,0000)	-6,94017 (0,0000)	-60,0100 (0,0000)	-11,6351 (0,0000)
NPL	-23,3474 (0,0000)	-2,99321 (0,0014)	-12,8515 (0,0000)	-0,33348 (0,3694)
GDP	16,7310 (1,0000)	4,42571 (1,0000)	-21,7891 (0,0000)	-7,42355 (0,0000)
INF	17,7885 (1,0000)	2,97850 (0,9986)	-13,9371 (0,0000)	-4,36735 (0,0000)

Source: author's

A variance inflation factor test was performed to determine whether multicollinearity existed

between the employed independent variables once the stationarity of the data had been established. Since the average value of the VIF indicator is less than the threshold value of 10, the average value of 2,58763 shows the lack of multicollinearity.

Table 4. VIF Test

Variables	Centered VIF
GL	1,127491
ROA	1,20651
NIM	1,188568
CA	1,169374
NPL	2,364535
GDP	6,637947
INF	4,418974
AVERAGE VIF	2,587628429

Source: author's

Table no. 5 below shows the results of the panel regression. The table presents separate results for Model 1 (Pre-crisis) and Model 2 (Post-crisis). In the case of model 1, the results indicated the statistical significance of the effects of indicators of liquidity, profitability, net interest margin, GDP, and inflation. In the pre-crisis period, liquidity is the only indicator that showed a negative impact, a 1% increase in liquidity leads to a decrease in debt value by -0.0244, which indicates the tendency of banks in the pre-crisis period to use their own funds to increase liquidity. A 1% increase in profitability, Net Interest Margin, GDP, and Inflation leads to an increase in debt by 0.323%, 0.0207%, and 4.3309% respectively. The results indicate that during the pre-crisis period, the growth of profitability and net interest margin affected the growth of debt, which leads to the conclusion that banks distributed excess funds to shareholders at the end of the business year and used additional debt for further business financing. There is also a noticeable impact of GDP on the growth of bank debt in the pre-crisis period, while this is not the case in the post-crisis period. The impact of inflation is also significant and intensive in the pre-crisis period compared to the post-crisis period - The intensive effect of inflation is also explained through the effect of profitability, where the tendency of the distribution of profits in relation to reinvestment of profits is shown. Therefore, inflation led to an increase in the price of debts, which explains the intense positive effect. In the post-crisis period, an indicator that had no impact in the pre-crisis period is capital adequacy, a growth of 1% leads to a decrease in debt of 0.7338%. Such an effect can be explained by the tendency of banks to concentrate their own funds, in relation to debt, in the crisis period, to protect against potential risks to which the bank is exposed in its own operations. The effect of GDP and inflation is also present in the post-crisis period but with a lower statistical significance of 10%.

Table 5. Panel regression

Variables	Model 1	Model2
	GLS	GLS
GL	-0,024396 (0,0000)	-0,009212 (0,2683)
ROA	0,323398 (0,0169)	0,431113 (0,1705)
NIM	2,394665 (0,0000)	2,096176 (0,0000)
CA	-0,099654 (0,1982)	-0,733828 (0,0000)
NPL	0,002335 (0,2784)	0,005903 (0,5798)
GDP	0,020682 (0,0097)	0,024512 (0,1108)
INF	4,330867 (0,0056)	5,489293 (0,1062)
C	0,490699 (0,0000)	0,591313 (0,0000)
R squared	0,706835	0,760487
Probability	0,0000	0,0000

Source: author's

Table 6. Diagnostic Heteroskedasticity Test

Variables	
Heteroscedasticity Panel LR test	63,54292 (0,0010)
Model 2	
Heteroscedasticity Panel LR test	67,25039 (0,0000)

Source: author's

When selecting a model in table no. 5, a diagnostic test of heteroskedasticity was performed to determine the adequacy of the use of the model. The results of the panel LR test indicated the presence of heteroscedasticity of the data in both models, so it was decided to accept the dynamic GLS (Generalized Least Squares)

model in both models, in order to interpret the obtained results as accurately as possible.

CONCLUSION

In summary, the study's results shed light on the intricate dynamics of bank behavior in both pre- and post-crisis periods. During the pre-crisis era, factors like profitability, net interest margin, GDP, and inflation significantly influenced bank debt, indicating a tendency toward leveraging for expansion and profit distribution. Notably, inflation exerted a particularly intense effect, intertwined with profitability, driving up debt prices. However, in the aftermath of the crisis, a shift occurred, marked by the emergence of capital adequacy as a significant factor. Banks, wary of risks, opted to bolster their own funds, thus reducing reliance on debt. While the influence of GDP and inflation persisted post-crisis, their significance diminished slightly. These findings underscore the adaptive nature of banks in navigating economic landscapes, adjusting strategies to mitigate risks, and capitalize on opportunities, thereby contributing to the resilience and stability of the financial system. Suggestions for further research are the use of more countries with a similar financial sector for comparative analysis, as well as the use of a longer time period to include a larger number of crisis and post-crisis situations.

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Original Article

SUSTAINABLE DEVELOPMENT AND DEMOGRAPHIC CHALLENGES IN RURAL AREAS OF THE REPUBLIC OF SERBIA

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***Abstract**: The aim of the paper is to show the elements of a strategic approach to the sustainable development of villages in the Republic of Serbia. The subject of the study is the consideration of demographic, social and natural factors that are important for the survival and development of rural areas in Serbia, focusing on the main challenges and possible directions of agro-economically sustainable development.*
Extreme heat waves are occurring more frequent due to natural fluctuations in global temperature and careless human behavior. These undesirable climate changes have a direct negative impact on the environment. We build on previous key findings and focus on strategic considerations for sustainable rural and agricultural development in times of severe climate change.
Our two main arguments are that agricultural insurance in Serbia should follow the standards and trends of economically developed countries in the market economy in order to mitigate the risks of climate change. A growing number of insurance companies, a more active role of the government and educating farmers about the many advantages that insurance offers, but also different forms of insurance products can have a strong positive impact on the agricultural sector.
The second argument refers to non-market and heterodox approaches that draw on critical agricultural studies and critical development studies by looking for other post-growth economic frameworks for the future.

***Key words**: agriculture, climate change, neoclassical and heterodox approaches, sustainable development*

***JEL classification**: Q13, M31, F21, F23, P23*

1. INTRODUCTION

Food is an essential component of any Earthly society's culture, it is a physiological need, and it relies on the species from ecosystems. Despite having access to plenty of food, 10% of the world's population is hungry (Bliss, Egler, 2020). There are minimum two main issues regarding rural, agricultural development with sustainable food production a) climate changes affects agriculture, and b) the fact that vast scope of agriculture is pushing the Earth system beyond global sustainability thresholds. These interlinked challenges are in feedback loop relation.

An increase in global warming of 1.5˚C currently poses serious ecological challenges for the global economy. The rise in temperature can trigger a series of events that will culminate in a breakdown of the socio-ecological system, characterized by an increase in the frequency and severity of extreme weather events. These events — which include heat waves, storms, floods and droughts — are caused by the continuous use of fossil fuels and unsustainable land and energy use (Tešić, Kočović De Santo, Radosavljević, 2023). The 3.5°C increase in global warming allowed by current government policies seriously endangers both human and non-human existence. Continuous expansion intensifies the use of resources, leading to ecological deficit and debt. For this reason, vulnerable populations bear the brunt of the externalization costs of growth, and the world's unsustainable production and consumption patterns exacerbate inequality and environmental degradation.

The European Commission unveiled the European Green Deal in 2019, with the goal of making Europe the first continent to be completely climate neutral by 2050. The deal covers every aspect of the economy, including energy, transportation, agriculture, construction, steel, cement, information and communication technology, textile, and chemical industries, as well as stopping climate change, recovering lost biodiversity, and reducing pollution.

Businesses and organizations within specific industries or other homogeneous groups (sometimes referred to as the target group; examples include agriculture, industry, retail trade, and transportation) may be the cause of specific issues (like pollution) and, as a result, may be able to help solve them (e.g., by improving production processes). They also gain from favorable social, economic, or environmental circumstances (clean water is necessary for the food sector, for example).

There is no doubt that the situation of our biosphere is currently catastrophic, and the measures taken are incredibly inadequate. As a result of the widespread damage to ecosystems and their inability to absorb created waste and emissions, many of the raw materials essential to our economy — such as oil and phosphorus — are peaking (Steffen et al. 2011). This is highlighted by the phenomenon of climate change.

The frequency of disaster events is increasing due to factors such as population growth, unsustainable development and inadequate disaster management, with more than half of the world's population living in climatically vulnerable areas. The frequency of disasters worldwide is expected to rise sharply by 2030 if current trends continue (Tešić, Kočović De Santo, Radosavljević, 2023)).Further warming exacerbates existing risks, so broad-based action is needed to reduce greenhouse gas emissions and strengthen society's ability to withstand climate change. The insurance sector can be extremely helpful in reducing the impact of climate-related disasters by providing financial support and risk management capabilities.

Little progress has been made in the socio-economic sphere. Not much has been done in relation to the income stabilization measures that are permitted under the risk management toolbox. Although income stabilization measures were planned in some member states, including Spain's Castilla y Leon region, Hungary, and Italy, they have not yet been put into practice. The cultural and historical disparities among EU member states can account for a portion of the variation in crop insurance acceptance. For example, according to Zubor-Nemes at al (2018), crop insurance is partially required in Poland and Hungary. Therefore, many developed countries have introduced insurance against multiple types of risk and new insurance models such as insuring crops and yields based on weather derivatives, insuring the total value of crop production, or insuring the income derived from crop production, concludes Radosavljevic, K., (2021.).(pg. 208). Serbia has extremely good climatic and geographical predispositions for practicing organic (ecological unconventional) agriculture, but also for growing special plant and animal species, which are distinguished by their specificity and, compared to other products, make up a relatively small part of the international and world market, recommendation is Radosavljevic, K., (2017.). (pg. 163)

There are few directions, and possible modelling paths to think about agriculture within the limits i.e. within the state of emergency. What agriculture should look like to become more sustainable? What types of economic, production and consumption patterns, and market practises do we need for the future times? How mitigate the climate change risks? As such, our aim is to reveal economic and non-economic instruments and interventions, which could contribute to further sustainable food production.

Thinking in terms of agricultural insurance in Serbia is relevant, as it should hold central place in contemporary market economic logic. In such case, it should follow standards and trends of economically developed countries. What will contribute to this are an increasing number of insurance companies doing business in this market, a more active role of the government, and educating farmers in the many advantages that insurance offers.

Agricultural insurance is dependent on the nation's level of agricultural development as well as the type of insurance being used—that is, whether agricultural producers are covered by private or public insurers. In most developed countries, private insurance businesses are significantly more effective than government-run ones when it comes to crop and yield insurance. They have demonstrated greater adaptability in their operations, efficiency in resolving specific issues, and inventiveness in coming up with fresh ideas to meet the demands of service consumers in the agricultural production sector. Some nations even have public-private partnerships, like Spain.

The investigation of the feasibility of creating index-based insurance and its real-world implementation is a novel method of problem-solving. An option to the conventional approach to crop and yield insurance is index insurance, in which insurance benefits are distributed not on the performance of a specific agricultural holding but rather on average income/prices in a given area or variations in certain objective meteorological parameters like temperature, precipitation totals, concludes Turvey C.G. (2001).

On the other hand, there are various heterodox economic approaches, which we found highly important in seeking economic alternatives for sovereign, healthy, more human and sustainable food production.

Our goal is to point out the challenges and limits of agricultural development, while at the same time understanding neoclassical and heterodox economic approaches that, in combination, can provide good solutions for the transition to more economically sustainable solutions in the time of major climate challenges and changes. An important topic for future sustainable agrarian development is about the political economy and ecology of (de)growth, which are of great interest cross-sectioned with critical agrarian studies. In order to dispel the myth that economic growth always leads to more prosperity, it is necessary to answer the fundamental questions of who benefits in growth systems, what happens to poverty and the development of rural areas?

The economy is made up of more than just markets. Most ecological economists are aware of this. Occasionally, we supplement the well-known economy-in-society-in-nature with an inner "markets" domain. A common misconception is that the economy consists of only the goods and services that are created, traded, and sold. Economic practices and institutions without markets are crucial, as the Covid-19 epidemic has shown. If masks, tests, treatments, news, and scientific information were openly available to everyone, communities could more successfully restrict the virus's spread (Berger et al., 2020; Chan and Yuen, 2020; Bliss and Egler, 2020). Similar to previously, if individuals had the alternative means of obtaining food and shelter, they are less likely to have to sell their labor for a living. This made people more resilient to economic downturn without compromising their basic needs. Some examples of different non-market economic organization, as Covid-19 revealed us, are highly relevant for future thinking regarding different and more sustainable organization of food production system. While attempting to keep the Covid-19 physical distancing measure, staff and volunteers have quickly arranged “food banks” to receive large amounts of product developed for the “now-closed eateries” for the growing ranks of unemployed workers (Carson, 2020, Bliss, 2019, Bliss and Egler, 2020). In some other cases the “mutual aid collectives” were established to enable the distribution of food and resources (Milstein, 2020). The reason why it is important to study non-market economic practices and institutions i.e. non-market economies, lies i n the fact that these forms of economy are not intended for sale and transfers other than buying and selling, often completely operating without money (Bliss, 2020).

Capitalist expansion has almost reached its earthly limits, as Simone Weil rightly pointed out. However, determining the course of this change is still crucial (Weil, 1933). It is crucial to critically examine how social movements have challenged the theory of capitalist expansion i.e. how these movements relate to sustainability and degrowth principles and whether they may form coalitions. Furthermore, examining the contributions of non-capitalist smallholders provides insightful information on sustainable farming practices (Holt-Giménez Citation, 2010, Martínez-Alier et al. 2016, Borras, 2019). Finally, it is crucial to understand the rise of new ideologies and movements such as eco-spirituality, permaculture, slow food, vegetarianism/veganism, radical homemakers, back-to-the-land, alternative ideas of the good life, etc. (Greaber, J.F., 2020). These projects are the breeding ground for social change and could form the basis for a general awareness that supports alternative agro-economic thinking to mitigate the undesirable socio-economic realities that are the inspirations and doorways for a sustainable future.

2. THE INTERNATIONAL FRAMEWORKS FOR STRATEGIC SUSTAINABLE DEVELOPMENT

Considering the significance of the environment and the global issues at hand, data from the expert and scientific evidences and reports covering the years 1999–2000 were examined. With specified sustainable development strategies, we will see what the present state of affairs is based on the most recent statistics available from the UN Development Program (UNDP) as well as the fundamental issues that the current generation is facing below. The data that are being presented pertain to the year 2020 and we observe that the outcomes of 2020 were significantly impacted by the COVID-19 pandemic.

The European Union's strategy for adapting to altered climatic conditions–The strategy was adopted in February 2021, building upon the previous EU Strategy from 2013, whose primary objective is to enhance the resilience of the EU and its member states to climate change. Within the framework of the EU Strategy, member states are also called upon to adopt their comprehensive strategies and secure financial resources to implement identified/adaptation activities, as well as to strengthen national adaptive capacities. In principle, the EU insists on establishing an effective monitoring, reporting, and evaluation system, prioritizing monitoring and reporting. The EU Strategy particularly emphasizes the necessity of establishing systems for efficient adaptation at the local level, through the Climate and Energy Initiative of the Covenant of Mayors. (Covenant of Mayors for Climate and Energyinitiative). In principle, the EU insists on establishing an efficient monitoring, reporting, and evaluation system, prioritizing monitoring and reporting. The strategy has four main objectives: to make adaptation smarter, faster, and more systematic; and to enhance international action on adapting to altered climatic conditions.

The new EU legislation, which commenced implementation in 2021 in line with the Paris Agreement, introduces adaptation to altered climatic conditions for the first time.Regulation 2018/1999 mandates the inclusion of an analysis of the impact of altered climatic conditions on energy supply security in the National Energy and Climate Plans (NECPs), primarily through the availability of water for energy production facilities and the availability of biomass.

The biennial reports on the implementation of NECPs are required to include information on adaptation to altered climatic conditions. Regulation 2018/1999 also prescribes the obligation of biennial reporting on programs and strategies for adaptation to altered climatic conditions, planned and implemented actions, including:

- Basic objectives and institutional organization;
- Climate scenarios, climatic extremes, climate change impacts, vulnerability assessment, risks, and main climate hazards;
- Capacity for adaptation to altered climatic conditions;
- Plans and strategies for adaptation to altered climatic conditions;
- Monitoring and evaluation system;
- Progress in implementation, including best practices and changes in management.
- The Green Agenda for the Western Balkans includes climate action as one of its five pillars, encompassing decarbonization and adaptation to altered climatic conditions. The Western Balkan states have fully supported and adopted it, along with the regional Action Plan for its implementation, stemming from the Sofia Declaration on the Green Agenda for the Western Balkans.

3. AGRICULTURE FACING CHALLENGES

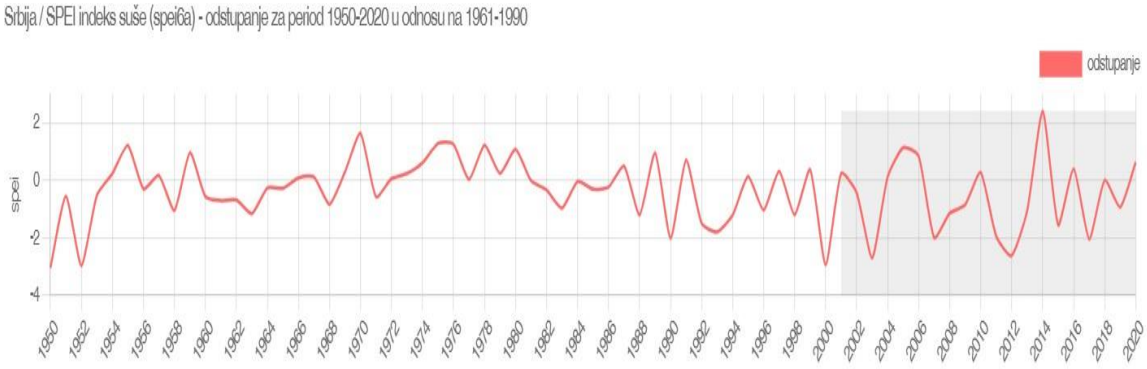
Agricultural producers can only obtain a sense of security by decreasing the amount of risk. According to Roberts R.A.J. (2005.) agricultural insurance is "a subset of risk management measures, the development of which depends on the cost/benefit ratio to the agricultural holdings or companies, as well as on the supply on the insurance market."

It may be observed that agricultural insurance generally serves two roles: it provides a more secure path to obtaining bank loans to farmers who are trying to improve their business; it helps with uninterrupted spending of agricultural holdings when they experience seasonal fluctuations caused by severe weather events conclude Ghosh, P at al (2000). According to Iturrioz R. (2009), globally, crop insurance makes up approximately 90% of the total agricultural insurance premium. Risk-averse individuals are more likely to opt into traditional agriculture (reflected as traditional seeds in the experiment) and are less likely to use modern farming inputs that require financing (high-yield varieties) despite the availability of insurance, conclude Brick, K at al (2015). The entire agribusiness system depends on agricultural insurance because it has "an important role as a measure of protection and improvement of agricultural production, conclude Sredojević, Jeločnik and Subić (2010). The factors that influence the use of agricultural insurance can be grouped into the following: risk comprehension, size of the farm, farm owner's level of education, past experiences with using insurance, income level, kind of crop, and use of inputs, conclude Wang, M, at al (2016) and Tóth, J. and Nemes, A. (2014).

The SPEI (Standardized Precipitation Evapotranspiration Index) drought index is based on the SPI (Standardized Precipitation Index) but incorporates a temperature component, allowing for the consideration of temperature's impact on drought development through the basic calculation of the water balance. SPEI has an intensity scale where both positive and negative values are calculated, identifying wet and dry

events. For the platform's purposes, the period used for calibrating the index is 1961. - 1990. years.

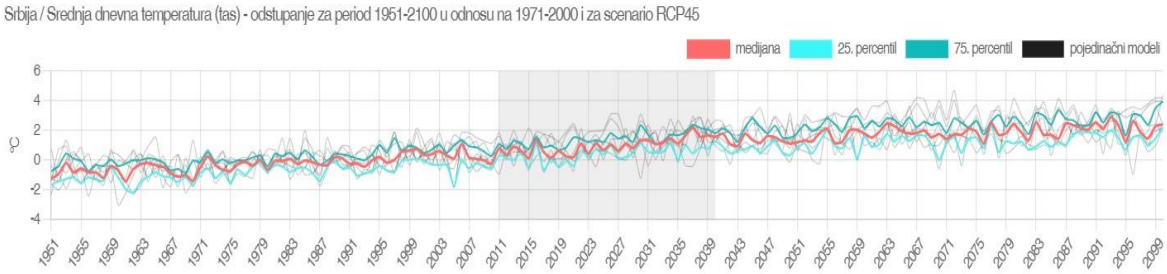
Graph 1. Republic of Serbia drought index - deviation for the period 1950. – 2020. compared to 1961. – 1990.



Source: https://atlas-klime.eko.gov.rs/lat/map

Graph 1. represents future changes (climate projections) when observed as a variable mean daily temperature, with the reference period being 1971. – 2000. years and the period of observed changes being 2011-2040 years for the Republic of Serbia. These data are generated based on the results of climate models for various scenarios of future greenhouse gas emissions.

Graph 2. Mean daily temperature deviation for the period 1951. – 2100. compared to 1971. – 2000.

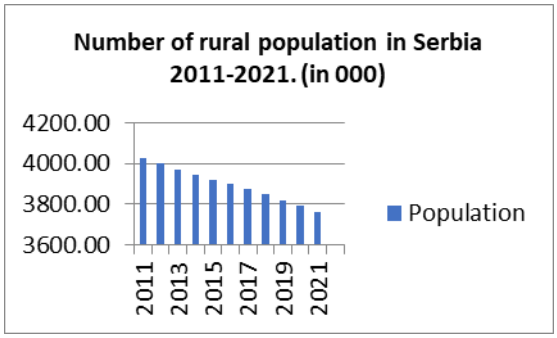


Source: https://atlas-klime.eko.gov.rs/lat/map

In the long run, the development of agricultural insurance depends on finding a means of encouraging farmers to utilize insurance products. To this end, the government must play a more active role, and local governments must also be included. Furthermore, the collaboration of the three parties involved—the government, farmers, and insurance companies—is crucial.

The trend of constant decline in the number of rural population in Serbia is another major constraint to the development of Serbian agriculture. Graph 3 represents the movement of rural population for the period 2011–2021. From 4,028 thousand in 2011, the number of rural population reached a figure of 3,760 thousand in 2021.

Graph 3. Rural Population in Serbia 2011. – 2021. (in 000)



Source: https://www.fao.org/faostat/en/#data

The demographic and migration issues that our nation is facing are the result of poverty, natural and migratory movements, and a decline in the overall population of the Republic of Serbia. Many other socioeconomic issues, including poverty and social isolation, regional disparities

and inequities, a lack of local initiative and competitiveness, and a loss of cultural identity, are attacking rural communities.

CONCLUSION

Crop and yield insurance against multiple/all the sources of risk could provide more comprehensive protection for future agricultural investments. Since this type of insurance would help protect the continuity of agricultural producers' purchasing power, produce capacity, and ability to settle their immediate liabilities on time, it could also act as a protective mechanism for the national economy. One possible barrier to the introduction of this kind of insurance is how insurance companies would pay for its implementation without jeopardizing their business's profitability. A percentage of the expenses would need to be covered by the government in order to resolve this problem.

Alongside fostering innovation in climate solutions, the insurance sector can alleviate the strains imposed by contemporary capitalism by advocating for sustainable practices and extending insurance coverage to the most vulnerable segments of society. Offering crop insurance to farmers and flood insurance to residents in high-risk zones not only mitigates losses and facilitates economic recovery post-natural disasters but also incentivizes responsible resource management practices essentially important for sustainable rural and agricultural development. Insurance products safeguarding natural resources like forests, fisheries, and biodiversity encourage their sustainable utilization, thereby curbing over-exploitation and safeguarding livelihoods dependent on them. In terms of the economy, insurance strengthens financial resilience by cushioning unforeseen costs. Insurance helps reduce poverty by guaranteeing business continuity and preserving employment opportunities. In essence, the insurance industry is becoming a key player in reducing the risks associated with climate change and addressing the difficulties of modern capitalism. Such unique perspectives allow for a deeper understanding of climatic processes and lead to the development of new types of goods. In navigating modern capitalism, the insurance industry is championing the interests of the most marginalized by supporting environmentally friendly measures and offering tailored protection plans such as microinsurance and natural resource protection goods (Tešić, Kočović De Santo, Radosavljević, 2023, Vujanović, Kočović De Santo, 2023).

Determining the method of government support for farmers. Based on other countries' experiences, subsidizing the cost of insurance, that is, the premiums that farmers pay to insurance companies has shown to be the best form of support, keeping in mind that the subsidized amount must be acceptable to both the government and the agricultural producers. Additionally, for young farmers who wish to remain in rural areas and continue to work in agriculture the premiums should be higher and, if the government budget allows, should be 100% subsidized for the first 5 or 10 years.

The insurance of agricultural production contributes to the economic stability of crop and livestock production by providing protection to agricultural producers and creating a surplus reserve for insurance companies via premiums paid. The positive effects of insurance in agricultural production will reflect on future potentials for agricultural development as well as the competitiveness of the national economy.

According to Mihailovic at al (2023), achieving the full potential of agricultural production requires the establishment of cooperation between local producers, institutions and companies (pg. 147). In the current discussion on growth and agricultural constraints, Critical Agrarian Studies (CAS) and degrowth overlap as an important field of study (McGreevy, S.R et.al. 2022). Moreover, analyzing the contributions of non-capitalist small-scale farmers yields valuable insights into sustainable agricultural methods. Additionally, it is imperative to grasp the emergence of novel ideologies and movements like eco-spirituality, permaculture, slow food, vegetarianism/veganism, radical homemakers, back-to-the-land, and alternative concepts of well-being. These initiatives serve as catalysts for societal transformation and could lay the groundwork for widespread awareness that fosters alternative agricultural-economic paradigms, thereby mitigating the adverse socio-economic conditions that inspire and facilitate a sustainable future.

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Original Article

THE IMPACT OF FEAR OF THE COVID-19 VIRUS ON THE ORGANISATIONAL COMMITMENT OF TEACHING STAFF FROM THE PERSPECTIVE OF SOCIO-DEMOGRAPHIC FACTORS

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***Abstract**: The COVID-19 pandemic caused major changes in the way employees in almost all areas of work performed their working tasks. This pandemic also had health and safety implications for them, causing a natural fear for their health and even their lives. The employees in the education system were not exempt. The fear of COVID-19, however, is associated with many negative impacts. One of the work-related attitudes on which the impact of fear of COVID-19 is important to examine is organisational commitment, as it has an influence on many other employees' attitudes and behaviours at the workplace and, in the end, on job performance. Since there is evidence that people differently face the fear in general, the aim of this paper is to find out whether there are differences in organisational commitment in the state of the fear of the COVID-19 pandemic among the teaching staff depending on socio-demographic variables such as gender and marital status. To realise the above objective, empirical research on a sample of 164 respondents was conducted. Descriptive statistics and a two-factor MANOVA were used to test the hypothesis. The research results showed that there is a significant effect of gender and marital status on the relationship between fear and organisational commitment among the teaching staff. These results could serve as a base for tailoring support for employees in the education system when faced with challenging and threatening working conditions that may occur in the future.*

***Key words**: COVID-19 virus, fear, organisational commitment, high school teachers.*

***JEL classification**: H75, I1, M54*

1.INTRODUCTION

The pandemic of the coronavirus COVID-19 had a significant impact on the ways people lived, worked, connected, travelled, and did every-day activities (Kolarova, Eisenmann, Nobis, Winkler, and Lenz, 2021; OECD, 2021). The educational system was also under its strong influence. According to some researchers, „sixty-one countries in Africa, Asia, Europe, the Middle East, North America, and South America have announced school closures and were forced to convert to online teaching platforms" (Nurunnabi, Almusharraf, and Aldeghaither, 2020). Besides the challenges that teaching staff faced regarding the acquisition of the new digital skills, they also experienced a greater or lesser extent of fear of this virus, which threatened their health and safety.

After the "lockdown" that was announced in many countries was finished, the threat of the virus COVID-19 still existed for a long period of time,

and many restrictions in the public sphere were still on the line.

In order to examine the impact of fear of COVID-19 on the mental health of people, many empirical studies were conducted all around the world. In most of them, negative consequences of the fear of COVID-19 on the mental health of people were found (Nurunnabi et al., 2020).

In addition to the empirical studies that examined the influence of the fear of COVID-19 on the mental health of people, some empirical studies were aimed at investigating the influence of the fear of COVID-19 on work-related attitudes, behaviours, and performances (Abd-Ellatif, Anwar, AlJifri, and El Dalatony, 2021; Shaheen, Zulfiqar, Ahmad, and Ahmad-ur-Rehman, 2022; Sarwar, Abdullah, Imran, and Fatima, 2023). However, one of the organisational variables that did not gain sufficient attention among the authors' was organisational commitment. Yet, this variable is very important to examine in this context, as it has the potential to influence many other employees' attitudes and behaviours and, in the end, job performances (Memari, Mahdieh, and Marnani, 2013; Faloye, 2014).

Since the educational system was one of the systems that mostly suffered during the pandemic, the fear of COVID-19 and organisational commitment will be examined in the sample of high school teachers. In order to get a deeper insight into the organisational commitment in the state of fear of COVID-19, the influence of socio-demographic factors, such as gender and marital status, on the respondents will be examined. In other words, the subject of the paper is investigating the effect of gender on fear of the COVID-19 pandemic and organisational commitment, depending on the marital status of the high school teachers.

The results of the paper have theoretical and practical implications. Theoretical implications refer to filling the gap in the literature by adding new insight into the organisational commitment in the state of fear of the COVID-19 pandemic, which has not been examined in the literature so far, while practical implications refer to the recommendations that will be made for policymakers regarding supporting measures for employees in the education system for effective coping with similar threats that could occur in the future.

The structure of the paper is as follows: after reviewing the literature regarding the fear of COVID-19 and organisational commitment, a hypothesis that is going to be tested will be developed. In the methodology of research part, the context of the research, the sample, measurement scales, and statistical analysis will be explained. After this part, the results of the study and their discussion will be presented, while at the end of the paper, some concluding remarks will be made.

2. LITERATURE REVIEW

2.1. Fear of COVID-19

The spread of the coronavirus COVID-19 world-wide a couple of years ago caused dramatic changes in the ways people work, travel, and do their daily activities (Kolarova et al., 2021; OECD, 2021). The pandemic of this virus caused for public health care systems in most countries in the world the biggest challenge they faced ever (Filip, Gheorghita Puscaselu, Anchidin-Norocel, Dimian, and Savage, 2022). In order to cope with this challenge, many governments implemented various mechanisms, such as the quarantine measures, closeness of educational institutions, travel restrictions, social distancing, and the mandatory wearing of face masks in public places etc. (Şimşir, Koç, Seki, Griffiths, 2022).

Despite all the measures that were undertaken, most people worldwide experienced a fear of this unknown disease. This kind of fear is commonly conceptualised as an emotion experienced when individuals face the probability of a COVID-19 virus infection (Ahorsu et al., 2020). In other words, people all around the world were afraid of the possibility of being infected with this virus.

In order to examine the consequences of fear of COVID-19 on people, many empirical studies have been conducted so far. Some of these studies have focused on the impact of fear of COVID-19 on the mental health of people, while others were aimed at investigating this influence on employee attitudes and behaviour at the workplace.

In the studies that were conducted to examine the influence of fear of COVID-19 on the mental health of people, a wide range of mental health problems were identified, such as anxiety (Mahmud, Talukder, and Rahman, 2021), depression (Voitsidis et al. 2020), and insomnia (Chaturvedi, 2020; Mertens, Gerritsen, Duijndam, Salemink, and Engelhard, 2020). It was also found that as the fear of COVID-19 levels of individuals increased, their psychological symptoms also increased (Taylor et al., 2020). According to some researchers, mental health did not improve 6 months after the lockdown was finished implies that these negative consequences have a long-term impact.

In the studies that were aimed at investigating the effects of COVID-19 on work-related attitudes and behaviours, negative consequences were also found. The negative impact was found on the work engagement of employees (Shaheen et al, 2022), their job satisfaction, and turnover intentions (Abd-Ellatif et al., 2021). In addition, it was also found that fear of COVID-19 caused emotional exhaustion among employees, which in turn negatively affected their work performance (Sarwar et al., 2023).

For the purpose of measuring the fear of COVID-19, several scales were developed. One scale that has been widely used is the Fear of COVID-19 scale developed by Ahorsu et al. (2020). This scale was also used in this paper. The other scales for fear of COVID-19 measurement are the Fear of the Coronavirus Questionnaire (Mertens, Gerritsen, Duijndam, Salemink, and Engelhard, 2020), COVID Stress Scales (Taylor et al., 2020), and the single-item instrument "How would you currently rate your fear of COVID-19?" (Fitzpatrick, Harris, and Drawve, 2020), etc.

2.2. Organisational commitment

Organisational commitment is one of the most important work-related attitudes that employees have towards their organisations. It was introduced in the literature in the 1970s of the 20th century (Steers, 1977), and many definitions regarding this construct have been developed so far.

According to some authors, organisational commitment is the psychological attachment of workers to their workplace (Becker, Billings, Eveleth, and Gilbert, 1996). According to others, organisational commitment has a broader meaning, and they see this construct as the degree to which employees identify with the organisation where they work, the degree of commitment they show, and whether they are willing to leave it (Greenberg, and Baron, 2008). Some authors stress other aspects of organisational commitment, as they say that it is the degree to which people are involved with their organisations and are interested in remaining with them (Memari et al., 2013).

Having in mind the previously defined definitions, it can be concluded that this is a multidimensional concept. This fact was familiar to Mayer and Alen, who, at the beginning of the 1990s created a three-dimensional model of organisational commitment (Meyer, and Allen, 1991). This model consists of three types of commitment: affective, normative, and continuance commitment. Affective commitment refers to the employee's positive emotional attachment to the organisation; normative commitment refers to the feelings of obligation to stay within the organisation; and continuance commitment refers to the perception that the costs of leaving the organisation will be high. Speaking in general, Mayer and Alen state that organisational commitment is a psychological state that characterises organisational members' relationships with the organisation and has implications for the decision to continue or discontinue membership in the organisation (Meyer, and Allen, 1997).

Since the tradition of investigating this concept has lasted for more than 50 years, it has been widely documented that this construct has an influence on many other relevant work-related attitudes and behaviours, such as organisational citizenship behaviour (Asiedu, Sarfo, and Adjei, 2014), job performance (Memari et al., 2013), turnover intentions (Faloye, 2014), etc. It is also found that organisational commitment is influenced by numerous factors. Among the mayor are: job satisfaction, leadership style, organisational climate (Ariffin, and Che Ha, 2014), working conditions (Khalili, and Asmawi, 2012), etc.

Regarding the last factor, it was found that a comfortable environment can increase the morale of employees on the job and, consequently, their organisational commitment (Ch, Zainab, Maqsood, and Sana, 2013). On the contrary, if the working conditions are not satisfactory, there is a great probability that the organisational commitment will be lower.

Despite the fact that working conditions are an important factor in organisational commitment, the influence of the working conditions associated with the fear of COVID-19 on organisational commitment did not gain sufficient attention from the authors. Therefore, to provide more comprehensive insight into organisational commitment in the conditions of the fear of COVID-19, empirical research was undertaken, and the results are presented in this paper. Special attention in this research was put on the influence of socio-demographic characteristics of the respondents on the relationship between *fear of COVID-19 and organisational commitment.*

3. HYPOTHESIS DEVELOPMENT

In the previous period, many empirical studies that examined the influence of socio-demographic variables on organisational commitment have been conducted so far, but with mixed results.

When it comes to the influence of gender, in most of the studies, no significant differences among females and males upon organisational

commitment were found (Khalili, and Asmawi, 2012). Yet, in some studies, differences based on gender were found when it came to the level of commitment, types of commitment that were higher, etc. (Khalili, and Asmawi, 2012; Ch et al., 2013). These mixed results indicate that there are many situational factors that moderate the relationship between this demographic variable and organisational commitment.

When it comes to the relationship between marital status and organisational commitment, it was found that marital status has emerged as a consistent predictor of organisational commitment (Tikare, 2015). As married people have more family responsibilities and need more stability and security in their jobs, they are likely to be more committed to their current organisation than their unmarried counterparts (Peng et al., 2022).

When it comes to the differences in fear of COVID-19 based on gender, studies mostly confirmed that women expressed a higher level of fear than men (Alsharawy, Spoon, Smith, and Ball, 2021). In addition, it was also found that throughout the first year of the pandemic, women experienced a greater fall in mental health and felt lonelier than men (OECD, 2021).

When it comes to investigating the differences in fear of COVID-19 upon marital status, there have not been such studies so far, but some conclusions could be found in the studies that investigated the differences in well-being during the pandemic of COVID-19 upon marital status. It was found that married women reported significantly lower wellbeing than married men, but it was also found that the wellbeing of single females was significantly lower than both married women and men (Peng et al., 2022).

Based on the above, the hypothesis that will be tested in this paper is as follows:

H1: The effect of gender on fear of the COVID-19 pandemic and organisational commitment is different depending on marital status.

4. METHODOLOGY OF RESEARCH

Context of the research and the sample. In Serbia, the majority of high schools are established and run by the government. Hence, this only state-owned high schools were selected as the research sample for this study. The pilot study targeted teaching staff exclusively. A total of 164 respondents were invited via school institutional emails, and their anonymity was ensured by the researchers. The survey was conducted during 2023, using Google Forms as the online tool for distribution. It was emphasized to the respondents that when answering, they have in mind the period from March 2020 to March 2021. In Table 1 sociodemographic characteristics are presented.

Table 1. Sociodemographic characteristics of the respondents

Characteristic	Category	N	%
Gender	Female	125	76.2
	Male	39	23.8
Age	< 25	2	1.2
	26 - 40	39	23.8
	41 - 55	90	54.9
	> 55	33	20.1
Marital status	cohabitation	8	4.9
	unmarried	34	20.7
	married	100	61.0
	divorced	17	10.4
COVID-19 disease	Yes	110	67.1
	No	54	32.9
Hospitalisation	Yes	7	4.3
	No	157	95.7

Source: Authors

Women (76.2%) took part in the research in comparison to men (20.6%). A little more than half of the respondents (54.9%) are in mature age (from 41 to 55 years old). About a fifth of respondents (20.1%) are over 55 years old. Almost two-thirds of respondents (61.0%) are married, and about a fifth of respondents (20.7%) have never married. About two-thirds of the respondents (67.1%) were infected with COVID-19, and only 4.3% were hospitalized during the infection.

Measurements. The questionnaire comprises three sections. The initial section aims to gather demographic information from respondents. The subsequent parts focus on evaluating high school teachers' level of fear of COVID-19 disease and organizational commitment.

To measure the level of fear of COVID-19 the fear of COVID-19 Scale (FCV-19S) was implemented (Ahorsu et al., 2020). The scale consists of seven items measuring the level of fear of COVID-19 using Likert scale ranging from (1) totally disagree to (5) totally agree. The one item used is "I am scared a lot of COVID-19."

To measure organisational commitment, the questionnaire developed by Allen and Meyer (1990) was applied. This variable was measured in general terms, not separately by subvariables such as affective, continuance, and normative commitment. Each commitment type was represented by six items, rated on a 5-point Likert

scale ranging from "strongly disagree" to "strongly agree." For example, one adapted statement for affective commitment is: "I do not feel a strong sense of belonging to this organization." In terms of continuance commitment is: "Right now, staying with my job at this organization is a matter of necessity as much as desire." Lastly, one statement measuring normative commitment is: "I would not leave my organization right now because of my sense of obligation to it." All explored variables demonstrated satisfactory reliability, as assessed by Cronbach's alpha coefficient (Table 2). The validity of the fear of Covid-19 is below the limit of good validity ($\alpha<0.7$), but it can be considered acceptable.

Statistical analysis. SPSS version 23 was employed to apply suitable statistical methods to the data collected from the study questionnaire responses. Descriptive statistics including means, frequencies, and standard deviations were utilized in the study report to examine the research areas. In order to test whether there are differences by gender and marital status in relation to commitment to the organization and fear, a two-way MANOVA was used (Johnson, and Wichern, 2007; Kline, 2011; Daniel, 2016). The dependent variables in the model are organizational commitment and fear of COVID-19.

5. RESEARCH RESULTS

Values on the scale of fear and organizational commitment were calculated using the regression method in the confirmatory factor analysis procedure, taking into account the assumed structure of each of the factors examined by the questionnaire. The factor scores obtained in this way are a linear combination of empirical variables that takes into account the correlation between factors, factors and questions (items), as well as the correlation between questions (items).

Table 2. Descriptive statistics of fear and organizational commitment

Item	M	Me	Mo	SD	Skewness	Kurtosis	Min.	Max.	Cronbach`s α
Fear of COVID-19	1.933	1.731	1.279	0.740	0.997	0.084	1.263	4.145	0.618
Organizational Commitment	3.442	3.588	0.970	0.958	-0.494	-0.250	0.968	5.101	0.862

Source: Authors

Descriptive statistics. In Table 2, descriptive statistics of the sample is presented. We can conclude that on average, fear is weakly expressed among employees (M = 1.93; SD = 0.88). Half of the respondents have a score of 1.73 on the fear scale, and half more. The most common score in the distribution is also low (Mo = 1.28).

Also, on average, teachers are most committed to the organization (M = 3.44; SD = 0.96), and least afraid (M = 1.93; SD = 0.74). Half of the respondents have a score of 3.59 on the scale of commitment to the organization, and half have more. The most common result in the distribution is low (Mo = 0.97).

The distribution of scores on the fear scale is skewed to the right (Skewness is 1.00) and slightly peaked (Kurtosis is 0.08). The Shapiro-Wilk test indicates that the distribution of scores on the fear scale cannot be considered approximately normal, $W(164) = 0.84$; $p < 0.001$.

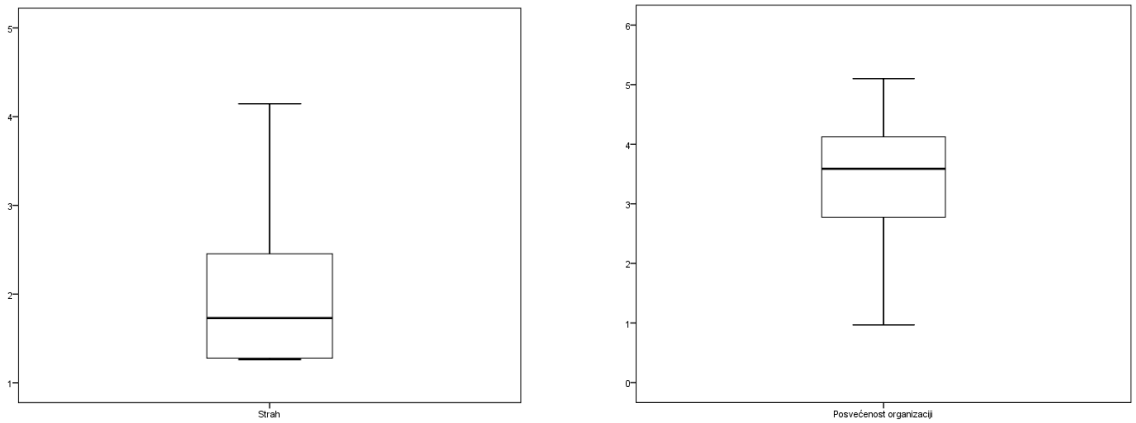
The distribution of scores on the organizational commitment scale is skewed to the left (Skewness is -0.49) and flattened (Kurtosis is -0.25). The Shapiro-Wilk test indicates that the distribution of scores on the organizational commitment scale cannot be considered approximately normal, $W(164) = 0.97$; $p = 0.002$.

MANOVA assumptions testing. The dependent variables in the model are organizational commitment and fear, while independent variables in the model are gender and marital status. Gender is a dichotomous variable. Marital status is categorized as follows: common-law or married and those who are not in a union (single, divorced and widowed).

Assumptions for the use of MANOVA test were preliminarily tested: normality, presence of extreme values, linearity, multicollinearity, singularity and homogeneity of variance-covariance matrices.

The presence of multivariate extreme values in the data was tested using Mahalanobis distances. No multivariate extreme values were observed. The critical value of Mahalanobis distance for 2 dependent variables is 13.82. The maximum Mahalanobis distance value in the data is 9.37.

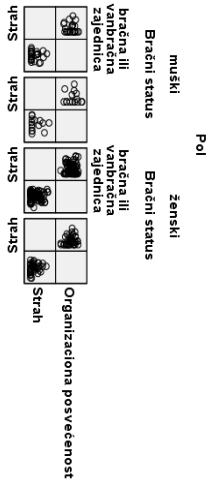
The presence of univariate extreme values in the data was checked using a boxplot (Picture 1).



Picture 1. Box plots
Source: Authors

As can be seen in Picture 1, there are no univariate extreme values for any dependent variable.

Linearity was checked using a scatter plot. Using the diagram, it was checked whether there is a linear relationship between each pair of dependent variables in each category of the independent variable (Picture 2).



Picture 2. Linearity
Source: Authors

No violation of linearity assumptions was observed in Picture 2.

Multicollinearity of the dependent variables was checked using the Pearson correlation coefficient. There is a positive and weak correlation between fear and commitment to the organization, but it is not significant, r (164) = 0.08; p = 0.34.

The assumption of equality of variance was checked by Levene's test (Table 3).

Table 3. Result of Levene's test of homogeneity of variance

Item	F	df1	df2	p
Fear of COVID-19	3.345	3	160	0.021
Organizational Commitment	1.839	3	160	0.142

Source: Authors

Table 3 shows that the assumption was violated for the dependent variable fear, $p < 0.05$. The assumption was not violated for the dependent variable of commitment to the organization, $p > 0.05$ (Table 3).
The assumption of equality of the covariance matrix is not violated, Box M = 31.01; p = 0.18.

Results of the two-factor MANOVA. In order to test proposed hypothesis, the two-factor MANOVA was applied. The results of two-factor MANOVA test are presented in Table 4.

Table 4. Descriptive statistics of fear and organizational commitment

Item	Fear of COVID-19				Organizational Commitment			
Gender	Female		Male		Female		Male	
	Not in marriage/relationship	Marriage/Relationship	Not in marriage/relationship	Marriage/Relationship	Not in marriage/relationship	Marriage/Relationship	Not in marriage/relationship	Marriage/Relationship
M	1.962	2.042	1.629	1.694	3.364	3.561	3.732	2.976
SD	0.760	0.790	0.522	0.540	0.983	0.875	0.777	1.162

Source: Authors

According to the results presented in Table 4 we can state that:

- There is a significant interaction effect of gender and marital status on the combination of fear and commitment to the organization, $F(2, 159) = 0.04$; $p = 0.03$; Pillai's Trace = 0.01; partial $\eta^2 = 0.04$.
- There is a significant effect of gender on the combination of fear and commitment to the organization, $F(2, 159) = 3.09$; $p = 0.03$; Pillai's Trace = 0.048; partial $\eta^2 = 0.04$.
- There is no significant effect of marital status on the combination of fear and organisational commitment, $F(2, 159) = 1.40$; $p = 0.25$; Pillai's Trace = 0.01; partial $\eta^2 = 0.02$.
- When the dependent variables are considered individually, there is no significant interaction effect of gender and marital status on fear; $F(1) = 0.003$; $p = 0.96$; partial $\eta^2 < 0.001$.
- There is a significant interaction effect of gender and marital status on organizational commitment; $F(1) = 7.11$; $p = 0.01$; partial $\eta^2 = 0.04$.
- Men who are not married have the most pronounced organizational commitment ($M = 3.73$; $SD = 0.78$).
- Women who are in a married or cohabiting union ($M = 3.56$; $SD = 0.88$) have higher organizational commitment compared to women themselves ($M = 3.36$; $SD = 0.98$) and men in a married or cohabiting union ($M = 2.98$; $SD = 1.16$).

Based on the previously presented data we can conclude that proposed research hypothesis is confirmed. In other words, there is significant interaction effect of gender and marital status on the combination of dependent variables – the fear of COVID-19 and the organizational commitment.

6. IMPLICATIONS

The results of the study provide the foundation for some recommendations that could be made to the authorities. When it comes to policymakers, in order to provide better coping for employees in the education system with similar situations that might occur in the future, several measures, such as trainings for dealing with stress, guidelines related to health and well-being, and trainings in alternative teaching methods that are based on or not on the internet, could be implemented.

The management of educational institutions should consider different ways to create a positive organisational culture and climate that will encourage a positive attitude towards the institutions.

The implications of this paper are scientific as well. Namely, this paper provides a new insight into the effect of fear of the COVID-19 virus on the organisational commitment of the teaching staff, which has not been the focus of the authors so far. In addition, by focusing on the impact of gender and martial differences on the relation between the fear of COVID-19 and organisational commitment, scientifically based supporting measures for dealing with the fear of health could be made.

CONCLUSION

This paper dealt with the impact of fear of COVID-19 from the perspective of socio-demographic variables such as gender and marital status. It has been stressed that fear of COVID-19 has many negative consequences related to mental health and work-related attitudes and behaviours, where organisational commitment is one of the most important.

For the testing of the hypothesis that the effect of gender on fear of the COVID-19 pandemic and organisational commitment depends on marital status, empirical research was done. The results showed that there is a significant interaction effect of gender and marital status on the combination of dependent variables – the fear of COVID-19 and organisational commitment. In addition, it was found that men who are not married have the highest level of organisational commitment on one side, but on the other, women who are married or live in cohabiting unions have higher organisational commitment compared to women themselves and men who are married or live in cohabiting unions.

Although this paper has some contribution to science and practice, it has some limitations as well. They refer to the sample size, which is not representative, which further leads to the fact that the conclusion in this paper cannot be generalised. In addition, the survey was realised two years after the lockdown in Serbia ended, so the respondents may not have provided adequate answers.

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DEMOGRAPHIC CHALLENGES OF THE PENSION SYSTEM IN THE REPUBLIC OF SERBIA

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Abstract: *The crisis in pension systems is present in all countries worldwide. In European Union countries, it is evident that the design of pension systems varies significantly among member states, and generating distinctions between them leads to their different sustainability. The main factors influencing the crisis in pension system functionality are cited as the pronounced longer trend of life expectancy than expected, global economic crises, high unemployment rates, globalization, competition in the pension insurance sector, forms of pension benefit payments, as well as the structure of pension expenditures. This paper analyzes the demographic challenges of the pension system of the Republic of Serbia, focusing on the structure of pension expenditures as the dominant and most important category of expenditures of the Pension and Disability Insurance Fund. The paper aims to highlight the most important factors of pension system sustainability. The research results have shown statistically significant differences in average pension amounts among different categories of pension beneficiaries, thereby endangering the financial stability of the pension system of the Republic of Serbia. In the final part of the paper, possible directions for reforming the pension system of the Republic of Serbia are indicated.*

Key words*: pension system, pension reform, demografic challenges, financial stability, Republic of Serbia.*

JEL classification: *H5, H6, H55*

1. INTRODUCTION

In scholarly discussions about the reasons behind the crises in national pension systems, considerable focus has been directed towards the disrupted ratio of workers to retirees. This disparity has profoundly affected the viability of existing pension frameworks. Additionally, the frequent modifications to pension systems globally have been driven not only by deficiencies in pension policy management but also by concerns over social viability.

An assessment of the actuarial shortfall, defined as the gap between pension costs and contribution revenues, suggests that the fiscal viability of most EU Member States is threatened. Over a period of 50-75 years, contributions and other revenues are inadequate to cover the anticipated pension payouts (D`Addio and Whitehouse, 2012). Another concern frequently noted in economic studies is social viability, a concept far more encompassing than just financial viability. Social viability refers to the adequacy of pensions, namely, the proportion between pension amounts and the pre-retirement earnings of the insured. Crafting durable pension systems requires attention to factors influencing both financial and social viability. Thus, it's crucial to evaluate the impacts of pension policies on these aspects during system reforms, aiming to harmonize these

objectives. Achieving this necessitates a thorough examination of pension revenues and expenses.

Globally, the compulsory pension system grapples with significant challenges, primarily the rising ratio of retirees to workers. Specifically, a key reason for pension payment deficits is the dwindling pension system revenue coupled with soaring pension costs. An increase in pension expenses highlights not just the growing number of retirees but also the progressively lenient retirement eligibility criteria. Forecasted pension expenses up to 2050 in most EU nations indicate that the current pension contributions will fall short of meeting these costs (European Commission, 2009). In Serbia, pension expenses constitute the largest expenditure category for the Republic Pension and Disability Insurance Fund, comprising about 85% of the Fund's total expenses.

However, Serbia's pension system is not sustainable over the long term, prompting many scholars to advocate for reforms (Đurović-Todorović and Đorđević, 2018). Addressing the financing issues of pensions and exploring sustainable operations of Serbia's pension system involved a detailed examination of pension expense structures. This study reviews the correlation between pension recipients, pension types, and pension amounts. The data for this empirical analysis were sourced from the Republic Pension and Disability Insurance Fund-Leskovac Branch, focusing on pension expenditure patterns at the city level. Given that opportunities to cut costs in the compulsory state pension and disability insurance system for certain pensions are nearly depleted, it is vital to explore alternative measures and opportunities for redesigning Serbia's pension disability system locally.

Acknowledging that the unsustainability of state pension systems stems from a misalignment between pension system designs and contemporary changes, this research provides a comprehensive overview of the structure and scale of local pension expenditures and potential reform directions for Serbia's pension insurance system.

2. ECONOMIC DRIVERS OF INSTABILITY IN PENSION SYSTEMS

The pervasive crisis in pension systems manifests globally, with notable variations within the European Union due to differing pension system architectures among Member States, which contribute to disparities in sustainability outcomes (Hadi et al., 2022).

Crucial determinants exacerbating the pension system crisis include the extended longevity of populations surpassing forecasts, global economic downturns, elevated unemployment levels, the effects of globalization, competitive dynamics in pension insurance, and the modalities of disbursing pension benefits. Rakonjac-Antić (2013) posits that for pension schemes to function effectively, all potential pension benefit disbursement methods must be proactively considered. Moreover, the method of determining pension benefits is pivotal for the operational effectiveness of pension systems. "The classification into defined benefit plans, defined contribution plans, and hybrid plans hinges on whether pensions are calculated using a pre-set formula with specific parameters or based on the size of accumulated contributions and returns on these investments" (Rakonjac-Antić, 2013, p. 128).

Holzmann et al. (2003) identify that the pension systems crisis is influenced by the weak linkage between pension contributions and benefits, which necessitates strengthening, as well as factors tied to pension funding sources, such as contribution duration and funding mechanisms. This author underscores the critical need for structural modifications in pension schemes.
Matković (2010) examines the effect of the number of pension recipients on net pension expenditures. The author attributes a decline in revenue to a reduction in the insured workforce due to decreased employment, evasion of contributions, and the informal economy, while an uptick in expenses results from an increase in pension recipients, driven by population aging and more lenient retirement conditions (Matković, 2005).

The complexity of pension system operations is acknowledged by both international and national statistical bodies as well as academic research institutions. According to Stanc et al. (2019), the pension system is influenced by demographic policy, intergenerational equity, national economic equilibrium, public debt levels, and macroeconomic stability. "Challenges such as aging populations, declining employment rates, and financial market fluctuations critically threaten pension system sustainability," state Stanc et al. (2019, p. 53). These authors contend that any examination of the sustainability of retirement and disability insurance must initially tackle at least three demographic challenges over the forthcoming four decades: population decline, aging, and emigration, all of which jeopardize pension system sustainability. Dobre et al. (2012)

argue that maintaining manageable public debt levels is essential for addressing future public expenditure increases driven by demographic shifts. Peter Askins (2010) discusses the sustainability and risk challenges confronting pension policymakers, emphasizing the urgency for reform in Europe in response to aging populations and falling birth rates.

Barr et al. (2009) suggest that pension system design principles are deeply rooted in economic theory, encompassing multiple objectives and considering the pension system in its entirety. Different systems face varied risks and impacts across generations and genders. The dialogue surrounding these principles intensifies with the emergence of flaws in World Bank analyses and incomplete evaluations of pension liabilities and systems. The author emphasizes the necessity of comprehensive analyses of pension systems that vary with the economic development levels of different countries.

Research also highlights the critical timing of retirement, proposing that resolving the pension crisis requires evaluating the optimal retirement age. Defining retirement age necessitates starting from the foundational definition of retirement, though consensus on this definition remains elusive in academic literature (Gustman, Mitchell and Steinmeier, 1995). Montalto et al. (2000) explore determinants of retirement age, suggesting that retirement adequacy studies should prioritize anticipated retirement planning. Financial advisors are advised to account for the increasing propensity for planned retirement among various beneficiary categories with advancing age. The study focuses on the financial and demographic attributes of pensions as key determinants of the retirement threshold. Boskin (1977) indicates that net earnings levels significantly negatively influence retirement likelihood. Stojilković (2011) integrates metrics such as years of service and average retirement age into analyses of retirement structures in Serbia, noting the critical role of average retirement age for the financial sustainability of the Pension and Disability Insurance Fund. Given the increasing life expectancy at retirement, prolonged pension utilization is anticipated. “Data from the Pension and Disability Insurance Fund indicate long-term trends influenced by demographic and socio-economic factors, including those affecting retirees” (Stojilković, 2011, p. 69).
In Serbia, as in many other nations, pension and disability insurance relies partially on ongoing financing of pensions. Mandatory insurance encompasses employees, employers, self-employed individuals, and farmers. By the late 2000s, significant debts had accumulated within Serbia’s pension and disability system, compounded by workforce reductions, contribution avoidance, and a shrinking insured population since the mid-1980s, escalating through the 1990s. The rise in the number of pensioners, driven by liberal retirement policies and an aging population, has consistently elevated pensioner numbers.

3. DATA COLLECTION AND ANALYTICAL METHOD

Since 2012, the Republic of Serbia has structured its pension disbursements to encompass allocations for employees, self-employed entrepreneurs, agricultural workers, and military personnel. To enhance the accuracy of the analysis, data on pension allocations were systematically gathered at the municipal level (Đurović Todorović et al., 2021).

The investigation employed primary data sourced from the Republic Pension and Disability Insurance Fund, specifically its Leskovac Branch, complemented by secondary data from the Fund's monthly statistical release and aggregate statistics from the Republic Bureau of Statistics.
This analysis delineated the allocation of pension recipients within the Pension and Disability Insurance Fund in Leskovac by exploring the following classifications: beneficiaries identified as employees, agricultural workers, self-employed entrepreneurs, and military insured.

Table 1. Descriptive Statistics

Dependent Variable: ПП

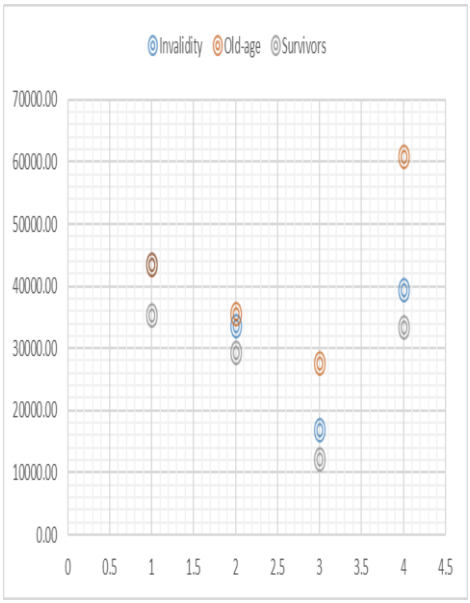
	Type of pension	Mean	Std. Deviation	N
Invalidity	Employees	43637.8335	26635.06196	22
	Craftsmen	33602.2745	17118.06127	17
	Agricultural workers	16865.7046	9198.83879	5
	Military	39533.4879	15893.45607	16
	Total	37468.9222	21390.61950	60
Old-age	Employees	43584.6308	26581.51677	22
	Craftsmen	35585.2204	17426.69543	19
	Agricultural workers	27622.4826	12137.89970	11
	Military	60878.9760	41500.92026	10
	Total	41090.6151	26827.48940	62
Survivors	Employees	35475.6411	20375.92187	19
	Craftsmen	29460.7536	12818.12185	15
	Agricultural workers	12212.0656	8924.11062	4
	Military	33437.5503	15487.25936	17
	Total	31513.3655	17086.19952	55
Overall Total	Employees	41157.6412	24785.40657	63
	Craftsmen	33122.9247	15984.61536	51
	Agricultural workers	21851.2047	12382.05851	20
	Military	42087.5331	25836.10475	43
	Total	36886.9411	22533.71782	177

Source: Authors

The findings, as presented in Table 1, reveal statistically significant variances in the mean values across the three analyzed pension categories (invalidity, old-age, and survivor pensions). The subsequent table provides a summary of the average pension disbursements across both the beneficiary classifications and the types of pensions.

In the disability pension segment, employees are accorded the highest median pension payouts. In contrast, within the old-age pension segment, military personnel are granted the most substantial average pension disbursements. Similarly, in the family pension segment, employees again secure the highest median payouts. Conversely, agricultural workers invariably obtain the lowest average pension disbursements across all assessed segments, encompassing disability, old-age, and family pensions.

Figure 1. Quantitative Analysis of Assessed Pension Recipient Categories



Source: Authors

CONCLUSION

A minimum of one third of OECD nations maintain foundational minimal pension schemes, contingent upon the socio-economic strategies and fiscal robustness of their budgetary frameworks. The evolution of financial and investment architectures within pension systems, since the inception of the inaugural model in Germany, has been propelled by demographic shifts in gender and age distributions, globalization, and the accelerated advancement of technology (Rašević and Galjak, 2022).

The economic downturn of 2008 and the COVID-19 crisis of 2020 underscored the susceptibilities within the global financial infrastructure and the hazards posed to the fiscal stability of pension systems (Dorofeev et al., 2023). The pension policy in the Republic of Serbia, primarily aimed at rectifying the disparity between the burgeoning number of pensioners and the dwindling workforce, underscores the imperative for reform within the pension system. Our scrutiny of the Pension and Disability Insurance Fund's outlays—the principal fiscal expenditures—affords a detailed perspective on the financial burdens of pension distributions, essential for evaluating the sustainability of these systems.

The introductory portion of this analysis emphasizes that the enduring financial stability of the pension framework must be predicated upon a meticulous examination of fiscal outflows. Given the diverse economic and sociopolitical landscapes, Serbian pension policy strives to demonstrate a commitment to regulatory and statutory oversight concerning pension-related fiscal flows, thus bolstering a sustainable pension structure. The Europe 2020 Strategy champions measures such as diminishing public debt, augmenting employment, and comprehensive reforms of social security mechanisms. According to Mercer and the CFA Institute (2018), an exemplary retirement framework integrates defined governmental objectives for each pension segment, establishes a baseline for retirement funding, ensures efficient management of pre- and post-retirement pension schemes, maintains transparency in administrative and investment expenses, allows flexibility in contributions or asset accumulation during retirement years, promotes sustainable motivations for voluntary contributions, and ensures that corporate pension fund management is autonomous from governmental oversight.

In the medium term, improvements in the financial underpinnings and sustainability of Serbia's pension system may arise from heightened employment levels or a diminution in the informal sector. Yet, enduring challenges such as demographic aging and the prolongation of retirement ages signal the looming instability of state pension schemes reliant on perpetual funding.

Our municipal-level inquiry reveals statistically significant discrepancies in average pension distributions among various recipient, with the highest pensions disbursed to military personnel and employees, followed by moderately lower payments to artisans, and the minimal amounts to

agricultural workers. Furthermore, considerable variations are apparent across pension, with old-age pensions being the highest, succeeded by disability and survivor benefits.

This analysis not only probes the composition of pension expenditures at the city level but also sets the stage for further investigation into cost containment and the enhancement of pension system policy analysis, including potential modifications to the social security architecture. Additionally, the insights gleaned help illuminate the factors to be considered when assessing retirement determinants, aimed at rectifying disparities within the pension framework. The call for extended national-level research to further guide policy formulations is also accentuated.

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Original Article

FROM MARGINS TO POWER? THE AGROECOLOGICAL INTENSIFICATION PATHWAY AS A FIGHT FOR NEW RIGHTS

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Abstract: *Agroecology has become the goal and the guideline for sustainable agricultural production and food systems. Governments and (natural) scientists tend to frame agroecology mainly as a technological challenge. The paper presents agroecology as a social intensification pathway. While behavioral aspects of farmers' decisions have been largely investigated, the role social relationships and power relations play in the agroecological intensification pathway has received less attention. The paper argues that the agroecological intensification pathway is a means for its (marginalized) supporters to increase their socio-political capital and their control over their livelihoods and the food system. For this purpose, I examine the agroecology intensification pathway from a political ecology angle, at three levels, each embedded in the next : the farm level, the territorial level, and the global level. Actors engaging in agroecology derive social and political benefits from it: These are self-determination at the household, the territory or of the global food system level, redefining the farmer-nature relationship, and the use of agroecology as a discourse in resource conflicts. In essence, these benefits depend on the ability of farmers to organize their territories into agroecology-enabling spaces. The building and protection of such spaces requires agroecological actors to fight for their rights to existence. Social movements and farmer groups do precisely this by creating an enabling institutional environment and challenging the dominant morale and neo-classical values. The agroecological intensification pathway, if based on a grammar of egalitarian relations to nature and others in the food system, requires and has a potential for fundamental transformational changes. Thus, the agroecology intensification pathway appears inherently political.*

Key words: *room for maneuver, social capital, agroecology, rights, power relations*

JEL classification: *Q1 : agricultural economics*

1. INTRODUCTION

Agroecology has become the goal and the guideline for sustainable agricultural production and food systems and how to make the transition happen is a burning issue. Governments and (natural) scientists tend to frame agroecology mainly as a technological challenge which can be addressed with economic incentives. Yet, agronomists and ecologists convinced of the benefits of agroecological cultivation methods noticed that economic arguments are not sufficient to convince farmers to adopt agroecological practices (pers. communications). So what, except from economic incentives, can drive farmers to farm agroecologically?

The underlying rationale is that economic incentives are sufficient for farmers to change their farming system. Indeed, for small changes such as the substitution between pesticide and pheromones for plant protection, the expectation and realization of an increase in marginal gains may be a sufficient incentive. However, the adoption of an innovation or the incorporation of a new practice into a system requires investments in labor, knowledge and personal motivation from the farmer. Engaging in the agroecological pathway requires farmers to process a shift in their worldview: from reductionist to holistic, which is far from trivial (e.g. Mann et al., 2019). They need to think of their farms as whole system, in which parts are connected, rather than in terms of separated activities (that can be certified independently) and to reconsider their objectives. Conceptually, but also physically, this implies the reorganization and intensification of the economic as well as the non-economic parts of the farming system. Among the many non-economic factors which may play a role in the practice of agroecology among farmers, the social ones are the focus of this contribution. It is true that research has looked at farmers' practices from a behavioral

perspective. Yet, Burton (2004) points out, behavioral studies decompose behavior in its cognitive components including attitude. Yet, what is the importance of knowing the attitude of someone to an innovation scheme when we don't know the meaning this scheme has to this someone? In an attempt to understand the language of farming better and to conceptualize what the real meaning (wording by Burton, 2004) of agroecology for farmers is, we take a closer look at the socio-political capital and power factors. It is currently vividly debated in the arena of agroecology actors whether the concept of agroecology inherently contains the political dimension that many social movements and NGOs attribute to it (Giraldo and Rosset, 2016). This is relevant especially in the (West) European context, where political struggles in agriculture are often perceived as specific to developing regions, especially South America. Is agroecology not only a way of farming? It is, indeed a way of farming. And farming is not only reduced to agronomy. Farming is an identity (Burton, 2004) and this identity varies with the different types of farmers. Farming is also a network of relationships which construct this identity. It is a an activity based on the interaction and relationships with nature, with peers, with communities where he activity is taking place, with the landscape and territory and with the other actors of the food the system (firms, "consumers").

In this context, agroecology can be conceptualized as a form of land-use intensification, or using a wording from van der Ploeg (2012), as an intensification pathway. Agroecological intensification combines several dimensions described by Erb et al. (2013) in their analysis of land-use intensity: an increase in the inputs used in terms of knowledge and often also labor, the maintenance of, if not the increase in, yields, and most importantly, the strengthening of system properties, such as biodiversity, the complexity of ecosystems, soil health, among others. Agroecology practices are of course based on ecological principles (Nicholls et al., 2017); yet agroecology is more than environment-friendly practices or even regenerative agriculture. Following De Schutter (2017), a central characteristic of the agroecological intensification pathway is that agroecological farmers farm *with* nature rather than attempt to dominate it. In addition, the implementation of agroecological farming systems is rooted in its local territory. It is based on the use of inputs, genetic material, technologies and knowledge which are local or locally adapted, locally developed. Farms and the activity of farming are embedded in an agrarian structure, a territory, including the inputs and output systems the farmers interact with.

Van der Ploeg (2012) proposes that farmers can (sustainably) intensify if: 1) farmers get some benefits out of the intensification, benefits that justify the additional effort and risk put into the system; and if 2) farmers have "room for maneuver", that is, means and opportunities to change their production process. The paper adopts a political ecology and a system's perspective to look at how actors as social and political agents benefit from and contribute to the existence of agroecology on a given territory, in a self-strengthening cycle. We will attempt to answer two operational questions: 1) How do agroecology farmers, individuals, groups and movements benefit from agroecology? 2) How does the agroecology practice and its expansion benefit from agroecological social groups and movements?

I postulate that agroecology is rendered attractive and possible by inherently social, and especially political, enabling dynamics. More precisely, I argue first that until today, the spread of agroecology has been related to the gain of social capital by those who follow an agroecology intensification pathway. These actors originally acted at the margins and still have little power in the current global food system. Second, the practice of agroecology in the long term depends on the activity of social movements with a political agenda of structural change. Indeed, I argue that social movements and the political agendas they have are necessary to ensure a space in which smallholders can practice agroecology at the individual and territorial levels by creating appropriate institutions and awareness (Patel, 2009). This multidimensional space is presented here as a composite of alternative knowledge systems, markets and inputs. The article then illustrates how social organizations work towards establishing a protecting institutions and acting on current societal values.

In today's context, where agroecology is quickly becoming a paradigm for the redesign of fields into food systems (Holt-Giménez and Altieri, 2013; De Schutter, 2011, Gliessman, 2016), Val et al. (2019) propose the term of "agroecological peasantry" to refer to primary production within the agroecological food system. The use of the term does trigger the question whether an agroecological agro-industry is possible. We argue rather that the egalitarian socio-political character of agroecology practices, especially the relationship with nature, make the choice of sovereignty and autonomy possible and thereby inherently lead to a quest for a renegotiation of

power relations in the food systems. We conclude that the agroecological intensification pathway enables marginalized actors to regain control on the food system and their livelihoods.

2. THE RIGHT TO HAVE RIGHTS

Text. Agroecology as an intensification pathway is based on a social intensification process. A social intensification pathway, according to van der Ploeg (2012) takes place by improving the quality of inputs and of the system properties (seeds, soil fertility), through investing more non-financial resources: knowledge, skills, time, and by improving the system's technical efficiency. In contrast, van der Ploeg defines technological intensification as the redesign of the farm around new technological models and the use of corresponding fixed packages of inputs. An example is the Green Revolution and the industrial agricultural intensification process. Within a social intensification pathway, the change of agricultural practices and the redesign of farms under agroecological principles would require, according to van der Ploeg (2012) both that farmers have and perceive "room for maneuver" in order to adjust or transform their practices and farming system, and that farmers benefit from the adoption of this pathway.

2.1 ROOM FOR MANEUVER AND ENABLING AGROECOLOGICAL TERRITORIES

Farming landscapes are the response of their time to the economy of their time and the results of a negotiation between landowners, farmers, input firms, knowledge hubs and states, each holding their own interests (Widgren, 2012). Thus, current farming systems would be a logical land-use response to the current external and internal conditions of the landscape. If an agroecological transition is to be fostered, farmers need to have means and opportunities to redesign their farming and production system within this current global context.

Room for manoeuver, for van der Ploeg (2009), is the existence of a space of „possibilit[ies] for farmers to develop their own strategies to reach their goals". From a political ecology perspective, one can conceive this space as multidimensional: a space where agroecological activities are made possible. I understand the concept of niche of Vanloqqueren and Baret (2018) as a synomym, that is, a space where other (decolonized) economic, social and human-nature relations (Muraca, 2019) rather than current general capitalist exchanges are possible. From a practical perspective, this means that the territory in which agroecological farmers are embedded must become an enabling environment for the agroecological transition.

Wezel et al. (2016) refer to this enabling character in their definition of agroecological territories as: "places engaging in a transition process toward sustainable agricultural and food systems". Fernandes (2008) suggests a typology of overlapping concepts of territory: Territories can be conceived as spaces of governance, as a mosaic of properties, as a marketing sphere and, in particular, as immaterial territories. It is useful to consider these overlapping dimensions of territory concomitantly to imagine the characteristics of an enabling space. One of the factors enabling a transition towards agroecology at the territorial level is the existence of, or possibility to create agroecological markets embedded in the territories (Wezel et al., 2016). Another one is the possibility to create networks of local agronomic and technical knowledge (Nicholls and Altieri 2018). A final one is access to land and to appropriate inputs; such as local varieties of seeds.

Wezel et al. (2016) define territories as "landscapes resulting from the interaction of a socio-technical network of actors with the ecological, agricultural objects of this landscape". For Fernandes (2008) the result of this interaction is rooted in a historical intention as territories are "a space of relationship created by actors and their intentions" (own translation). This spatial organization is the reflection of development models (Fernandes 2008). The idea of intention is reflected in the definition of immaterial territory as paradigms, theories and ideologies at the basis of the maintenance of the territory (ibid). Immaterial territories are associated with all forms of material territories. Importantly, they are collectively created. So the fight for the collective immaterial territory is an integral part of the fight for physical and market territory. It is indeed through the acknowledgement of the immaterial territory, here the paradigm for food systems, by a concerned public and the institutions in power that one may win a fight for access to land, for instance.

2.2. ENABLING CONDITIONS AND POWER RELATIONSHIPS

At the societal scale, Patel (2009) argues that the agroecological transition relies on a change in the institutions governing the current agrarian and food systems towards rules and arrangements which favor the development of agroecological markets and the establishment of agroecological actors and practices in territories. Patel (2009) also brings forward the point that such changes in the institutions depend on general change in the morale governing the global food regime (see McMichael, 2009). We understand the morale as

the commonly accepted set of values upon which actions in the society are justified and accepted. Currently, according to Patel (2009) the rights to a healthy environment of other species and of future generations, to autonomy and to self-determination are not prioritized and therefore they are not protected. One could claim for instance the right to healthy foods or the right of small farmers to continue existing within capitalist exchanges, or the right for peasantry to maintain itself using alternative exchange forms. Yet, rights exist only if they are recognized and protected. If not, *de facto* they do not really exist (Patel, 2009). Rights do not exist *per se*. First, institutions need to be designed to protect given rights. Secondly, Public opinion has to recognize and value these rights. Thus, the morale or ethical code will define which rights shall exist in a given society and food system. As a result, Patel (2009) points to the necessary struggle of agroecologists for the right to have rights.

While we morally, increasingly accept the need to protect our environment, there is no moral consensus on the need to modify the societal hierarchy in the current economic and food system. Yet, scaling-up agroecology would require a power shift. Indeed, agroecology gives power to actors - peasants, local consumers, indigenous peoples- who until now have had little power and are operating at the margins at the global level. In addition, due to the fact that it relies on more direct relationships between input providers, technology providers, knowledge providers, food providers and eaters at a regional level, agroecology points towards a more egalitarian system, different from hierarchies inherent to the capitalist system. Egalitarian values are not prioritized in the current food system (Patel, 2009).

2.3. BENEFITS FROM AGROECOLOGY

Let's now turn to the second condition for agroecological intensification. Farmers have to perceive some sort of benefit from the change in their allocation of resources. This improvement must justify the additional resources invested in the agricultural system. However, they need not necessarily be financial. Farmers willing to embrace agroecology need to build up a network to shape their environment, but also to have the capacity to shape their environment, that is, to gain social capital. Our main assumption is that social capital plays a fundamental role at the three levels of the AET described above: individual, territorial and global. Transitioning towards agroecology can be viewed as entering a club of thought sharing a specific worldview and values, be it simply a group of people identifying to this worldview or in the form of associations or social movements. Simply making a stance for agroecology as a means of producing is a step which shows opposition (resistance) to global, industrial and conventional agriculture. We borrow the definition of social capital elaborated by Bourdieu as described and analyzed by Siisiainen (2000) as having two dimensions. First, social capital is a resource that is connected with group membership and social networks. Belonging to a group and establishing relationships can be utilized to improve the social position of the actors in associations, political parties, etc…. Second, social capital is related to the fact that membership is "based on mutual cognition and recognition" (Siisiainen, 2000). This is how social positioning "acquires a symbolic character, and is transformed into symbolic capital (Bourdieu, 1986 cited in Siisiainen, 2000)." These two aspects will be highlighted in the next sections.

It thus seems that agroecology develops through its club identity via networks. It is within this network that agroecology farmers develop technologies, knowledge, practices and seeds which can support them and their farming system and increase their autonomy with regard to the current corporate food system (after McMichael, 2009). Belonging to the group sharing this paradigm also provides social capital in which it gives political leverage to members and supports them in questioning current power relationships. Further, the agroecology paradigm for the use of the land and for the organization of food systems (e.g. Holt-Gimenez and Altieri, 2013) is in itself an "immaterial territory" which, together with the production system and the food system, can be used in resource access struggles.

3. HOW AGROECOLOGY BENEFITS THE FARMERS WHO ADOPT IT

This section describes how adopting and taking position for agroecological practices can benefit agroecology actors in terms of empowerment in general and in particular of social capital.

3.1. AGROECOLOGY AS A PRACTICAL CONTEXT TO RE-NEGOTIATE THE RELATIONSHIP WITH NATURE

According to De Schutter (2017), agroecology stems from a renewed understanding and relationship to Nature". I perceive two ways in which the farmer's relationship to nature changes under the practice of agroecological farming: in its vision of the farm as an ecological system and as a result in his/her power relation to the ecosystem.

Agroecological practices can be seen as tailored to support the production basis so that practitioners co-produce with nature. They consist in a series of techniques such as composting, the use of cover

crops of mulching, living fences, agroforestry, etc… which operationalize main agro-ecological principles (Nicholls et al. 2017). The enhancement of biological interactions and synergies, of soil, field and landscape biodiversity and of fundamental ecological functions stem from a system thinking perspective. This perspective opposes linear thinking where land is seen as a substrate on which inputs are added to supplement it so that the crop of choice can be cultivated. Linear thinking leads to searching for fixes to enhance your output while solutions in system thinking aim to improve the functioning of the overall system. In an agroecological setting, the farm is an ecosystem that needs to be managed first. It is through this change in focus that agroecology is able to regenerate degraded lands. Thus it empowers users of agroecological measures to turn marginal land resources into productive resources which can support livelihoods.

In addition, the focus on the farm as an ecosystem seems to provide a particular relationship to land. Gaarde (2017) reports on the peasant, and today largely agroecological, movement La Via Campesina: from the very beginning in Mons, Belgium, in 1993, the movement adopted the identity of "the people of the land" (Desmarais, 2008 in Gaarde, 2017). This statement of La Via Campesina runs counter the current extractive, exploitative and colonial (Plumewood, 2003) relationship to nature characterizing the industrial agriculture and food system. This exploitative perspective is based on a "Western" worldview, conceiving Man separately from Nature. This dichotomist perspective is brought into question by the statement "the people of the land".

One possible interpretation of this statement is the concept of land stewardship or of environmental stewardship in general. Stewardship refers to the "sound and ethical use and management of natural resources on behalf of an agent, often the greater society, future generations or God" (Worrel and Appleby, 2000). It recognizes the value of nature for itself but portrays humans as keepers of nature (ibid). I have encountered this attitude for instance among ranchers in Namibia (Domptail, 2011), where farmers express the need to care of the "*feld*" (rangeland), while those who fail are put under much pressure by peer farmers and even their family. Müller (2019) reports that farmers in Hessen express great attachment to land, as a life center for their family since 5 generations in some cases. Yet, the caring worldview they share still depicts the farmers as users of the land. This land is subordinate to their action and has no agency, nor logic of functioning. Thus, steward farmers decide, in the context of the knowledge system they are embedded in and of the ruling ethical code, what a sound and ethical use of the land consists in (Worrel and Appleby, 2000; Bennett et al., 2018). Burton (2004) shows that farmers associate a symbolic value to the "productionist" exploitative way of farming, which contributes to their identity as farmers. This symbolic is a central point at least in Western Europe blocking the interest for alternative farming practices.

On the other hand, "People of the land" may also refer to a bond transcending the dichotomy between man and nature and in which people and nature are not separated. This worldview is shared by several indigenous groups worldwide. For instance, older inhabitants of the Western Kavango, who live from farming, gathering and fishing, claimed themselves to *be* the river, and the land in which they inhabit (Mutota, unpublished data, 2016). In Australia, Rose (1996; cited in Langton, 2003) explains that "aboriginal management links people to their environment, rather than giving them dominion over it". In the farmers' movement La Via Campesina, the need to bond with nature, to care for mother earth and spirituality was also brought into the debate by indigenous people (Rosset and Martinez-Torres, 2013). Quinn (1992) attempted to document this worldview in his book Ishmael in which he calls for a more humble vision of men in the ecosystem and to more egalitarian relationships, here first and foremost with nature. Importantly, in this worldview, nature plays an active role in the production of food: van der Ploeg (2012) stresses that peasants and nature "coproduce". In agroecology, how nature functions is taken into account, understood and amplified by humans in order to produce food (Nicholls and Altieri, 2018). Agents other than humans are recognized in the farming system. Famous examples include permaculture systems. Punctual ones are efforts by agroecological farmers to maintain the integrity of their animals. For instance, farmers keep horned cows (as opposed to the wide-spread dehorning practice). In Germany, a network of about 100 farms, keeps calves with their mothers. This shows an attempt to decolonize the farmers' relationships with nature (Escobar, 2008). The worldview in which relations to nature are decolonized provides the context for farmers to develop their practices and agroecological way of farming.

Thus, when farmers redesign their relationship with nature, they also question their own role and position towards nature and their power hierarchy towards nature. And because agroecology practitioners act in nested systems - a farm, in a territory, in the global economy -, nurturing this new relationship with nature may require that power relations with the other spheres of the food

system are also re-negotiated. In addition, worldviews guide actions in all domains of life, and not only in one. The relationship one builds with nature mirrors therefore the other relationships one depends on. This would suggest that through the adoption of a more egalitarian relation with nature, agroecology practitioners will logically strive to apply egalitarian relationships in their other social and economic relations.

3.2. AGROECOLOGY AS A PRACTICAL MEANS TOWARDS SELF-DETERMINATION IN THE CONTEXT OF THE CORPORATE FOOD SYSTEM

Operating an agroecological farming system frees farmers from several relationships with the current corporate food system and strengthens their autonomy and their capacity to self-determine their farming system.

In the corporate food system, inputs, technologies and knowledge are mostly accessible through cash, and not in kind. This can be a heavy financial burden for many small farmers, in developing countries. In addition, farmers paid higher prices in absolute terms for inputs in 2012 than in 1990 (Fuglie et al., 2012), while prices for many agricultural commodities have gone down. Agroecological farming systems have proven financially more accessible than conventional agricultural systems in contexts where cash and inputs are limited. A famous example at the national scale is the agroecological conversion of Cuban agriculture, following the break-down of the soviet block and as a response to the penury of inputs and technologies (Fernandez et al., 2018). At the scale of individual farmers, the implementation of an agroecological farming system has built an escape route from a vicious circle of debt following the necessary purchase of inputs in the conventional system (Rosset and Martinez-Torres, 2013; pers. comm. farmers Brazil 2017, Uganda, 2019).

In addition, the implementation of an agroecological farming system creates autonomy for farmers from large corporate firms and their (one-size-fits-all) innovations. The corporations are very powerful in the current food regime. The concentration in several global agricultural input industries has risen significantly. By 2009, the largest four firms in the crop- seed, agricultural chemical, animal health, animal genetics/breeding, and farm machinery sectors accounted for more than 50 percent of global market sales in each sector (Fuglie et al., 2012). In addition, the largest agricultural input firms are responsible for a large and growing share of global agricultural research and development. In doing so, they strongly influence the technologies being developed and implemented on the ground. Agroecological practices enable farmers to emancipate themselves from large input firms and to a certain extent from the current food regime. Indeed, they are based on the regeneration of the ecosystem, on local seed exchange, on the use of locally developed knowledge (Nicholls et al., 2018). Recently in Hessen, Germany, seed producer farmers, farmer unions and universities have collaborated to produce and make accessible local organic cereal seeds which are resilient to climate change.

This is also the case for technologies. For instance, the Atelier Paysan, a non-profit cooperative started in 2009 in southern France with an association of organic farmers set up in the face of the recent global appropriation of farm technology. Through the cooperative, farmers reclaim farming and technology skills to lower their dependence on external firms and ready-made solutions. In the cooperative, innovations are specifically designed for organic production methods. Knowledge development and sharing is prioritized and no patents are issued on the produced technologies.

Farmers also seek to increase their autonomy from global markets and international market regulations through agroecological markets. For instance, in Germany, farmers taking part in a Community Supported Agriculture scheme justify their choice of organization by the desire to give value to non-standardized products (e.g. too- curvy cucumbers) and reduce wastes and losses (Schilling et al., 2023) on the one hand. On the other, they try to escape (global) market pressure and the grow or perish dilemma "*We kept on thinking: do we really want this, always more, always faster*"(Frankfurter Farmer cited in Schilling et al., 2023).

Through this autonomy from exchanges in cash with corporations in the formal economy, farmers also have the opportunity to reorganize their relationships among themselves and redefine their role within the informal economy. For instance the youth group of La Via Campesina sees the opportunity to change the relations towards their peers through the adoption of the agroecology pathway (Fenton et al, 2017). In Germany, members of the agroecological Alliance for Young Farmers (*Bündnis für Junge Landwirte*) point to the importance of maintaining farmers in the countryside for the ecological and social life the countryside itself. We also found that a CSA farmer in Frankfurt values and invests much time in building a knowledge and work link between his consumer members and the farming activity and the land (Schilling, 2019).

Thus, implementing agroecology at the farm and group level is a way to act against the power

distribution in the current corporate food regime (McMichael, 2009) and also to put farmers' aspirations and needs at the heart of their farming system, "rather than the demands of markets and corporations" (Nyéléni, 2007).

3.3. AGROECOLOGY AS AN IMMATERIAL TERRITORY ASSOCIATED WITH AND USED IN RESOURCE CONFLICTS

Beyond the practical and organizational aspects of agroecology, an important domain is the use of agroecology as a paradigm for the use of the land. The corresponding agroecology discourse is centered around the activity and maintenance of smallholders, who have a close relationship to the land, and produce the majority of the food consumed on earth with an agriculture that nurtures soils and ecosystems and supports rural life, landscapes and traditions (Rosset and Martinez-Torres, 2013). In contrast, agroecological actors portray industrial agricultural methods as exploitative, energy consuming, mass producing and destructive. This paradigm competes with the currently dominating one, the productionist paradigm, based on a discourse of efficiency in which the necessity to produce massively is the central argument for industrial agriculture (Lang and Barling, 2012). Agroecological actors use and build agroecology as a form of resistance towards the current power structures, the productionist paradigm and the creation of new alternative food systems (Oehen et al., 2015). More precisely, Rosset and Martinez-Torres (2013 and 2012) demonstrate that the agroecology paradigm and the associated discourse and logic which justify the practices and actions of the agroecological actors can be seen as an immaterial territory (definition of Fernandes, 2008). The agroecology immaterial territory is used to take up position against the dominating system, often the corporate food regime.

The immaterial territory associated with agroecological intensification pathway, the agroecology paradigm, is an important weapon in disputes over the physical territory of land itself. All around the world, agroecological farmers feel marginalized in their access to land and use agroecology to maintain or gain access to land. Agroecology as an immaterial territory enables smallholders to differentiate themselves from other land use actors and in this way to put a claim on land (Rosset and Martinez-Torres, 2013). The agroecological paradigm as immaterial territory is thus an essential part of the fight for land in a given territory (Martinez-Torres and Rosset, 2012). The farmers' movement La Via Campesina is struggling to maintain smallholders in the productive landscape to perpetuate their lifestyle and ensure their livelihood. They reject the neo-liberal model of rural development and agricultural policy development from which they are excluded (Gaarde, 2017) as these policies marginalize smallholders and favor corporate actors in the access to land. This phenomenon is not only relevant in South America. In the Eastern Cape Province, Republic of South Africa, agroecology was used by groups of colored farmers to claim land and resist against commercial agriculture and land grabbing through buildings (Tamlit, 2014). In Brandenburg, Germany, young agroecological farmers created an Alliance (*the Bündnis für Junge Landwrite*) in order to change the auction rules in large scale land sales of former state farms, as they could not compete with investors invading the land market (Domptail et al., 2018; Brunner, 2019).

The agroecological immaterial territory is also used to take position against another dominant system: patriarchy. Patriarchy also determines land access in the customary rights in numerous countries. That explains that women's organizations have adopted agroecology to claim more power and land at the household level (Patel, 2009). In Brazil, female farmers have built a network of innovators in agroecology which has taken them out of isolation to positions of leadership (Galvao Freire, 2018). In Mals, South Tyrol, Italy, rural women have expressed their support to agroecology in a poster campaign in order to fight for pesticide-free air and playgrounds for their children. Sometimes, they have done so against the opinion of their husbands in a context where this is highly unusual. The women reported that the seemingly simple step of taking a stance had strongly empowered some women of the community (Schiebel, 2017).

3.4. DEFENDING AGROECOLOGY AS AN IMMATERIAL TERRITORY

Agroecology as an immaterial territory has enabled weaker actors to increase their control over key resources in their livelihoods, and therefore change existing power relations in the territories where they operate. The reduction of agroecology to a suite of simple basic agricultural practices such as mulching or no-tillage, applicable in multiple farming contexts, will reduce the power of these actors to transform power relations and food production in the food system. Thus, a considerable battle is being fought around this immaterial territory. In the public and policy sphere, NGOs lobby for an understanding of agroecology as a transformative approach, which "must be clearly differentiated from climate-smart agriculture", the later relying on the same inputs as conventional agriculture and therefore only perpetuating the current main agricultural model

(*Positionspapier*, 2019). Scientific communications such as the report of Oehen and colleagues from the organic agriculture research institute in Germany and Switzerland (2015) or Giraldo and Rosset's paper (2016) also point to the risks of co-optation of the agroecology paradigm by concepts of e.g. climate smart agriculture.

4. CREATING ROOM FOR MANEUVER

4.1. A MULTI-DIMENSIONAL SPACE IN WHICH AGROECOLOGY IS OPERATIONALIZED

According to McMichael (2009), the current food regime is determined by corporations, supported by states, think tanks and universities and organized so as to benefit these actors. The corporations include large input firms (seeds, fertilizers, phytosanitary products), retailers and food processors. They dictate standards for products, prices, and especially, farming techniques (the Green Revolution). Indeed, the food regime is associated with a technological regime which controls and drives the direction of innovation further in one direction, characterized by high-tech innovations, rather than agroecological techniques (Vanloqueren and Baret, 2018). According to Vanloqueren and Baret (2018), this is because bio-engineering and agroecological techniques rely on a different technological paradigm, where the agroecological ones aim to make improvements in a system where relationships work better and the whole system is advanced rather than maximize one aspect. As a result, science and technologies in agroecology have been supported far less than bio-technologies: the first stagnated while the latter flourished. Corporations or investors also increasingly control land (e.g. Rosset, 2011), a major input.

This context provides very little room for maneuver for farmers to change practices and perpetuate an agroecological intensification pathway. Vanloqueren and Baret (2018) envision the creation of local niches in which agroecology can develop, rather than trying to upscale agroecological practices at once. This concept of niche resonates on the one hand with that of room for maneuver suggested by van der Ploeg (2009) giving farmers the possibility to act differently, and on the other with the agroecological territories described by Wezel et al. (2016) as *enabling* environment for agroecology. I see the room for maneuver as a multi-dimensional space, nested in a geographical territory, in which knowledge, inputs and power relations favoring and enabling agroecology are produced and reproduced.

Evidence shows that the creation of this enabling space is a result of collective action. In Cuba, the existing large social capital played a key role in enabling the agroecological transition of the country (Fernandez et al., 2018). Farmers and proponents supporting the agroecological intensification pathway need to organize into networks such as farmer groups, alliances or associations in order to be able to construct exchanges which do not follow the corporate market logic, as we shall see.

First**, a**groecology is a knowledge-intense pathway. Agroecological knowledge incorporates traditional farming practices, novel scientific knowledge and is often developed in a cooperative process involving farmers in a group or farmers together with scientists. Hubs for local agroecological knowledge where transdisciplinary research prevails and peer-transmission through farmer-to-farmer exchanges are crucial for technically successful agroecological farming (Nicholls and Altieri, 2018, among many others). While in the beginning of the 1980's agroecological farmers were rather isolated, several agroecological knowledge and practice hubs have developed now, mostly around alternative agricultural institutions. In Germany, groups of practitioners have developed around the faculty for organic farming in Witzenhausen or around the school for organic farming of Eberswalde which build agroecological clusters at the territorial level. These groups play an important role in knowledge dissemination and sharing among the farmer members and between the education institution and the farmers (unpubl. data, Müller, 2017). The cooperations have succeeded in applying system thinking at the heart of their innovations, which are tailored to the needs of the local farmers, as the innovation of the seed population varieties developed in Dottenfelder farm in Germany shows (Spieß and Vollenweider, 2017). Such agroecology clusters around universities with an agroecological program exist also in India and in Uganda (Isgren and Ness, 2017) for instance. These knowledge hubs are not only agronomic but also technical. Since technologies for organic or agroecological agriculture are hardly accessible, some cooperatives of farmers have strived to develop appropriate technologies fitting their specific needs, as we can see in the example of L'atelier paysan, in France.

Farmers also organize the access to appropriate inputs in their territory. These efforts include seed exchange fairs (e.g. own observation Cangucu, Brazil, 2018) and semi-legal local and organic seed multiplication associations (e.g. Kokopelli in France, https://kokopelli-semences.fr/fr/). These seeds are reproducible and free of patents. Farmers also create groups and alliances in order to access

land. Access to land is increasingly problematic for farmers given the growing importance of land as an investment good, bringing small farmers and peasants to compete with investors for land on an increasingly capitalist land market (Brunner, 2019). The actions farmers undertake are diverse. For instance, semi-legal land occupation campaigns are the main tool of the *Movimiento de los Trabajores Sin Terra*, MST, in South America (Rosset, 2011). In Germany, the alliance for young farmers (*Bündnis für Junge Landwirte*) plays an important role in helping its members gain access to land. The coordinator of the alliance has come to act as a land broker between young farmers with an agroecological project and land owners interested in giving their land, rather than renting it at a hefty profit, to projects enacting values of solidarity, rural life, environmentalism and animal welfare (unpublished data, Müller, 2017). These exchanges create a parallel land market.

Farmers also create ties among themselves or with consumers in order to market their produce without following the rules (prices, quality standards) of the global market. This is necessary because the agroecology intensification pathway uses higher inputs in labor and it requires people's work to pay off. In the current food regime, it is known that most of the value associated with agricultural products is concentrated at the higher levels of the value chain, in most cases by processing and mostly distributing firms. This pattern follows the one of the concentration of power along value chains (Menard and Valscheschini, 2005). That is why Loconto et al. (2014) underline that "agroecology market networks are embedded in communities, so that benefits reach producers, consumers and intermediaries alike. In some cases, this was the result of an active "re-embedding" of market exchanges into living communities". These initiatives function differently than formal market dynamics as they redefine an "efficient exchange" as one that can address the needs of certain groups of the community and address ecological, social and economic goals concomitantly (ibid). for instance, rural-urban exchanges around a town in Ecuador were strengthened by an initiative of food baskets delivered by farmers to a group of urban dwellers at a price beneficial to both parties Heinisch 2018): the set price for the exchange was higher than the farm-gate prices farmers were receiving through other markets and was lower than city dwellers were paying at their local supermarket. Community Supported Agriculture (CSA) schemes all around the world also develop farm-specific networks and organizations which lead to a win-win situation in terms of income security, work satisfaction and healthy food access (e.g. Schilling et al., 2023).

This enabling space is thus characterized by exchanges that escape market logic. As Patel (2009) notes, this space is not only an attempt to shift, at the territorial level, the power from leading actors in the current global food system to farmers who perceive themselves as in a marginal position. Actors of the enabling space are collectively striving to establish more inclusive and egalitarian relationships among actors of the food system. Thereby, such spaces can be the cornerstone for building a theory based on more egalitarian food systems. As Monnin et al. (2019) wrote, the recognition of this reality as valid knowledge "never comes without a fight".

4.2. INSTITUTIONS TO PROTECT AND PERMIT ENABLING SPACES

Currently, there is no societal consensus that smaller and less rent-oriented farms have a right to exist and maintain themselves in the countryside. Economists are still discussing whether it is a good idea to maintain "inefficient" farms. There is also no consensus on the role corporations should play in the global food system. Patel (2009) suggests that the right to exist for marginal small scale agroecological farmers is not explicit. In order to exist, these rights and their enacted forms: the enabling spaces, have to be protected by institutions.

For example, in Finland, institutions of the welfare state have sometimes originated as critical social movements, which presented the political system with demands (Siisiainen, 2000). In the case of agroecology too, researchers, NGOs and farmers' unions lobby in order to influence existing institutions or fill an institutional vacuum. All demands have a common aim : to increase the power of marginalized actors (small or subsistence farmers, but also civil society as "eaters" and inhabitants of the agricultural territories) in the food system.

With regard to agricultural and food policies in Europe, NGOs and researchers demand radical changes both in their focus and in the policy instruments. The focus of all policies, demands for instance the *Positionspapier* (2019) written by a consortium of 40 German NGOs, should be on marginalized actors who currently encounter difficulties entering the farming sector in Europe: youth and agroecological actors. In addition, policies shall support exchange forms and patterns which are undermined by the increasing power of global market dynamics at the territorial level, such as such as local knowledge creation, local and direct markets. The third demanded focus is

support to local collective initiatives, a recognized key element in the construction of an enabling space for agroecology. Indeed, laws and regulations affect the way agriculture is developed and organized, and legal regimes affect contracts that connect parties in the food chain linking producers to consumers (Ménard and Valceschini, 2005). For instance, quality standards play an important role in shaping markets. Yet, these are increasingly set by corporations. Farmers' freedom to organize their farming system and marketing strategies shrinks as a result. For instance, Carrefour, the second largest retailer, developed its own meat quality label (Mazé, 2002, cited in Ménard and Valceschini, 2005): it selected its own participating farmers and operates a very strict quality control at purchase. Of course, ensuring quality in the food system is important. Yet, as Guthman (2004) pointed out about the organic sector in California at the beginning of the millennium, defining quality and the means of regulating it will affect the operationalization of an agroecological territory. Participatory quality guaranty schemes can be seen as an institutional innovation to address this topic from the bottom-up: they consist of a network of stakeholders including buyers who define quality criteria for the whole production process and not only the product but including social, ecological and security aspects, and control the production process themselves. These locally focused quality insurance systems are built on a foundation of trust, social networks and knowledge exchange (IFOAM, 2019).

This change in focus should be enacted by the adoption of other policy instruments or a shift in the allocation of funds for agricultural and food projects. Changes in existing institutions are requested by actors supporting agroecology, especially in the common agricultural policy. Activist researcher groups have published reports on the allocation of subsidies, showing for instance that in Germany a meager 1,2% of the farms snatched up up to 28,4% of the CAP subsidies in 2013 (Kay, 2016). The consortium of agroecology NGOs in Germany demands subsidies to be distributed entirely on the basis of social and environmental services and focused on young and agroecological farmers (*Positionspapier*, 2019). The British government has been put under pressure to increase the funds attributed to agroecology projects by a scientific publication (Pimbert and Möller, 2018) revealing the low current state spending on agroecology (5% of agricultural aid), despite a supportive discourse. The German ministry of development and cooperation was requested by NGOs to fund agroecological projects exclusively (*Positionspapier*, 2019).

Further, new institutions enabling agroecology actors and civil society to have more control on the attribution of state funds to development projects are proposed. In their common position paper, the German NGOs demand that the civil society of countries receiving agricultural research projects be represented in the funding committees. Similarly, the creation of an agroecological council, having a say in the distribution of funds for agricultural projects, was suggested (*Positionspapier*, 2019).

Farmer organizations also have played a crucial role in the amendment of institutions and their regulations to shape an enabling space where farming agroecologically becomes possible or even legal. That is one reason why La Via Campesina trains agroecology farmers to act politically and pressure governments (Rosset and Martinez-Torres, 2013). In Germany, the alliance for young farmers (Bündnis für Junge Landwirte) came together to lobby against the auction-based land sale procedure in states in former Eastern Germany. All land was being sold to the highest bidder. But the Alliance managed to impose a quota of 20% of land to be offered to environmentally-friendly or young farmers. Another example is the great effort in lobbying German and Swiss organic seed breeders have invested to obtain the legal approval of "population varieties" as valid and marketable seed material by their governments (Spieß and Vollenweider, 2017). Population varieties are composite cross populations of seeds, which makes them more adaptable and resilient to climate change, whereas currently approved commercial seeds have uniform genetic material. In 2015, the first German seed legislation (approved by the German Federal Plant Variety Office) to introduce oat, barley, wheat and maize populations on the market was implemented. The current conventional breading tradition focusses on uniformity to guaranty the appearance of a few selected traits in an effort to maximize of yields under perfect circumstances (ensured with artificial water, fertilizers and plant protection). The established breeding system is not meant to support variable seed populations. It is not meant to support farming systems based on the natural territorial characteristics. Seen in this light, the legal move of the German government is a break-through. At the same time, it makes explicit the extent of the challenge in changing the current institutional system into one that wants and can support an agroecological intensification pathway.

4.3. SHAPING THE RULING MORALE

In parallel, general views of what is desirable and legitimate for a society to strive for also conditions the existence of rights for agroecological farmers to develop egalitarian market, nature and social relations. It is apparent that environmental values or at least awareness can be considered common at least in Western societies, especially through their conservation efforts. Yet, the new relationship with nature that agroecology seeks to establish is based on what Martinez-Alier calls a different language of valuation (2009) of nature. Agroecologist practitioners, groups and NGOs attempt to change the terms of reference for environmental actions, as well as for actors' relations in the food system – they demand livelihood sovereignty (Muraca, 2019). Changing this language of valuation, changing the perceived position of humans towards nature, of development towards the environment and towards people is, as Muraca (2016) claims, a political act.

Actions aiming towards a new valuation language are taken among all agroecologist supporters. Farmers, and the civil society are organizing to influence this ruling **morale** (Patel, 2009) and raise awareness for egalitarian values and an alternative possible future.

NGOs attempt to change the reference for action in agricultural intensification strategies. To stick with the German example, the 40 NGOs demand in their position paper (2019) that all cooperation projects are based on agroecology and that all agricultural education incorporates agroecological principles and knowledge These two aspects are related because the people trained in agricultural education institutions including universities are the ones who will soon work in cooperation projects in the developing world and in the chambers of agriculture in their countries. Today for instance, the GIZ (German Society for Cooperation) invests efforts and funds in training African farmer-trainers with best farming practices based on the Green Revolution methods, knowledge and inputs. These farmer-trainers will then have the duty to form 140 000 other farmers in Ethiopia based on a worldview that is counter to agroecology. The ruling morale in these very powerful institutions is a detriment to change.

Examples of actions carried out by farmers abound. Here are only a few. A major milestone was reached when La Via Campesina was invited to and decided to take part in the UN committee on food security in 2011. On this occasion, they were able to demand radical reform in the land policy (https://www.farmlandgrab.org/post/view/18944-la-via-campesina-opposes-land-grabbing-at-the-un-committee-on-food-security). More importantly, they highlight throughout the declaration that the current priorities on development should be questioned and that other ones, more ethical, such as "feeding the people" and the "well-being of humanity" should replace them. At the smaller scale, and with examples from Germany, several agroecological farmers' groups attempt to communicate their values to the public. Near Frankfurt, *Die Kooperative* (the cooperative) organizes tours on agroecological farms for the public. Near Berlin, the Alliance for young farmers communicates via its coordinator with local authorities, land owners, market outlets. It also has a website in which the different projects it supports are documented and activist actions are organized. On an individual basis some farms go completely transparent about their work. Finally, the Farm Proud Cow (*Hof Stolze Kuh*) communicates via newsletters and its website with the public. It claims to farm "differently" and stimulates the reader to think of what values are important (https://stolzekuh.wordpress.com/).

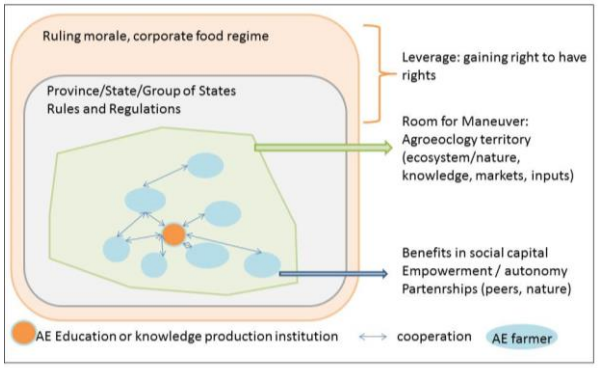
CONCLUSIONS

The adoption of agroecology or engaging in the agroecological intensification pathway for farmers is more than a technical choice where economic advantages can make the difference in an adoption decision. More than that, it is a choice to seek the political and social benefits associated with engaging in agroecology at the individual scale and with the ability of agroecological actors to create maneuvering room at the territorial scale.

Agroecology as an intensification pathway where farmers and nature co-produce food is largely a redefinition of relationships within the food system. Benefits farmers can gain from intensifying within agroecology notably include social capital and empowerment. Because agroecology is based on alternative relations, it requires a space in which exchanges based on other than profit-related values are enacted. The protection of this space is in essence a protection of the rights of agroecology farmers to exist and increase their control of their livelihoods and of the food system. This protection requires further political actions at multiple levels, both institutional and ethical, for which agroecology actors organize at a growing pace. Thus, as stated by Anderson et al. (2019), the practical aspects of agroecology are ultimately combined with the political ones. Agroecology supposes an egalitarian structure (Patel, 2009). Upscaling agroecology would mean that exchanges in the food system are based on values which are not solely profit; that seeds are regulated and land is attributed differently; that fundamental trade and agricultural policies are amended. It would mean

profound change in the patriarchal and capitalist systems. If adopting the agroecological pathways is part of a struggle farmers and supporters must conduct for their very existence in the countryside, this struggle only seems possible through a nurtured agroecology peasant identity. Val et al. (2019) introduce in science the notion used by LVC of "agroecological peasantry". In this construct, the word peasantry can represent the more egalitarian nature of the interwoven relationships characterizing agroecology, as much as the peasant actors themselves. The agroecological intensification pathway, if based on a grammar of more egalitarian relations to nature and others in the food system, requires and has a potential for fundamental transformational changes. Thus, the agroecology intensification pathway seems inherently political.

GRAPHICAL ABSTRACT:



Graphical Abstract: Redefining power relations through and for the agroecological intensification strategy

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Original Article

THE INFLUENCE OF WOMEN'S ECONOMIC ACTIVITY ON CHILDBIRTH, EXAPMLE CITY OF BIJELJINA

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Abstract: *The economic activity of women has led to numerous changes in reproductive behavior patterns. Women who are economically active, or employed, often choose to delay or limit the number of children in order to maintain the financial stability of the family. The costs of raising children represent a significant burden for families, so many couples opt for a smaller number of children to better cope with economic challenges. The decline in birth in our region is closely related to the increased participation of women in the labor market, while in the developed parts of Europe, a higher level of birth among economically active women has been achieved through institutionalized support for parenthood. As today's women are both mothers and workers, there is less time available for balancing work and family obligations. Bijeljina, like the Republic of Srpska, is a low-fertility area that lacks over 30% of live births to achieve the magic number of 2.1 children for natural population renewal. This paper focuses exclusively on childbirth according to the type of economic activity of women in the process of forming the ideal size of the family in the area of the City of Bijeljina.*

Key words: *low birth, economic activity and employment of women, work-family balance*

JEL classification: J13

1. INTRODUCTION

Over the past 150 years, population fertility has undergone a complete transformation from the era of the first industrial revolution to the present day in line with the level of economic development. Demographic transition represents demographic changes of all populations on their path to transformation into modern industrial societies (Arsenović et al., 2018). Demographic transition involves the transition from high rates of reproduction (fertility, mortality, natural increase) typical of traditional underdeveloped societies to low rates of the same components in modern contemporary societies conditioned by economic, social, and cultural development. In many countries undergoing economic transition, a decrease in the fertility rate is observed. This may be the result of changes in socio-economic conditions, such as increased economic uncertainty, greater participation of women in the labor market, postponement of marriage and family formation, as well as changes in life priorities and values. As Micevska (2001) states, at the beginning of the demographic transition in the observed period from 1989-1998, there was a sudden decline in the total fertility rate and the general birth rate in most Balkan countries except Croatia (TFR from 1.63 to 1.45 children per woman) and Bosnia and Herzegovina (TFR from 1.9 to 1.8 children per woman), which only recorded mild changes in the mentioned rates. Before demographic transition, there was almost no country in the EU that had less than two children per woman, but by the end of the 20th century, all European countries except Albania had a total fertility rate below 2. Scientific literature offers broader explanations for the causes of declining fertility rates. In addition to biological factors, socio-economic determinants that dictate the present cost of parenthood play a significant role.

Higher levels of education have changed the position of women in society; they are no longer just mothers but also full-time workers whose employment and busyness affect the lack of free time for child care. In recent decades, there has been increasing participation of women and mothers in the labor market, and if women are much more involved in child care than men, this "double shift" for many employed mothers may represent pressure due to the incompatibility between roles undertaken in the labor market and in the family (Arpino, Luppi, 2020). Consequently, there is a negative correlation between the total fertility rate and the employment of women, who now constitute 40% of the global workforce (Behraman, Gonalanos-Pons, 2020). Concerns about occupation and income, as well as the lack of housing space, have led to a series of

changes not only in the size of the family but also in its survival. The high cost of preschool institutions, impractical working hours for parents, and the political and economic situation are just some of the factors determining aspects of family life. As society modernizes through economic and social changes such as industrialization, urbanization, and education levels, it first leads to a decline in mortality, and then to a decrease in fertility. Rising living costs and declining economic value of children are considered the main motives that have reduced reproduction and demotivated the desire for childbirth (Bongaarts, Watkins, 1996). Studies on the economic crisis and uncertainty that hit Europe and the USA explain the same effect on financial roots, fertility, and consequences for the real economy. Economic shocks dramatically affect family dynamics, with 22 out of 32 Western countries recording a decline in the fertility rate between 2008 and 2013.

The worsening labor market during the Great Recession largely accounts for the negative consequences for fertility rates. A sudden increase in the unemployment rate characterizing the recession has reduced the total fertility rate in the West by 3% from the beginning of the crisis (Comolli, 2017, Matysiak et al., 2021). According to the findings of Andrei et al. (2015), social changes, political situations, economic growth, and decline have reflected in the demographic picture of the country affecting both natural and mechanical movements of the population. Finally, it has been proven that employment uncertainty and financial uncertainty affect the postponement of family formation (Caltabiano et al., 2017, Zeman et al., 2018).

2. METODOLOGY

The primary data sources used in this study are the published results of the censuses from 1991 and 2013. The methodology involved collecting data on vital statistics, analysis, synthesis, comparison, and tabular and graphical representation. Access to this data was sought from the Republic Statistical Office of Republika Srpska because certain data are not published for cities, municipalities, and regions, but only at the Republic level of observation. Statistical data relate to the administrative area of the City of Bijeljina, based on which the natural population movement was analyzed, specifically the analysis of birth rate for the period from 1998 to 2020. The Statistical Office of Republika Srpska has pre-war data from vital statistics (1992-1995); the only earlier available data are the total population figures from previous census years. Data from demographic bulletins (10-20) of the Republic Statistical Office of Republika Srpska were used, as well as data obtained from the archive of the office, relating to the economic activity of the population by gender, and births by maternal age, based on which the following indices were calculated.

Labor force utilization rate:

$$\alpha_{(15\text{-}64)} = \frac{P_{a\ (15\text{-}64)}}{P_{(15\text{-}64)}} \times 100$$

Overall activity rate:

$$p_{a==} \frac{P_a}{P} \times 100$$

Unemployment rate:

$$u = \frac{U_{15-64}}{A_{15-64}} * 100$$

Employment rate

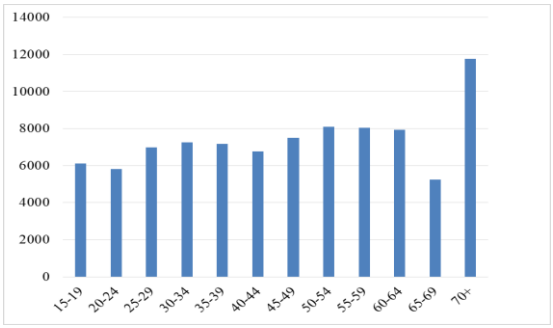
$$e = \frac{E_{15-64}}{P_{15-64}} * 100$$

2. ECONOMIC STRUCTURE OF THE POPULATION

In terminological sense, the economic structure of the population consists of economic indicators of activity, income, engagement in certain activities, occupations, and other factors. The working-age population consists of individuals aged 15-64 years, which is further divided into economically active and inactive.

According to the estimates of the Republic of Srpska Statistical Office in 2020, in the city of Bijeljina, 88,664 working-age population were registered, accounting for 85.43% of the total population. Of these, 52.25% are women and 47.74% are men. In terms of age structure, the highest participation is observed in the age cohorts of 45-49, 50-54, 55-59, and 60-64 years, which constitute the older mature population. There is also a noticeable increase in the participation of the older population aged 70 years and above. The economically active population comprises age categories of all employed and unemployed individuals, while the inactive population includes dependents, retirees, students, the incapacitated, and individuals engaged in household chores.

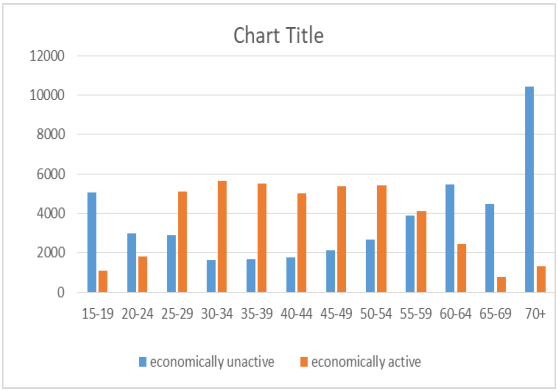
Graph 1. Working-age population of Bijeljina in 2020.



Source: Statistical Office of the Republic of Srpska, author's calculations

The economically active population consists of 44,600 individuals, accounting for 42.97% of the total population, while inactive individuals constitute 42.45% (44,064). In terms of age structure, the most numerous economically inactive population is aged 70 years and above, followed by the age group of 60-64 years (5,474), and then the younger population aged 15-19 (5,043). The economically active population mainly consists of mature individuals aged 25-54 years (Graph 2).

Graph 2. Economic structure of the population of Bijeljina in 2020.



Source: Statistical Office of the Republic of Srpska, author's calculations

Fertility, mortality, migrations, age-gender structure, level of education, labor force, and numerous socio-economic factors directly determine the size of the economically active population. The economically active population constitutes 50.30% of the total 88,664 working-age population, based on which the rates of economic activity were calculated (Table 1).

The overall activity rate is around 42.97%, while the labor force utilization rate is 61.72%. The consequence of this dynamic can be seen in the unfavorable age structure or high proportion of agricultural population, which is characteristic of the fertile region of Semberija.

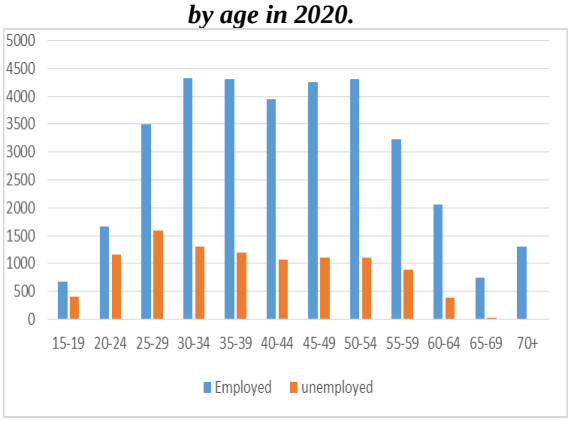
Table 1. Economic structure of the active population

Economicall active P_a	Total population P	Labor force active Pa 15-64	Overall activity rate $p_a=\frac{P_a}{P} \times 100$	Labor force utilization rate $\alpha_{(15-64)}=\frac{P_a}{P_{(15-64)}} \times 100$
44600	103783	42501	42,97%	61,72 %

Source: Statistical Office of the Republic of Srpska, author's calculations

The active population can best be understood through the structure of employed and unemployed individuals.

Graph 3. Employed and unemployed population by age in 2020.



Source: Statistical Office of the Republic of Srpska, author's calculations

The largest share of the employed population consists of age cohorts from 34 to 54 years old. As age increases, the number of individuals in employment decreases. Out of the total number of employed individuals (34,349), 60.74% are men, and 39.26% are women. The employment rate stands at around 24.11%, representing 38.74% of the total working-age population, which is below the national average (34.90%). The unemployment rate is around 49.88%, reflecting the increased proportion of older individuals in the total population.

Table 2. Rates of employment and unemployment of the population for the year 2020.

Unemployed	Employed	Labor force 15-64	Unemployment rate	Employment rate
10251	34349	68850	24,11 %	49,88%

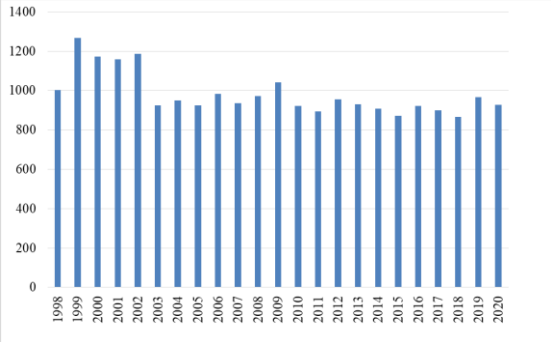
Source: Statistical Office of the Republic of Srpska, author's calculations

Unemployment, as a hallmark of an uncertain future and economic crisis, indirectly affects the delayed formation of marriages and the decision to have children. Local government authorities should consider the low employment rates and incorporate strategies to increase employment as a developmental goal for the city and region in the future.

3. ECONOMIC ACTIVITY OF CHILDBIRTH

During the observed period of 1998-2020 in Semberia, a total of 22,571 children were born, averaging 981 annually. The highest number of live births was recorded in 1999 with 1,266, while the lowest (865) was observed in recent years, specifically in 2018, with a percentage decrease of 31.67%.

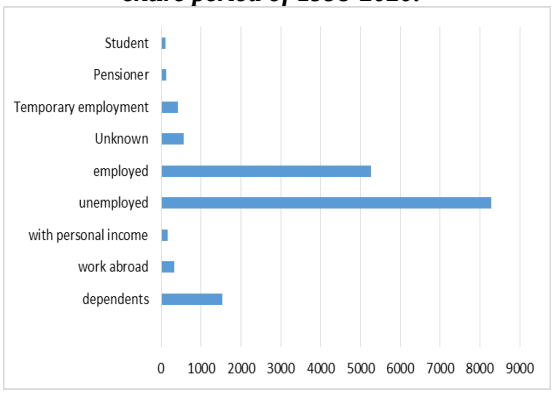
Graph 4. Live births from 1998 to 2020.



Source: Statistical Office of the Republic of Srpska, author's calculations

Although childbirth is a positive component of population dynamics, the trend of its decline is now an integral part of the demographic picture not only in this area but also in the Republic of Srpska. The causes of this trend should be sought in the psychological and socio-demographic structure of the post-war population, which, besides the process of displacement, has faced a significant decline in the economy, unemployment, and unstable political situation. Post-war traumas have left a mark on the demographic future of this area through later marriages, a decreasing desired number of children, and an increasing aspiration for economic and professional stability, further burdening the already low birth rates.

Graph 5. Economic activity of mothers for the entire period of 1998-2020.

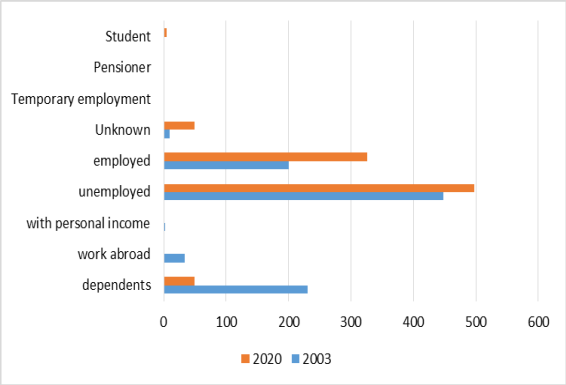


Source: Statistical Office of the Republic of Srpska, author's calculations

The highest share of live births for the period from 2003 to 2020 is among mothers who are classified as unemployed individuals, accounting for 49%. This can be attributed to the opportunities for independent childcare. Additionally, the number of live births among employed mothers accounts for 31.32%, while 9.1% are among supported individuals with no income. The remaining 10.58% includes mothers who are students, pension beneficiaries, in temporary employment, working abroad, with personal income, or with an unknown employment status (see graph 5).

Graph 6 presents a comparative analysis and changes in the number of live births among mothers with different economic activities at the beginning and end of the observed period. In 2003, the highest number was among unemployed mothers, accounting for 48.48%, followed by supported individuals at 25%, and employed mothers at 21.64%. The presence of births was not recorded among mothers who were students, pensioners, or in temporary employment. However, by the end of the observation period in 2020, there was a slight increase in the number of student mothers by only 0.43%, while mothers who were pension beneficiaries or working abroad were not recorded. Temporary employment was reported for only one individual, as well as personal income. The remaining births were distributed among unemployed mothers at 53.61%, employed mothers at 35.16%, and 5.2% with an unknown status.

Graph 6. Economic activity of mothers in 2003 and 2020.



Source: Statistical Office of the Republic of Srpska, author's calculations

What can be inferred from the parameters mentioned is that unemployed mothers mostly give birth due to having free time but without income, while employed mothers need access to cheaper preschool facilities that meet the demands of parenting and the parents' income level. Encouraging childbirth among student mothers during the most fertile period of life, between the ages of 20 and 24, should be considered along with providing free childcare and tuition during their studies.

CONCLUSION

With modernization and industrialization, there has been a change in the role of women in society. Women are no longer just mothers and housewives but also workers, which has led to changes in reproductive behavior and less time for family and its development. We are faced with the fact that the economic cost of parenthood is increasing in line with the modern societal value system, which, in conditions of depopulation, can be very unfavorable for the survival of future generations. Considering the overall situation, it can be concluded that the existing state of the economy, level of education, and personal attitudes of individuals have led to a decrease in childbirth and parental decisions to have fewer children (one or two) due to the inability to provide them with optimal living conditions. The economic component remains crucial for the survival of the family and the realization of basic life needs, thus acting as a limiting factor for increasing childbirth and expanding the family. In Central and Eastern European countries, the fertility rate largely depends on significant changes in the economy and specific socio-economic conditions. The persistently low fertility rate has led to increased public and political interest in trying to find ways to maintain or increase the fertility rate. To encourage the childbirth process in economically well-developed areas, family policies should focus on supporting families in the upbringing and education of children, employing women, and supporting their return to work after maternity leave with flexible working hours and work-family balance.

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Review Article

BRICS – NEW ECONOMIC REALITY

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Abstract: *The current architecture of the international economic system is undergoing significant changes in favor of countries whose economies have not been dominant at the global level. This particularly applies to the BRICS (Brazil, Russia, India, China) which possesses significant political and economic potential. Considering the increasing interest of a growing number of countries in joining this bloc, it can be concluded that BRICS represents a new economic reality that cannot be ignored. The aim of this study is to highlight the importance and role of BRICS countries in the international financial system. The subject of the paper includes the analysis of monetary and fiscal indicators of BRICS countries for the period 2006-2023. The obtained results show long-term favorable trends in monetary and fiscal indicators, indicating that BRICS countries can be identified as economies with significant potential for growth and development.*

Key Words: *BRICS, economic potential, monetary and fiscal indicators*

JEL classification: *E01, E31, E60, H63*

1. INTRODUCTION

In conditions of permanently intensive geopolitical events and unstable economic circumstances, there is a growing need for countries to better position themselves and adapt to the emerging circumstances. Regional integrations have become a leading global trend as an attractive and efficient way for countries to participate in global processes. The formation of regional blocs was initially seen as a process parallel to globalization, but increasingly globalization and regionalization are viewed as complementary processes. Today, countries like BRICS (Brazil, Russia, India, China, and South Africa) are actively participating in the process of regionalization at the global level (Lagutina, 2019). The current architecture of the international economic system is rapidly changing in favor of countries whose economies were not dominant at the global economic level. This particularly applies to BRICS countries and Asian economies, which are increasingly asserting themselves on the world stage. Zharikov (2021) emphasizes that BRICS has a good perspective for reforming the global economic system and aiding the world economy. BRICS can be seen as a potentially competitive economic bloc that will enable the utilization of each country's individual advantages in the context of global approach and presence in the international market. In this way, opportunities are created for a synergistic effect that can have effective implications on the economic currents of BRICS countries. Molefe and Mah (2020) define this bloc as a partnership known for having the fastest-growing economies with significant implications for local and global business flows. Accordingly, Goueva and Gutierrez (2023) highlight that BRICS countries are seeking ways to deepen their economic and political complementarity and interdependence through technology and innovation sharing, as well as preferential trade and investment arrangements. The new global architecture leads to new trade and

investment alliances, where this economic bloc could promote a more inclusive and equitable growth model in regions like Africa and Latin America (Lal, 2023). Additionally, the future of BRICS countries may be directed towards infrastructure projects such as the Chinese "Belt and Road Initiative," where infrastructure development can generate significant employment and create a middle class that will stimulate long-term economic development (Shahrokhi et al., 2017).

2. DEVELOPMENT OF BRICS

BRICS was first defined by Jim O'Neill in his report (O'Neill, 2001) and represents an acronym for a group of countries (Brazil, Russia, India, China, and South Africa). It can be seen as a form of economic as well as political alliance among these nations. Specifically, BRICS can be defined as a regional organization of an informal nature aimed at developing and strengthening economic and political cooperation among the mentioned countries. BRICS is often viewed as a forum because the work and functioning of this bloc are characterized by the aspirations of these countries for increasing and intensifying cooperation and the willingness to create new political and economic perspectives at the international level.

At the 2006 summit, Brazil, Russia, India, and China met for the first time on the sidelines of the United Nations General Assembly. The first formal meeting of these four countries was held in Yekaterinburg, Russia, in 2009, which gave this grouping institutional significance. The summit defined fundamental principles regarding the reform of financial and economic architecture, such as: a democratic and transparent process of decision-making and implementation in international financial organizations, a solid legal foundation, compatibility of activities between national regulatory institutions and international standards bodies, as well as strengthening the practice of risk management and supervision. Additionally, there is a highlighted need for improving and reforming international financial institutions. Developing countries must have greater representation in international financial organizations in terms of voting and decision-making. Simultaneously, there is an emphasized need for a stable, predictable, and more diversified international monetary system based on intensified use of national currencies in bilateral and multilateral trade relations. (https://infobrics.org/news/summits/)

In addition, Iqbal and de Araújo (2015) specify that the BRICS countries have identified three areas of cooperation: a) cooperation in achieving energy efficiency and developing clean energy sources, as well as joint action and sharing of new technological knowledge and operations; b) cooperation regarding population and employment issues with constraints arising from the increasing population growth (especially in China and India); c) cooperation in the direction of urbanization and transportation development as two major constraints influencing the growth and development of the BRICS economies. However, Jiaduo et al. (2023) state that the environmental dynamics of the BRICS countries, characterized by significant population density, are shaped by extensive use of natural resources and rapid urbanization. This profiles these countries as currently the largest polluters worldwide (Khan et al., 2020). Therefore, Huang (2024) emphasizes that BRICS countries should prioritize sustainable trade practices by integrating environmental issues into trade agreements and policies. This primarily involves supporting environmentally friendly supply chains and reducing trade barriers for environmentally sustainable products. The second summit was held in Brazil in 2010, where issues of international cooperation, the global financial crisis, the selection mechanism of World Bank and IMF leadership, G20 affairs, United Nations reform, climate change, and regional or international cooperation of BRICS were discussed. The then BRIC evolved into BRICS in 2011 when South Africa joined and became the fifth member at China's initiative, completing the group's regional coverage. At the fifth summit in Durban in 2013, the establishment of the New Development Bank and the agreement on forming a pool of currency reserves were discussed.

At the VI summit in Fortaleza, representatives of the BRICS countries signed an agreement to establish the New Development Bank with its headquarters in Shanghai and an initial capital of $50 billion. The New Development Bank was founded based on the concept of existing regional development banks, where besides financing projects of general importance, it also provides technical assistance for project implementation regardless of the funding source (Stojković, 2016). The idea behind establishing the New Development Bank is to enable a higher degree of financial independence for countries, providing an alternative to the World Bank and IMF in terms of financing. Additionally, another agreement to form a pool of currency reserves totaling $100 billion aims to protect the national currencies of BRICS representatives from potential disturbances in financial markets. It's important to highlight the significance of the VII summit of the BRICS countries, jointly held with the Shanghai Cooperation Organization and the Eurasian Economic Union in Russia in 2015. Alongside the

BRICS countries, representatives from countries such as Afghanistan, Armenia, Belarus, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, and Uzbekistan participated. At the VIII summit in India in 2016, the importance of combating international terrorism was emphasized through adapting the comprehensive convention on international terrorism at the UN General Assembly. Regional and international cooperation, improvement of industries of BRICS representatives, were discussed at the IX summit in China in 2017, as well as the X summit in South Africa in 2018. Interestingly, the debate on digital currency began at the XI summit in Brazil in 2019 as part of discussions on science, advanced technology, and innovations. The following summit was held on November 17, 2020, in the form of a video conference due to the then ongoing global COVID-19 pandemic, where the agenda was defined towards issues of advancing living standards and quality, peace, economy, culture, and society. The XIII BRICS summit was held in September 2021 in the form of a video conference, hosted by India. One of the most significant BRICS summits was held in June 2022, with Beijing as the official host. Similar to the previous summit, the XIV summit was conducted in the form of a video conference, highlighting the importance of the new reserve currency basket supported by precious metals. (https://infobrics.org/news/summits/)

The aim is to enable the combination of BRICS currencies in their bilateral and multilateral trade relations. The XV BRICS summit was held in Johannesburg and is considered a historic event because the question of expanding this group and redefining the group's name to BRICS Plus was opened. Namely, countries such as Argentina, Egypt, Iran, Saudi Arabia, and the UAE were invited to join the BRICS bloc. In early 2024, Egypt, Ethiopia, Saudi Arabia, the UAE, and Iran became part of the BRICS grouping, while Argentina withdrew its membership. It is important to note that in 2023 alone, 17 countries applied or are waiting to join negotiations for membership in the BRICS bloc. These include economies such as Algeria, Bangladesh, Mexico, Sudan, Syria, Senegal, Kazakhstan, Venezuela, Indonesia, Nigeria, Thailand, and Turkey. (https://brics2023.gov.za/evolution-of-brics/).

Considering that the economy of China is larger than the economies of Brazil, Russia, India, and South Africa combined, questions arise about the structural disparity within this bloc and its functioning (Pant, 2013). Additionally, different political motives and economic aspirations are often cited as potential problems in the functioning of this association. Although the economies of BRICS can be seen as heterogeneous, their structures can converge for several reasons. Namely, the economies of Brazil and Russia are mainly based on vast reserves of minerals and resources, while China and India are market competitive in terms of cheap labor and resources at low prices (Radulescu et al., 2014). China could use this bloc as a more secure way to expand its growing economic influence, instead of being viewed as a separate economy due to its unilateral actions. Also, the inclusion of South Africa may result in greater support for China's trade and investment ambitions in Africa. Brazil's membership can be analyzed through the prism of expanding influence on the world stage, given its status as one of the main regional powers in Latin America. Similarly, India lacks political verification at the global level, despite its enormous size, while Russia can use BRICS for other alliances beyond close ties with former Soviet republics (Lowe, 2016). In addition to economic potential, it is important to highlight the political weight of Russia and China as permanent members of the UN Security Council, which is an important condition in positioning this bloc in the geopolitical arena.

The economic expansion of BRICS is further confirmed through the functioning of the New Development Bank. It is important to note that in 2021, the board of directors of the New Development Bank approved the admission of Bangladesh, the UAE, and Uruguay, signaling the beginning of its expansion and profiling as a global multilateral institution. Similarly, the New Development Bank has approved 96 projects totaling $32.8 billion primarily directed towards energy efficiency, environmental protection, transportation, social, and digital infrastructure. Some of the prominent projects include the construction of an LNG terminal in China (Tianjin province) worth €436 million approved to increase natural gas supply capacity and reduce coal usage. Additionally, the project for the rehabilitation of the Indira Gandhi Canal system in the Rajasthan region of India worth $345 million aims to improve water systems and irrigation, promote efficient water use, and increase crop intensity. Another interesting project involves providing a loan to Brazil's third-largest development bank (BDMG) for financing sustainable development investments in the Minas Gerais region (Brazil), focusing on clean energy, urban development for inclusive and smart cities, agriculture, and social infrastructure. Regarding projects in Russia by the New Development Bank, the institution participated in the Russian Federation Government's housing support program, aiming to

address housing issues and improve residential spaces through the increased use of energy-efficient materials. The total project value amounted to $1.4 billion, with the New Development Bank financing $300 million for project implementation. Financing road infrastructure in South Africa totaling $1 billion represents one of the most significant investment ventures realized in the country. The economic potential of BRICS is evident in the fact that this bloc covers 42% of the global population, 30% of the world's territory, 23% of the total gross domestic product, and 18% of global trade. To provide a more detailed depiction of the economic potential of these countries, monetary and fiscal indicators were analyzed for each country individually.

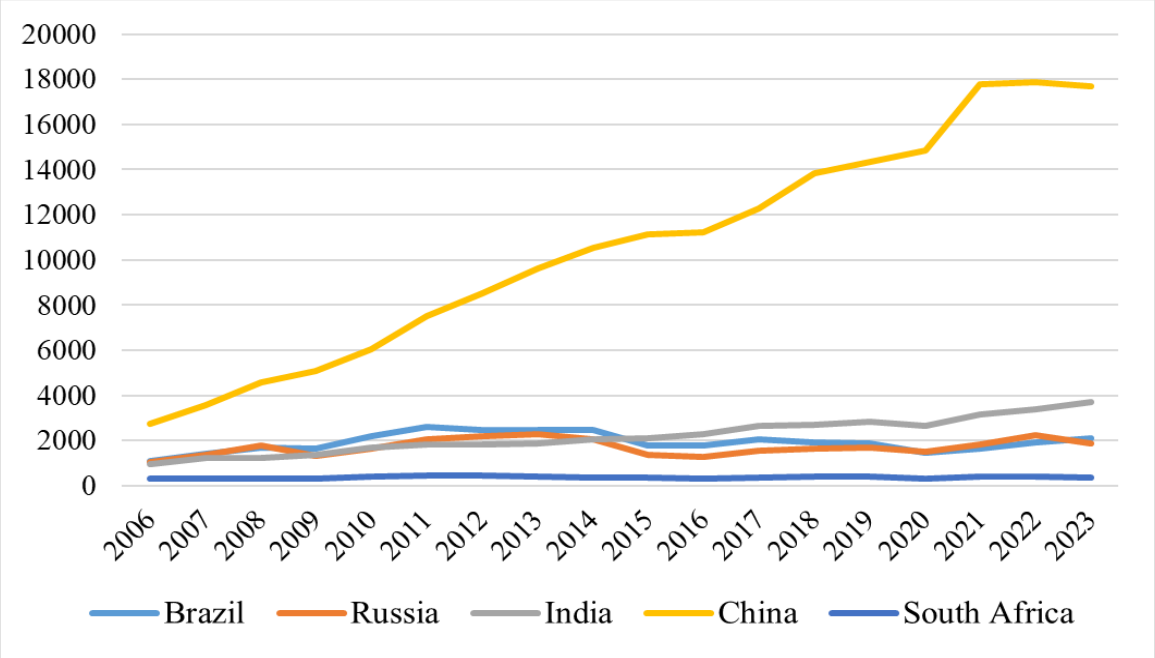
3. MONETARY AND FISCAL POTENTIAL OF BRICS

The monetary potential of BRICS countries refers to their ability and impact regarding monetary policies, currency management, as well as economic and financial aspects.

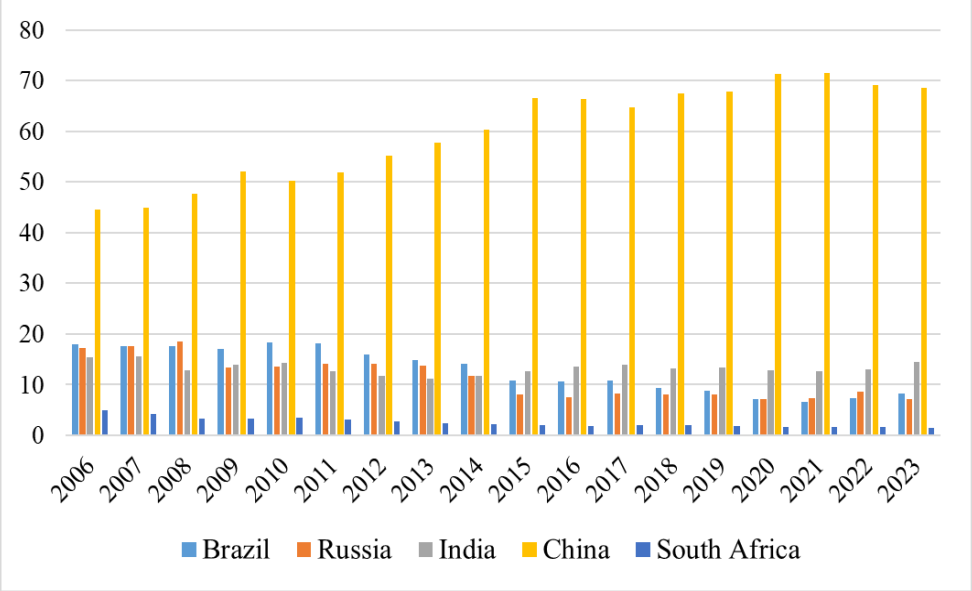
The economic potential of BRICS, measured by Gross Domestic Product (GDP), indicates that from its founding in 2006 until the end of 2023, the GDP increased by 173%. China stands out with a drastic growth of 542%, and India with 132%. Additionally, Brazil's GDP level in 2023 increased by 92%, Russia's by 75.5%, while South Africa's GDP grew by 25.27% compared to 2006.

Each country has its specificities, but collectively they strive to contribute to the stability and dynamics of the global financial system. The fact that BRICS countries, especially China, possess significant foreign currency reserves indicates that these countries play an important role in creating and maintaining stability in the global financial market. However, BRICS efforts are reflected in the diversification of the international monetary system, which involves greater use of their national currencies and less dependence on the US dollar. On the other hand, the fiscal potential of BRICS countries reflects their ability to lead stable, sustainable, and efficient fiscal policies that support long-term economic growth and development.

Graph 1. Gross domestic product in BRICS (in billion $)



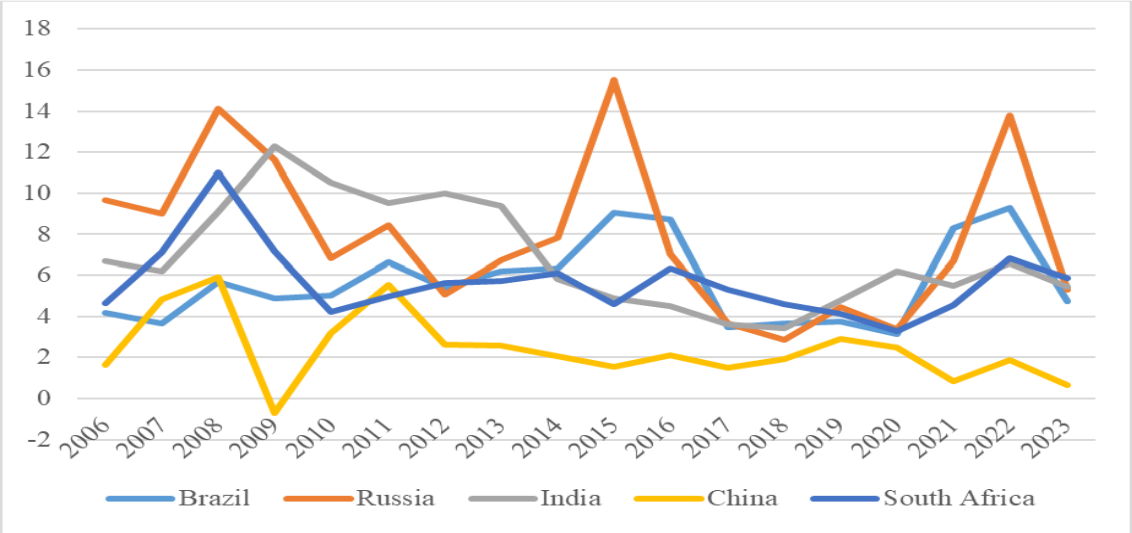
Graph 2. Country share in total GDP of BRICS



In the next graph, you can see how the economic potential of BRICS is predominantly influenced by the economy of China. On average, the share of China's gross domestic product (GDP) amounted to 59.91%, while the other economies comprised slightly more than one-third of the BRICS GDP. The average share of gross domestic product for Brazil, Russia, and India ranged between 11-13%, while South Africa has a significantly lower share in the total GDP achieved.

In addition to economic growth, the inflation rate is one of the most important indicators that indicates the level of price stability in the economic system. In order to achieve positive effects on economic growth and development, it is necessary to enable an inflation rate that will be at a sufficiently high level to stimulate economic activities of producers. On the other hand, the inflation rate must not be too high in order to prevent the economic capacity of the economy and the population from being devalued in terms of reduced investment or purchasing power.

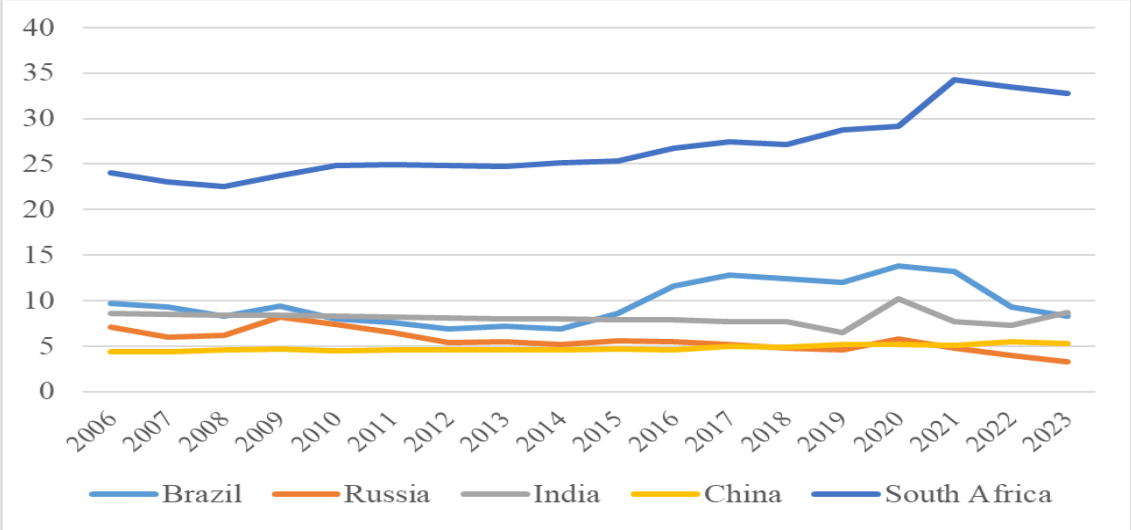
Graph 3. Inflation rate in BRICS



Looking at individual countries, it can be observed that China achieved the lowest inflation rate of 2.37% on average. Brazil and South Africa follow with average inflation rates of 5.6%, while India and Russia recorded average general price increases of 6.92% and 7.9% for the time period from 2006 to 2023. If we analyze the last year, the economy of China was close to deflation, while the other BRICS countries experienced inflation rates between 4-5%.

It is important to note that in 2022, Russia had a double-digit inflation rate of 13.77% as a consequence of the escalation of the conflict in Ukraine. However, the following year, the central bank of Russia managed to reduce the inflation rate to 5.28% through its interest rate policy. The average general price increase in BRICS countries in 2023 was 4.26%, which is approximately the average level of the G7 (4.1%) and higher compared to the EU (2.9%).

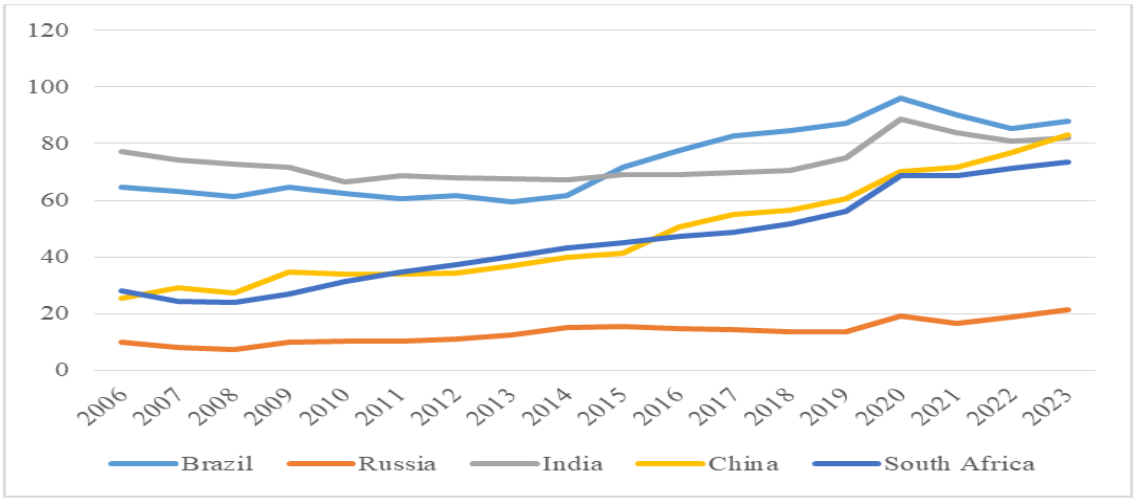
Graph 4. Unemployment rate in BRICS



Unemployment represents one of the key problems facing economies. The average unemployment rate in BRICS countries was 11%, with the highest value recorded in South Africa (as high as 27%), while other countries were around or below 10%. In 2023, Russia and China achieved the lowest unemployment rates of 3% and 5.3%, respectively, while Brazil and India recorded 8% and 9%.

On the other hand, South Africa recorded an unemployment rate of as high as 33%, indicating significant structural problems in the economy of this country. When comparing the unemployment rate in BRICS countries with the averages in the G7 and the EU, it must be noted that it is significantly higher than these groups (4.1% in the G7 and 5.9% in the EU).

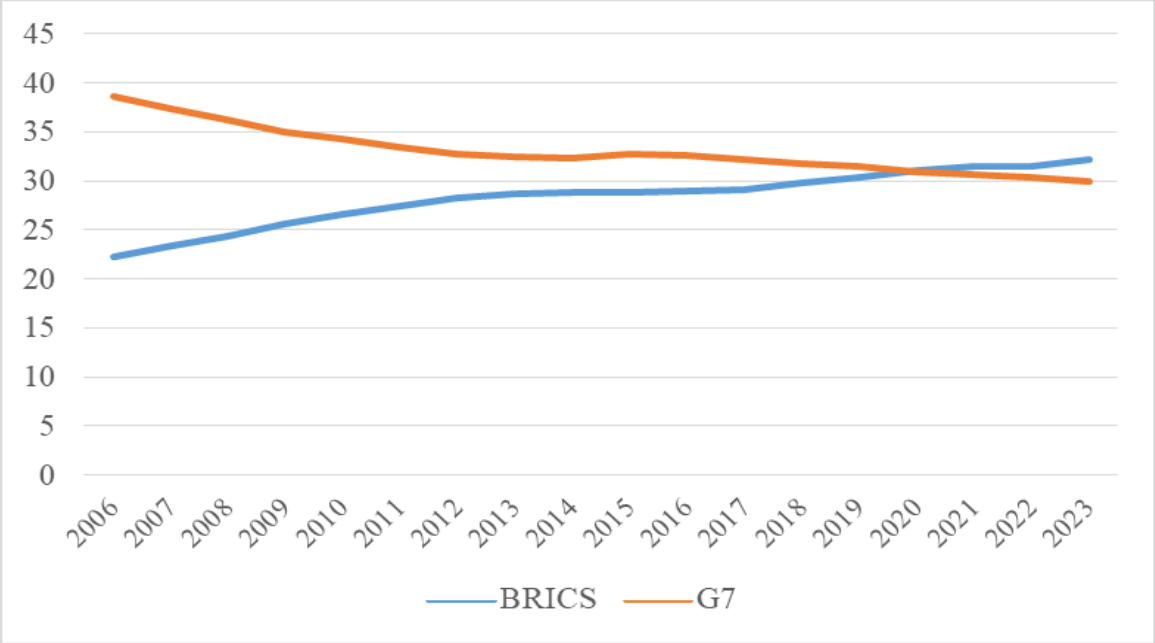
Graph 5. Public debt in BRICS (% of GDP)



Analyzing the share of public debt in GDP, a significant difference can be observed between the economy of Russia and the other BRICS countries considered. Specifically, the average share of public debt in Russia amounts to 13.44% of gross domestic product, which is considerably lower compared to Brazil and India (average share above 73% of GDP). When it comes to China and South Africa, the average share of public debt was at the level of 45-48% of GDP for the period from 2006 to 2023. Based on the above, it can be concluded that the economies of BRICS are burdened with the share of public debt of 50.77% on average.

ignored on a global level. This means that this bloc can be seen as a counterbalance to the current international system, which is predominantly oriented towards global financial organizations such as the World Bank and IMF. Namely, any alternative form of organization that can contribute to economic prosperity represents a desirable phenomenon in international relations. Creating multiple poles at the geopolitical level enables a diversified approach that can foster healthy competition and provide opportunities for countries whose economies are not at the center of the economic world but cannot be considered economic peripheries either.

Graph 6. Comparative view of the share of BRICS and G7 economies in the total GDP - purchasing power



However, if trends in the past five years are followed, the share of public debt has significantly increased as a result of crisis situations such as COVID-19 and the war conflict in Ukraine. Only in the last five years, the average public debt of BRICS countries has increased and amounted to 65.88% of GDP, which is again much lower compared to developed countries and groups such as the G7 and the EU. The economies of the G7 and the EU are much more burdened with public debt, exceeding 123% of GDP for the seven highly developed countries and 90% of GDP for EU member states.

CONCLUSION

Considering the fact that an increasing number of countries see opportunities in this political and economic bloc, it can be stated that BRICS+ represents a new economic reality that cannot be

Based on all the above, BRICS countries are recognized as economies with significant growth potential for several reasons. First, they have a large and growing population, where the observed countries constitute a significant portion of the world population, indicating a large consumer base and workforce for economic growth and development. Second, BRICS includes developing countries, i.e., rapidly growing economies that provide opportunities for investment and expansion. Third, many BRICS countries are rich in natural resources such as oil, gas, minerals, and agricultural products, which undoubtedly can contribute to economic growth. Fourth, BRICS insists on infrastructure projects that can contribute to economic prosperity, with a focus often on investments in transportation networks and energy facilities. Fifth, BRICS countries are increasingly

participating in mutual trade relations, as well as with other regions, creating additional space for economic progress. Also, strengthening their own financial systems and using national currencies allows for further integration of these economies and indirectly reduces dependence on the use of dollars or euros in international transactions

The subject of this paper involves a descriptive overview of the economic potential of BRICS from the perspective of monetary and fiscal indicators for the period 2006-2023. The first aspect encompassed the general economic state by presenting fundamental macroeconomic aggregates such as gross domestic product, inflation, and unemployment. The second aspect related to fiscal potential, which was analyzed through the prism of the share of public debt in gross domestic product. The results of the conducted analysis indicate that BRICS covers 42% of the global population, 30% of the world's territory, 23% of the total gross domestic product, and 18% of global trade. During the observed period of analysis, the GDP of these countries increased on average by 173%, with China standing out as the absolute leader in this economic bloc. Specifically, the size of China's GDP was over 17,000 billion dollars, which is twice as much as all BRICS countries combined. Over the past fifteen years, the average inflation rate of BRICS countries has been 5.7%, with an average unemployment rate of 11%. These trends indicate somewhat stable movement in the general price level, while the double-digit unemployment rate is a consequence of a large number of unemployed in South Africa. When it comes to the share of public debt in gross domestic product, the average share of BRICS countries was 50.77% of GDP for the observed period. Displaying share in global GDP at purchasing power parity, BRICS countries had a greater share compared to G7 countries for the first time in 2020. At that time, the share of these countries amounted to 31.02% compared to the share of G7 economies of 30.94% of total GDP globally. This difference continued to increase in subsequent years, with it being 32.14% compared to 29.92% of global GDP in favor of BRICS countries by the end of 2023. The mentioned economic facts indicate a much more favorable fiscal position of these countries compared to G7 and EU countries, whose economies are significantly burdened by budget deficits and public debts. This implies that these countries have more room for increased consumption, both private and investment, which can lead to positive effects on their economic growth and development. This does not mean that BRICS countries are more developed than G7 economies, which have a much higher gross domestic product per capita and fewer unemployed. The obtained results point to a new economic reality and positive trends in BRICS countries, whose potential will be further strengthened with new members such as Egypt, Ethiopia, Saudi Arabia, UAE, and Iran.

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ANALYSIS OF MANAGEMENT STRATEGIES FOR VIRAL RESPIRATORY INFECTIOUS DISEASES BASED ON ECONOMIC AND SOCIAL BENEFITS

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***Abstract**: **Background** Over the past few years, the COVID-19 epidemic has affected over 700 million people worldwide and resulted in a death toll of more than 6 million. The direct medical costs, as well as the indirect costs in terms of lost lives and productivity, have placed significant economic burdens on patients, the general public, and governments. Despite the conclusion of the pandemic, it is crucial to reflect upon the public health management and strategies employed by various countries during the COVID-19 crisis, identify any shortcomings, and enhance our public health management strategies to effectively tackle potential future epidemics. **Method** This study was based on public health data and related research papers from various countries during the COVID-19 epidemic. It conducted a retrospective evaluation of the main measures and factors for epidemic prevention and control in terms of economic benefits and social benefits. **Result** Restrictive measures had a negative impact on a country's economy and create social problems. The social benefits of vaccination largely depend on its scientific management. The placebo effect can have a positive impact on the economy and society. **Conclusion** Our research showed that mass vaccinations were not a reasonable solution to the epidemic. The placebo effect can produce economic and social benefits during the epidemic, but we need to try to find more economical methods.*

***Key words**: Covid-19, vaccines, placebo effect, management*

JEL classification: I18

1. INTRODUCTION

On March 11, 2020, Milan made an official declaration that the coronavirus (COVID-19) had reached global pandemic status. It wasn't until May 5, 2023, three years later, that the global pandemic caused by COVID-19 finally came to an end (Wise J, 2023). Over the past few years, the COVID-19 epidemic has affected over 700 million people worldwide and resulted in a death toll of more than 6 million (Cheng K, et al, 2023). The direct medical costs, as well as the indirect costs in terms of lost lives and productivity, have placed significant economic burdens on patients, the general public, and governments (Richards F, et al, 2022). Despite the conclusion of the pandemic, it is crucial to reflect upon the public health management and strategies employed by various countries during the COVID-19 crisis, identify any shortcomings, and enhance our public health management strategies to effectively tackle potential future epidemics.

2. SUBJECT

This study aimed to analyze public health management strategies for viral respiratory infectious diseases.

3. METHOD

This study was based on public health data and related research papers from various countries during the COVID-19 epidemic. It conducted a retrospective evaluation of the main measures and factors for epidemic prevention and control in terms of economic benefits and social benefits.

4. ANALYSIS

This study analyzed the management strategies of the COVID-19 epidemic from three aspects: restrictive measures, vaccines, and treatments.

4.1. RESTRICTIVE MEASURES AND HERD IMMUNITY

The global outbreak of COVID-19 has led to a wide array of government actions in response. These actions encompass various measures such as shutting down schools, imposing travel limitations, prohibiting large public gatherings, allocating emergency funds for healthcare infrastructure, introducing new social welfare programs, implementing contact tracing efforts, and other interventions aimed at curtailing the virus's spread, bolstering healthcare systems, and mitigating the economic effects of these measures (Hale T, et al, 2021). Throughout the course of the COVID-19 pandemic, several developed countries like Germany, Sweden, and Switzerland had witnessed various changes in their prevention and control strategies („POLICY RESPONSES TO COVID-19“, 2024). Notably, Sweden had openly suggested pursuing both active and passive herd immunity as a means to manage the spread of the virus („POLICY RESPONSES TO COVID-19“, 2024).

In the field of immunology, the term "herd immunity" refers to the resistance of a population or group to the spread of a contagious disease. This idea was first introduced in a publication called "The spread of bacterial infection: The problem of 'herd immunity'" by Topley and Wilson (Topley WW and Wilson GS, 1923). Herd immunity is only achieved when a significant portion of the population develops immunity to the specific pathogen, which in turn reduces the chances of transmission between infected and susceptible individuals (Smith DR, 2019). In simpler terms, if herd immunity is present, it becomes harder for the contagious disease to spread as the transmission chain is interrupted and susceptible individuals are safeguarded from infection. Herd immunity is derived from individual immunity, which is a process where the body's immune system detects and removes foreign substances, such as viruses and bacteria, to maintain good health. This immunity can be acquired by encountering and recovering from a disease or infection. Additionally, vaccination can also stimulate immunity. Herd immunity is typically achieved through widespread vaccination, like the smallpox vaccine, or when a large number of individuals become infected with a contagious illness, such as influenza (Xia Y, et al, 2020).

If we are to stop the spread of infection in the population through herd immunity, two-thirds of the population needs to be infected or vaccinated (Kwok KO, Lai F, Wei WI, Wong SYS, Tang JWT, 2020). This had led to serious debate about passive herd immunity (Kwok KO, et al, 2020). Active herd immunity through vaccines was generally considered a feasible solution and had been adopted by many countries. But the biggest challenge it faced was viruses that constantly mutate to produce antigenic escape (Suryawanshi YN and Biswas DA, 2023). It was for this reason that some researchers had once believed that classical herd immunity might not be applicable to COVID-19 (David MM, Gregory KF, Anthony SF, 2022). In fact, countries lifting prevention and control measures („POLICY RESPONSES TO COVID-19“, 2024) and being forced to adopt passive herd immunity were the most obvious reasons for the end of the COVID-19 pandemic („WHO COVID-19 dashboard“, 2024).

4.2. VACCINES AND NOCEBO EFFECT

We implemented active herd immunity through vaccines to combat COVID-19. Some COVID-19 vaccines had shown high efficacy against the coronavirus (Feikin DR, et al, 2022), and their effectiveness was enhanced with more vaccinations (McMenamin ME, et al, 2022). However, this effect would significantly decrease with time and virus mutation, which deserved vigilance (Link-Gelles R, et al, 2023, Lau JJ, et al, 2023). Studies had shown that COVID-19 vaccines did more than just prevent infection, but also reduced patients' risk of hospitalization and death (Lin DY, et al, 2022). It suggested that the vaccine was still valuable even if it lost its function of preventing the virus from infecting the human body. This was particularly important for potentially critically ill patients.

Researchers conducted a recent meta-analysis on COVID-19 vaccine trials, specifically focusing on the rates of adverse events. By comparing the adverse events reported by participants who received the vaccine to those who received a placebo injection, the study found that approximately one-third of participants who did not receive the vaccine experienced systemic adverse events such as headache and fatigue (Haas JW, et al, 2022). The "nocebo effect" is observed when an individual undergoes negative symptoms as a result of receiving a treatment that

lacks any pharmacological impact. This study showed that reports of adverse reactions to vaccines had a significant psychological impact on the public, and this will also bring more uncertainty to the effectiveness of active herd immunity. We should not ignore this. Considering the costs, effectiveness, and side effects of active herd immunity, it was worth considering whether COVID-19 vaccines should be widely administered during the coronavirus pandemic.

4.3. TREATMENTS AND PLACEBO EFFECT

Viral respiratory infections are usually self-limiting conditions that can be effectively managed with analgesia and rest (Van Doorn HR and Yu H, 2020, Peters S, et al, 2011). The COVID-19 treatment guidelines from the USA National Institutes of Health (NIH) („COVID-19 Treatment Guidelines“, 2024) clearly stated that the treatment modality for non-hospitalized patients with mild to moderate COVID-19 was symptom management. Antiviral drugs were only used to treat patients who were at high risk of developing severe COVID-19. The treatment for hospitalized adult patients with COVID-19 was sign-supportive care. This suggested that the primary treatment modality for COVID-19 patients was symptom management. The negative psychological effects of the epidemic and lack of understanding of the nature of the disease may prompt people to look for methods that can help them prevent and treat diseases. In fact, throughout most of the pandemic, we had no specific treatment for COVID-19. This mentality of the people will prompt them to seek help from medical institutions, thus placing a great burden on a country's public health system. This will lead to unnecessary financial expenditures and social problems for the country. The use of placebos is an existing and yet to be improved solution to this problem.

The placebo effect refers to the positive effects that come from the overall experience of a clinical encounter, including the treatment process and the relationship between the clinician and patient. This is different from the specific benefits that come from the actual effects of medical interventions. While a placebo (such as a sugar pill) is often used in scientific studies to understand the placebo effect, it is not always necessary to use a placebo in order to see these effects. The placebo effect can also enhance the effectiveness of medical treatments that have been proven to work. Additionally, the communication between practitioners and patients, both through words and actions, can create placebo effects even without the use of specific treatments (Miller FG, Colloca L, Kaptchuk TJ, 2009). Studies showed that placebos were effective in relieving pain and nausea, and that physical placebos were significantly more effective than pill placebos (Miller FG, Colloca L, Kaptchuk TJ, 2009). This suggested that the placebo effect of COVID-19 patients seeking treatment at a medical facility might be more pronounced than if they receive a placebo pill.

5. RESULTS

The following table (Table 1) summarized the evaluation of economic and social benefits of restrictive measures, vaccines, and placebos during the COVID-19 epidemic.

Table 1. The Evaluation of Economic and Social Benefits of Restrictive Measures, Vaccines, and Placebos

	Economic benefits	Social benefits
Restrictive measures	Negative	Negative
Vaccines	Negative	Positive*
Placebos	Positive*	Positive

**** Require specific conditions***

Restrictive measures were once used by many countries as a method to combat COVID-19 during the epidemic. However, this measure proved to be ineffective and was abandoned („POLICY RESPONSES TO COVID-19“, 2024). Countries lifted restrictive measures and ended the epidemic through passive herd immunity. Restrictive measures had a negative impact on a country's economy and create social problems.

Vaccination, as a means of active herd immunity, was used by some countries and had high hopes. Mass vaccinations could produce herd immunity over a period of time, but it faced many challenges, including limitations on effective time, virus mutation, and the nocebo effect. In terms of its contribution to the end of the epidemic, its cost was also too high. We cannot ignore the positive and negative psychological effects of mass vaccination on society. Vaccination, as a means of active herd immunity, can enhance people's confidence in fighting the epidemic. Media informing the public about potential vaccine adverse events may cause or contribute to the nocebo effect (Amanzio M, Cipriani GE, Bartoli M, 2021), and education on the nocebo effect may be helpful (Pan Y, Kinitz T, Stapic M, Nestoriuc Y, 2019, Ballou S, et al, 2022). In fact, the problems faced by social management during the epidemic may become more complicated depending on whether vaccination is available or not. Riots erupt in Austria over lockdown of unvaccinated residents (Ott JS, Edwards FL, Boonyarak P, 2021).

Therefore, the social benefits of vaccination largely depend on its scientific management.

The placebo effect is prevalent in various social activities during the COVID-19 pandemic. If there is a huge difference between the standards of clinical treatment guidelines („COVID-19 Treatment Guidelines“, 2024) and public expectations, the social benefits brought by the placebo effect will be immeasurable. If we try to consider the economic benefits of placebos, we should not consider the activities of health care institutions as the preferred way to achieve the placebo effect, although it may have more pronounced effects (Miller FG, et al, 2009). During the epidemic, it is very valuable to try to find other low-cost alternatives to achieve the placebo effect.

CONCLUSION

Our research showed that restrictive measures were not ideal for managing the COVID-19 outbreak because of their huge negative economic and social impacts. Mass vaccinations were not a reasonable solution to the epidemic and requires scientific management to be helpful. The placebo effect can produce economic and social benefits during the epidemic, but we need to try to find more economical methods. The experience in the prevention and control of the COVID-19 global pandemic provides valuable reference for improving public health management strategies for viral respiratory infectious diseases.

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THE IMPACT OF SHORT VIDEO MARKETING ON CONSUMER BEHAVIOR

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Abstract*: This article examines the impact of short video marketing on consumer behavior. It discusses the rising popularity of short video platforms like TikTok and explores key features of short video marketing such as low costs, rapid dissemination, high interactivity, precise targeting, stronger communication effects, and multi-dimensional presentation methods. The article analyzes different forms of short video marketing including original plots, influencer recommendations, and product placements. It highlights factors influencing the effectiveness of short video marketing such as video content quality, brand image, and dissemination channels. The impacts on consumer purchase decisions, information acquisition, brand awareness, and post-purchase evaluations are also explored. Finally, the article provides marketing suggestions for small and medium enterprises to leverage short video marketing effectively.*

Key words*: Short video marketing, Consumer behavior, TikTok, Social media marketing, Digital marketing strategies*

JEL classification: *M31*

1. SHORT VIDEO MARKETING BACKGROUND

The advent of the Internet has revolutionized communication, epitomized by its unparalleled efficiency and the dense proliferation of information. This digital evolution has elevated online social networking to unprecedented heights, unlocking novel prospects for growth and innovation.

In this era, the ubiquity of mobile technology has empowered individuals to document and broadcast their lives with ease. Smartphones have become the quintessential tool for creating and sharing short videos, a medium that has seen explosive growth in recent years. This surge has democratized content creation, enabling people from all walks of life to participate and engage.

The short video format has transcended social barriers, cultivating a diverse user base that spans various social strata. This inclusivity has forged new avenues for product marketing, offering brands a dynamic channel to reach a broad audience. The format's brevity and visual appeal resonate with the fast-paced lifestyle of modern consumers, making it an effective vehicle for capturing attention and conveying messages succinctly.

For instance, in China, the proliferation of new media platforms has been staggering. As per QuestMobile's data report, these platforms boast a staggering 1.088 billion de-duplicated active users, achieving an impressive penetration rate of 88.9%. Such figures underscore the vast potential of these platforms as a marketing medium, providing businesses with access to an extensive and engaged audience.

In summary, the short video phenomenon represents a paradigm shift in content consumption and distribution. Its rapid adoption across all demographics presents marketers with a unique opportunity to innovate and connect with consumers in a meaningful and impactful way. (Surge News, 2023) Among them, TikTok's active users reached 743 million, with a year-on-year growth rate of 5.1%, and TikTok's single-day usage time was 115.2 minutes in 2023.(Surge News, 2023) By embracing this medium,

businesses can navigate the digital landscape with agility and capitalize on the immense potential it holds for brand growth and engagement.

Table 1. Scale of De-Repeated Active Users and Network-wide Penetration Rate of Typical New Media Platforms in China

Year	Network-wide penetration rate (unite:%)	Scale of De-Repeated Active Users (unite: billions)
September 2018	64.6	0.723
September 2019	72.8	0.825
September 2020	78.5	0.906
September 2021	88.4	1.032
September 2022	87.2	1.043
September 2023	88.9	1.088

Source: QuestMobile TRUTH China Mobile Internet Database September 2023

Table2. Growth in active user scale of typical new media platforms in China

Year	Tiktok (unite: billions)	Weibo (unite: billions)
September 2022	0.706	0.490
September 2023	0.743	0.485
Year-on-year growth rate	+5.1%	-1.2%

Source: QuestMobile TRUTH China Mobile Internet Database September 2023

Table3. Changes in the average per capita single-day usage hours of typical new media platforms in China

Year	Tiktok (unite: minutes)	Weibo (unite: minutes)
September 2022	108.4	47.0
September 2023	115.2	46.2
Change in duration	+6.8	-0.8

Source: QuestMobile TRUTH China Mobile Internet Database September 2023

In addition, from the point of view of the use of behavior, people are basically using the application software from the time they wake up, especially in the morning commute, lunch breaks there is a significant increase in activity.(Surge News, 2023) It can be seen that the new media short video has been integrated into people's lives and become a part of life, which provides new opportunities for enterprise marketing.

In summary, the short video phenomenon represents a paradigm shift in content consumption and distribution. Its rapid adoption across all demographics presents marketers with a unique opportunity to innovate and connect with consumers in a meaningful and impactful way. By embracing this medium, businesses can navigate the digital landscape with agility and capitalize on the immense potential it holds for brand growth and engagement.

2. SHORT VIDEO AND SHORT VIDEO MARKETING MODEL FEATURES OF SHORT VIDEO MARKETING

Short videos are a way of distributing content over the Internet, and unlike traditional streaming videos, this video type is generally less than five minutes in length. Due to the popularity of mobile devices and the improvement of network speed, coupled with the design of network apps to provide great convenience, so that people's learning cost of apps is minimized, which makes this short, fast and large flow of dissemination of content gradually gained the favor of various platforms, networks, capital and other groups(Wang, 2024).

In terms of the current video status of each platform, each platform has its own advantages and characteristics. However, under normal circumstances, the unit of timing of short videos is usually seconds, and the time is mostly controlled within five minutes, and after the shooting is completed, it is uploaded through the Internet, and then created and shared on various platforms, which makes it possible for anyone to create and share short videos through mobile devices at any location. This means that any user can become a content creator, and the process is less expensive to learn and more efficient.

Compared with traditional text media, video media content is more abundant, more convenient in dissemination and creation, in addition to the ability to see all kinds of different content on the same platform and a richer choice, which is loved by the majority of users. It can be seen that the audience of short videos covers a wide range of

groups, and its groups include all kinds of people in society. Therefore, the marketing direction of many enterprises has begun to change, through the production of short video way to wear oh the promotion and publicity. And most of the short video Pingyao is also in the commercialization reform, their own e-commerce system and mode of improvement, so as to use short video to the enterprise's products to carry out more extensive publicity.

3. FEATURES OF SHORT VIDEO MARKETING

3.1. LOW COSTS

Because of the advantages and characteristics of the short video itself, many enterprises will use short video to promote and publicize their products and brands, so as to attract more consumers, thereby increasing their brand awareness and expanding the potential consumer base, stimulating consumer demand for purchase, thereby influencing people's purchasing decision-making behavior, and increasing people's willingness to buy and the chances of closing the deal.

With the development of time and technology, a variety of intelligent technologies and devices are widely used by people, consumers can more easily access to a variety of different information, which to a large extent reduces the cost of publicity, enabling enterprises to expand the breadth of marketing and reduce marketing costs, but also to the traditional advertising media to the dissemination of a certain degree of supplementation.

At the same time, consumers produce purchase behavior or search behavior, enterprises can through big data timely understanding of people's product preferences and preferences of the professional.

3.2. TRADITIONAL SPEED

The necessity of short videos for marketing is online platforms such as youtube, tiktok etc. Various media through various applications or other ways to account registration, and then video production, editing, beautification and so on. The audience of short videos is very broad, because the platform has a low barrier to entry and learning, and also has the characteristics of the Internet, such as inclusiveness and openness. When the video promotion can be publicized through fans and other users. This shows that the short video camp has obvious efficient characteristics, in addition to consumers can also through a shorter time on the product or even a certain degree of understanding of the enterprise. For the enterprise's publicity and awareness of the promotion of a greater enhancement, which is conducive to the development of consumer loyalty psychology and the potential purchase will, broaden the potential consumer population, and ultimately make the enterprise stand out in the commercial competition.

3.3. HIGHLY INTERACTIVE

Unlike traditional marketing methods, short video marketing is characterized by interactivity. In general, enterprises and consumers are the main body of interaction, generally many to one or one to many. Both sides in the interaction will not be subject to time or space constraints, the two sides through the network can be at any time or place for real-time interaction, this interaction can bring the relationship between enterprises and consumers closer, it is easier to establish emotional links, which enhances the affinity and cohesion of the brand. In addition, the establishment of user communities can also enhance the dissemination of enterprises and products and consumer recognition.

And because of its own strong interactivity, can have a direct impact on the overall marketing of the enterprise, because consumers can directly on the purchase of services or products for direct comments, and the results of the comments will be displayed to everyone for reference, which is the consumer can fully understand the quality of the product and the service situation, to a large extent, can improve the degree of trust in the product, so that consumers can according to their own needs to decide the purchase intention so as to enhance the brand affinity and cohesion. So that consumers can decide whether to buy according to their own needs to determine the intention to buy.

3.4. PRECISE MARKETING

Compared with the traditional marketing model, the network short video marketing model in addition to the advantages of dissemination speed, it is also based on the support of big data can be in line with the positioning of the enterprise's products for the depth of the user to dig and directional push, through the design of the keywords and capture the consumer population can be accurately classified, so that the enterprise side of the marketing will be more accurate and efficient can make the marketing of the purpose and efficiency is stronger.

3.5. STRONGER COMMUNICATION EFFECT

Video is a highly effective way of communication, it contains images, sound effects, text and a single traditional media is different, it contains the content and the emotions contained in a richer. The information content and emotions conveyed are also more diversified, and the image presented is more three-dimensional, which can attract the attention and interest of consumers to a greater extent, and is more likely to cause people's emotional resonance so as to produce long-term memory and emotional links with the enterprise.

3.6.MULTI-DIMENSIONAL PRESENTATION METHOD

Nowadays, with the rapid popularization of computer technology, people's daily life and work are inseparable from the network. In the information acquisition or entertainment activities are through the network, short video due to the often shorter and people's fragmented time has a good fit, people can watch short videos to relax and leisure after work and rest. And this form will be the promotion of more rich and diverse content, can be more comprehensive in a short period of time to show the whole picture of the product or service, so that consumers can have a more direct understanding.

4. THE FORM OF SHORT VIDEO MARKETING

From the current way of short video marketing, the more commonly used ways are, original plot mode, ppt display, broadcast demonstration, narration, anchor recommendation and other ways to carry out. And with the intensification of fierce competition, the way of ppt display and narration began to be eliminated because of the monotony of the content and the viscosity of the customer group is not strong. While the oral presentation is mainly used for live marketing, in terms of short video, it mainly focuses on anchor recommendation and original plot.

In the original plot needs to be shot and edited by the team to be completed, but it has the advantage of being able to have a good amount of interaction with consumers.

In terms of anchor recommendation, it is mainly divided into four types, i.e., product evaluation, drama, 'planting grass' type and Netflix star recommendation. The evaluation category is mainly divided into two modes one is the emotional mode and the other is the professional mode. The professional mode is the traditional technical analysis and then recommended, while the emotional mode is through the design of the corresponding scenarios and then mobilize people's willingness to buy. Drama class is in the production of a series of movies, animation, story marketing products implanted, this implantation can not be too rigid in the production of the implanted content will generally be combined with the content of the story in the video, so that the implanted content will not show a sudden feeling. This way the audience is wider and has a certain stickiness.

And the most direct thing 'grass' mode, this mode is generally demonstrated by the netroots evaluation, and then directly to the fans to recommend. Through their own influence and inciting or stimulating language to potential consumer groups to stimulate(Gan, 2020), but the need for dialog compilation to achieve the desired marketing effect. This way is mainly by virtue of the traffic and fan stickiness carried by the Netflix star himself to play the star effect, and then form a short video with goods, this method has a high revenue conversion rate.

5. INFLUENCING FACTORS OF SHORT VIDEO MARKETING

5.1. CONTENT QUALITY OF THE VIDEO

According to the theory of narrative transmission, the content of the story can seriously affect people's recognition of the video and the degree of commitment, so the marketing of short videos is also closely linked to the content of the video(Pachucki et al., 2022). Consumers are more tolerant of interesting content, on the contrary, if the content is relatively monotonous and boring, there is no way to attract people's attention, or even make people have aversion to the mood, which will lead to the failure of marketing.

For example, the short video through creative animation will be the life of general knowledge and product combination, so that people feel full of fun at the same time can also be a good acceptance of the marketing of goods.

Secondly, the factor that can influence consumers to watch short videos is the length of the video, too long short videos will make people's desire to watch lower.

5.2. BRAND IMAGE

When people are shopping for products or services, they generally tend to pay more attention to products with high visibility, good brand name and clear image. The brand image and visibility can be enhanced through short video marketing, such as in the quality of the product, the market as a reasonable marketing can establish the brand

image(Zeng, 2021), so that the enterprise's communication is more efficient.

5.3. DISSEMINATION CHANNELS

The dissemination of short videos is inseparable from the choice of dissemination platform, if you want to get a better dissemination effect of marketing then in the dissemination of the selection of the channel is an especially important part. At present, tiktok, youtube and other platforms have broadened the short video marketing path(Jain & Goswami, 2013). For example, totik has iterated a unique and accurate user profiling and content recommendation algorithm, which can greatly improve the accuracy of video placement, thus making marketing more efficient(Jennings, 2022).

6. THE IMPACT OF SHORT VIDEO MARKETING ON CONSUMER BEHAVIOR

6.1. IMPACT ON CONSUMER PURCHASE DECISIONS

Network video marketing is the marketing content in the form of advertising in front of consumers, but also because of interactivity and other categories as filler makes people's perception of the ads have a weakening effect, it can also directly stimulate the consumer's willingness to buy and create demand(Utami et al., 2022). In addition, in terms of display, consumers can visualize the various parameters of the product and the use of the scene, and then judge whether it can meet their own requirements.

Secondly, the short video platform is also a network social platform, consumers can understand the feedback of other buyers before purchase, which can improve the trust of people on the product, and then enhance the willingness to buy.

6.2. IMPACT ON INFORMATION ACQUISITION BEHAVIOR

In the role of the network, people's access to information has a greater broadening of the channel, and the traditional marketing model is different, the content of network marketing is richer, network marketing methods and approaches to a variety of forms, people can through the way of video can be intuitively understand the situation of the product, and at the same time access to relevant data information. Therefore, network video marketing can have a greater impact on consumer information behavior, accelerate people's access to product information, people can quickly make purchase decisions.

6.3. INFLUENCE ON CONSUMER BRAND AWARENESS

Online video marketing can expand the popularity of the company in a certain is, enhance customer recognition and trust of the company(Hoi & Yin, 2023). Enterprises through the production of beautiful video to enhance the brand image in people's minds, widely publicized in the network, so that consumers can fully understand the brand characteristics and product culture.

6.4. EVALUATION OF CONSUMERS AFTER PURCHASE

Post-purchase evaluations are a critical juncture in the consumer journey, where individuals reflect on their experience with a product or service to assess its value and their decision-making process. This introspection often culminates in feedback that can be pivotal for businesses seeking to refine their offerings.

Consumers' assessments post-purchase are informed by their personal experiences, which they use to gauge the correctness of their buying decisions. It's imperative for businesses to actively gather this feedback, as it serves as a barometer for customer satisfaction and product performance. Timely collection and analysis of this data enable businesses to enhance and innovate their products or services, ensuring they evolve in tandem with shifting consumer preferences.(Akter et al., 2016)

While consumer feedback is invaluable, it's essential to acknowledge that it may not always be entirely accurate or objective. Personal biases and unique circumstances can color individuals' perceptions, leading to feedback that might not fully encapsulate the broader consumer experience.

Businesses must, therefore, approach this data with a discerning eye, parsing through it to identify genuine areas for improvement. Engaging in open dialogue with consumers can shed light on the nuances behind their feedback, revealing underlying issues and opportunities for growth. This two-way communication fosters a deeper understanding of consumer needs and expectations, guiding businesses toward sustainable and positive development.

To capitalize on consumer feedback, businesses should:

1. Implement robust systems for collecting and managing customer data.
2. Employ analytical tools to distill actionable insights from consumer feedback.

3. Foster a culture of open communication with customers, encouraging honest and constructive criticism.
4. Regularly review and adjust product offerings in response to consumer trends and feedback.
5. Balance consumer insights with market research to maintain a well-rounded perspective on product development.

In conclusion, while consumer evaluations post-purchase are subjective, they are a goldmine of insights for businesses. By systematically collecting, analyzing, and acting upon this feedback, enterprises can ensure their growth is aligned with consumer needs and market dynamics, paving the way for long-term success and customer loyalty.

6. SMALL AND MEDIUM ENTERPRISES (SMES) MARKETING SUGGESTIONS

Marketing is a pivotal element in the operational framework of a business. Effective marketing strategies not only enhance efficiency but also bolster the sustainability of business operations. Particularly for small and medium-sized enterprises (SMEs), short video marketing emerges as a potent tool, offering a blend of cost-effectiveness and creative liberty.

Firstly, short video marketing stands out for its affordability compared to traditional marketing avenues. SMEs can harness their unique resources and ingenuity to craft compelling video content that captivates consumers without incurring hefty expenses. This approach not only garners consumer attention but also amplifies the marketing impact.

Moreover, SMEs exhibit greater agility in product positioning and customer segmentation. With a more concentrated customer base, these enterprises can easily delineate a precise customer profile. This enables them to tailor their video content to resonate with the audience's preferences, thereby effectively communicating the product's attributes alongside the company's ethos and vision. The result is an enhanced product and brand visibility, coupled with increased exposure.

Nonetheless, short video marketing is not devoid of challenges. SMEs often grapple with resource constraints, making it arduous to execute large-scale video promotions swiftly. Additionally, the relatively modest brand presence of SMEs necessitates enduring promotional efforts to foster consumer trust.

The inherent nature of short video marketing demands high-caliber creativity and content. Enterprises may need to invest considerable effort in refining their content to meet these standards.

To counterbalance these drawbacks, SMEs can adopt specific strategies to refine their marketing approach. Conducting thorough market research to gauge contemporary consumer inclinations, interests, and necessities can pave the way for precise market and product alignment. Subsequently, SMEs can craft and disseminate targeted short videos that resonate with the defined user personas.

Emphasizing innovation and distinctiveness is crucial. By presenting unique concepts or content, SMEs can attract a broader consumer base and stand out in the competitive landscape.

Lastly, it's imperative for companies to underscore the interactive and social facets of short video marketing. By reinforcing these aspects, businesses can more readily forge an emotional connection with consumers, which not only engenders brand loyalty but also facilitates ongoing dialogue. Such interactions keep businesses attuned to societal shifts and consumer predilections, enabling them to navigate market dynamics with greater acumen and strategically steer their operations.

In essence, while short video marketing presents certain hurdles for SMEs, a strategic, innovative, and consumer-centric approach can transform these challenges into opportunities for growth and market prominence.

CONCLUSION

To summarize, enterprises should take the needs of consumers as the core when presenting content and scene building for people and after the transaction, because the needs of consumers are variable. Want to make the short video promotion and conversion more accurate, we need to start from the consumer demand as a starting point, the enterprise products for precise positioning, the marketing content is carefully designed, but also need to carry out some personalized settings, so that with the needs of consumers match. At the same time, enterprises should pay attention to the short video marketing with the network social attributes it reflects the data and user feedback allows enterprises to adjust products and understand the consumer preferences in a timely manner to change the trend of these information can make the enterprise's operation more stable, and secondly, this social attributes can reduce the consumer's psychological defense mechanism,

which will make the enterprise's efficiency improved, but also over the establishment of long-term corporate value and popularity enhancement in the minds of consumers. The value and popularity of the promotion. It can be seen that short video marketing has a broad space for development, enterprises can try to use this way of marketing, in order to improve the visibility of enterprises and expand market share.

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DEPOPULATION AS A DEVELOPMENT CHALLENGE FOR SERBIA

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***Abstract**: Europe is sometimes called the "old continent" because of its long and rich history. This nickname is also justified by the harsh truth that the process of depopulation in European countries is increasingly pronounced, just like the process of population aging. According to forecasts, in the next 50 years, the population of Europe will make up only 4% of the world's population. Serbia, like the countries in the region, is not spared from this growing trend of depopulation. Moreover, the population of Serbia belongs to the fastest-declining population in the world. With an average age of 43.8 years, it is one of the oldest in Europe. The 21st century is the century of aging, but also the century of migrations, which are somewhere in the low birth rate, brain drain, and accelerated aging of the population. The depopulation process in Serbia is dislocated differently and is more visible in rural and mountain areas, compared to urban areas. The average age of people in rural areas exceeds 65 years. The able-bodied population is mostly concentrated on the Belgrade-Novi Sad axis (developed north) due to better living and working conditions. Serbia did not deal with demographic policy in time and is now paying the price for it in economic, developmental and social terms. Since without human capital, any development, even economic, is not possible, the author tried to point out the concrete economic consequences that depopulation and demographic transition in Serbia gave birth to.*

***Key words**: depopulation, demography, transition, development, economic consequences, Serbia*

***JEL classification:** R23, J11, O18, P25*

1. INTRODUCTION

The age structure of the population is considered one of the most important demographic characteristics of any population. It develops over a longer period under the influence of birth rates, mortality, the scale, and intensity of population migration flows. The current picture of the age structure of a population provides valuable information about the level of development reached by the population. Likewise, it serves as the foundation for making estimates and projections of the population, which define strategies and policies related to population aging.

Population aging is a phenomenon that has become increasingly prominent in professional and scientific circles, especially in the second half of the 20th and first half of the 21st century. The reason for this lies in the fact that this process, with its attained level, raises important questions regarding the socio-economic and demographic development of the country. Demographic aging of the population is most often the result of a significant decline in fertility, as well as a significant increase in life expectancy.

The leading challenge Serbia faces in the post-pandemic period is depopulation, manifested through a decrease in the number of inhabitants and their accelerated aging. Depopulation is a process that implies a numerical decrease in the population of a country. This understanding can be characterized as a narrower interpretation. The process of depopulation includes, besides the aforementioned, qualitative changes such as urbanization, population aging, and demographic imbalance between different areas of the country. Historically, the decline in Serbia's population in earlier periods was not beyond the control of ordinary people and was most often defined as a logical consequence of wars, conflicts, and/or diseases. The reasons for the population decrease in the current period are significantly different. Their cause lies in individual decisions of people not to have children or to have fewer children, and to migrate to other countries to continue their lives there (Lutz and Gailey, 2020).

The transformation of the age composition of Serbia's population, realized through a decrease in the proportion of young people and an increase in the proportion of elderly, is fully in line with European trends. If we observe the period from the second half of the last century, we can see that the aging process of Serbia's population was faster

compared to the aging of Europeans, although Serbia's population was younger compared to the population of Europe as a whole. The mentioned differences in the age structure of Serbia's population and Europe have been decreasing over time, ultimately reaching a minimum by the end of the 20th century.

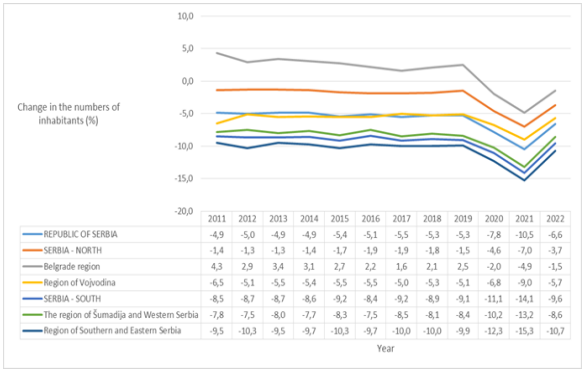
Although the connections between demographic changes and development are not straightforward, previous experiences and research show that population changes affect development and vice versa (Ahlburg and Cassen, 2008). Most of the available literature deals with the study of population growth, rather than decline, and its subsequent impact on the poverty of inhabitants, women's freedom of choice, and the availability of public services (UN, 2020). The reason for this is the limited experience of countries regarding population decline and the impact of this demographic phenomenon on the social and economic aspects of existence. Previous experiences, albeit limited, have shown that population decrease, in synergy with the rapid aging of the population, has an extremely negative impact on well-being, inequality, productivity growth, technological progress and innovation, as well as on the economic development and investments of a country. Large pressures on social security systems are a consequence of, on the one hand, a smaller number of workers who partially finance pensioners and the health and social protection system with their earnings, and on the other hand, an increase in the number of pensioners and dependents due to the accelerated aging of the population. These processes lead to the popularization and growth of metropolitan areas, at the expense of rural and smaller urban regions. Reduced workforce, declining birth rates, insufficient number of experts in rural areas and smaller cities contribute to reducing the potential for development and motivation for investing in already underdeveloped areas. All of this leads to the relocation and/or closure of public institutions and enterprises to larger centers, the closure of entire communities, and the degradation of the well-being of individuals and households (Coleman and Rowthorn, 2011; van Dalen and Henkens, 2011; Beunen, Meijer and de Vries, 2020; Hospers and Reverda, 2014; Reher, 2007).

Considering these profound and fundamental demographic changes that evidently create a new reality, it is clear that the future of Serbia largely depends on how it will adapt to and react to this new reality and the challenges it brings. Population depopulation cannot be viewed solely as a demographic and social phenomenon and/or change, but as a major challenge on the path to the future growth and development of Serbia. The purpose of this paper is to point out the current demographic challenges faced by Serbia as a developing country, and to emphasize the need for adequate adaptation to demographic changes since they have a strong impact on the economy and the overall society.

2. CURRENT DEMOGRAPHIC CHALLENGES IN SERBIA

Serbia ranks among the countries with the highest depopulation rates in the world. As we can see in Figure 1, the trend of negative population growth rates in almost all regions of the country (with the exception of the Belgrade region) has not changed over the years.

Figure 1. Population Change (%) from 2011 to 2022

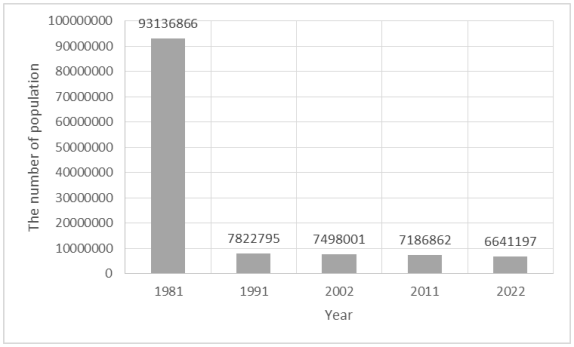


	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
REPUBLIC OF SERBIA	-4,9	-5,0	-4,9	-4,9	-5,4	-5,1	-5,5	-5,3	-5,3	-7,8	-10,5	-6,6
SERBIA - NORTH	-1,4	-1,3	-1,3	-1,4	-1,7	-1,9	-1,9	-1,8	-1,5	-4,6	-7,0	-3,7
Belgrade region	4,3	2,9	3,4	3,1	2,7	2,2	1,6	2,1	2,5	-2,0	-4,9	-1,5
Region of Vojvodina	-6,5	-5,1	-5,5	-5,4	-5,5	-5,5	-5,0	-5,3	-5,1	-6,8	-9,0	-5,7
SERBIA - SOUTH	-8,5	-8,7	-8,7	-8,6	-9,2	-8,4	-9,2	-8,9	-9,1	-11,1	-14,1	-9,6
The region of Šumadija and Western Serbia	-7,8	-7,5	-8,0	-7,7	-8,3	-7,5	-8,5	-8,1	-8,4	-10,2	-13,2	-8,6
Region of Southern and Eastern Serbia	-9,5	-10,3	-9,5	-9,7	-10,3	-9,7	-10,0	-10,0	-9,9	-12,3	-15,3	-10,7

Source: Authors according to data collected from the website of the Statistical Office of the Republic of Serbia.

Currently, the country has 6.64 million inhabitants (according to the 2022 census), which is almost one million fewer people compared to the census from 2002 (see Figure 2).

Figure 2. Population Change (%) from 2011 to 2022



Source: Authors according to data collected from web-site of Statistical Office of Republic of Serbia.

The question arises, why is this so? The answer is multifaceted. Depopulation in Serbia is a kind of mix of trends that affect most countries in Southeastern and Eastern Europe. On one hand,

such a trend has been facilitated by decades-long emigration, characteristic of developing countries with lower or middle incomes. According to Stanojević et al. (2022:41), "Around 60,000 people leave Serbia every year, with about 15,000 to 20,000 more people leaving than returning each year. OECD (2020) estimates that "over the past two decades, more than 650,000 people have left Serbia, mostly young people." The reason for this situation lies in the fact that neighboring European countries with strong economies seek educated workforce from Serbia and offer better living and working conditions in return. "According to the World Economic Forum's measurements, Serbia's ability to retain its talent or prevent 'brain drain' currently ranks among the worst of all countries in the region and beyond, placing Serbia at 134th out of 137 countries included in the assessment" (Stanojević et al., 2022:41). In terms of the structure of human capital leaving the country in search of a better life, it can be noticed that it is mostly highly educated professionals or low-skilled individuals (willing to perform the simplest jobs). Considering Serbia's economic power and the fact that, as a country, it cannot afford the luxury of its most valuable capital "draining" from the country, a specific problem and question that must be addressed is how to reduce and transform "brain drain" into "brain circulation" (return of highly educated population to the home country and its permanent employment).

In addition to the above, Serbia's accelerated depopulation process is influenced by years of low fertility rates (Table 1), rapid population aging (Tables 2 and 3), and the trend of increasing the coefficient of total population dependency and dependency of the elderly population (Table 4).

Table 1: Total fertility rate

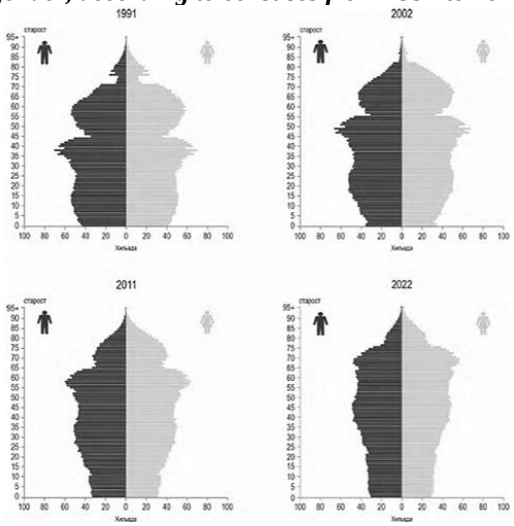
Indicator	Year	Teritory - NSTJ				
		Republic of Serbia	Belgrade Region	Vojvodina Region	The region of Šumadija and Western Serbia	Region of Southern and Eastern Serbia
Total fertility rate (number of children per woman)	2011	1,40	1,44	1,38	1,40	1,35
	2022	1,63	1,58	1,67	1,67	1,56

Source: Authors according to data collected from web-site of Statistical Office of Republic of Serbia.

The population of Serbia is undergoing a profound aging process. It is a worrying trend that has been increasing for decades (see Figure 3). Population aging can be observed in two ways. Aging driven by low birth and fertility rates and a reduced share of young population in the total is defined in the literature as "bottom-up aging". On the other hand, aging resulting from the increase in the share of population aged 65+ years is referred to as "top-down aging". There is no consensus in scientific and professional circles regarding a single indicator of demographic population aging, but indicators such as the aging index (see Table 2), average age of the population (see Table 3), and dependency ratios (see Table 4) are most commonly used for this purpose. What scientists have agreed upon is that the aging process is primarily a result of low fertility, but it is also significantly influenced by the increasing life expectancy of people.

As seen in Figure 3, the age structure depicted in the age pyramid from 1991 was predominantly defined by the size of the incoming cohort in the age group of 65 to 69 years. The number of individuals in this age group was two and a half times larger than the cohort of individuals aged 80 and above. In the figure showing the results obtained from the 2002 census, we can observe a significant expansion of the base of the elderly age pyramid. In other words, there was a so-called demographic rejuvenation resulting from high birth rates recorded between the two world wars.

Figure 3. Population of Serbia by age and gender, according to censuses from 1991 to 2022.



Source: RZS. (2022).

On the age pyramids reflecting the last two censuses (2011 and 2022), we can see a complete demographic aging of the elderly population. The

aging index in all regions of Serbia has significantly increased compared to the previous census in 2011. Differences between urban and rural areas, as well as between the developed north of the country and the less developed south, are noticeable in terms of this indicator, to the detriment of rural areas and the underdeveloped south of Serbia (Table 2).

Table 2: Ageing index by type of settlement

Year	Type of area	Teritory -NSTJ						
		Republic of Serbia	SERBIA - NORTH	Belgrade Region	Vojvodina Region	SERBIA - SOUTH	Region of Šumadija and Western Serbia	Region of Southern and Eastern Serbia
2011	Total	121.9	119.3	122.9	116.4	124.4	119.4	130.8
	Urban settlements	112.3	120.1	125.6	114.1	102.2	99.4	105.6
	Other	136.0	117.6	112.5	119.6	147.4	138.9	159.0
2022	Total	149.7	139.7	132.9	146.3	160.6	155.5	167.7
	Urban settlements	136.3	134.5	130.4	139.8	138.9	134.8	144.2
	Other	173.1	153.2	144.6	157.1	186.5	178.7	198.1

Source: Authors according to data collected from web-site of Statistical Office of Republic of Serbia.

The average age of the population in Serbia has a consistent upward trend (Table 3). According to data from the 2022 census, we can conclude that the average age of the population has increased by a year and a half (on average) compared to the average age recorded in the 2011 census. The oldest residents are in the municipality of Crna Trava, located in the southernmost part of the country, with an average age of 56.37 years, while the youngest residents are in the municipality of Tutin, located in the Šumadija and Western Serbia region, with an average age of 34.60 years.

Table 3: The average age of the population between the two censuses

Year	Teritory - NTSJ						
	Republic of Serbia	SERBIA - NORTH	Belgrade Region	Vojvodina Region	SERBIA - SOUTH	Region of Šumadija and Western Serbia	Region of Southern and Eastern Serbia
2011	42.1	41.7	41.7	41.7	42.5	42.2	42.8
2022	43.8	43.2	42.7	43.6	44.5	44.3	44.8

Source: Authors according to data collected from web-site of Statistical Office of Republic of Serbia.

Alongside the increase in the aging index and the average age of the population, dependency ratios (total dependency and dependency of elderly individuals) are also rising in all regions, but the highest rates are still present in underdeveloped regions of southern Serbia (Table 4).

Table 4: Dependency ratio by type of settlement

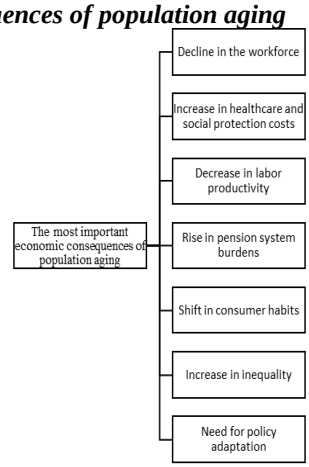
Indicator	Year	Teritory - NSTJ					
		Republic of Serbia	SERBIA - NORTH	Belgrade Region	Vojvodina Region	SERBIA - SOUTH	Region of Šumadija and Western Serbia
Total dependency ratio (%)	2011	46,3	44,0	43,5	44,3	48,7	47,8
	2022	57,3	55,9	54,8	56,8	58,9	59,0
Dependency ratio of the elderly population (%)	2011	25,2	23,4	23,4	23,5	27,1	26,0
	2022	34,7	32,6	31,4	33,9	36,9	36,4

Source: Authors according to data collected from web-site of Statistical Office of Republic of Serbia.

3. THE MOST IMPORTANT ECONOMIC CONSEQUENCES OF POPULATION AGING

The economic consequences of declining population receive less attention in the professional literature compared to the economic consequences of population aging. The reason for this can be found in the initial (misguided) understanding of population decline as a transient phenomenon. Population decline causes numerous economic consequences and induces changes to which transition economies must adapt adequately and promptly (Figure 4). Primarily, the change in population size creates significant adjustment costs for societies affected by transitional changes. On the other hand, all of this leads to changes in spatial distribution of the population as well as changes in wealth distribution among so-called post-populations (Stanojević et al., 2022).

Figure 4. The most important economic consequences of population aging



Source: Author.

The process of population decline leads to certain imbalances in society that must be addressed to restore balance in a timely manner. Primarily, population aging is classified as one of the reasons for population decline and the increasing economic dependency of the older population on the eco
nomically active population. This imbalance can be reduced by investing in human capital, increasing the participation of women (as a marginalized group in the labor market) in the workforce, and raising the existing retirement age. Another imbalance observed in practice is the imbalance in the geographical distribution of the population, which is a result of strong interregional migrations within the country, most often between rural areas (villages and small towns) and urban areas (major cities). Many young and economically active individuals migrate to large cities in search of better living conditions, prospects, and opportunities for progress. They often leave behind older and less qualified individuals as caretakers of their homes in rural areas. In the context of this demographic-spatial imbalance, it is important to encourage the development of medium-sized cities as they serve as a link between major urban centers and villages and small, underpopulated towns. Population decline through the process of reduced economic activity inevitably leads to a decrease in the overall GDP or, at best, slows its growth in the country.

The economic consequences of depopulation are not always negative. Lower population growth, viewed in the context of less dilution of capital, can also be seen as beneficial as it increases income per capita, as it requires lower capital investment in equipping new workers with capital. Additionally, lower population growth encourages greater participation of women in the labor market and contributes to their increased participation in the workforce.

On the other hand, according to Stanojević et al. (2022), there are "possible compensation effects that negatively affect per capita income in the case of lower population growth: the effects of scale (or reverse scale effects) of declining population can lead to reduced specialization and slower innovation, as well as imbalance in labor supply and demand, leading to mismatch and possible brain drain effects (in open economies), especially if there is selective migration".

Taking all of the above into account, theoretically speaking, the question arises whether the economic consequences of population decline are positive or negative. Empirical and precise answers are still lacking. What is certain is that Serbia must take all necessary steps to combat the potentially negative effects of depopulation and continuously invest in human capital through the healthcare and education systems to compensate for the reduction in the number of workers in the labor market. Automation in the era of the digital revolution is certainly one of the possible responses to the challenges of depopulation, but currently, it is a tool used by much more advanced economies compared to the economy of Serbia.

4. SPATIAL ASPECTS OF DEPOPULATION IN SERBIA

Depopulation of rural areas has been a well-known demographic phenomenon in Serbia since the 1960s. All national spatial plans over the past 60 years have indicated this demographic-spatial imbalance, and most measures taken to overcome it have been ineffective. The decline of socialism triggered the depopulation process at all spatial levels, causing uncontrolled deindustrialization, which initiated the depopulation process even in

urban areas. Serbia, like most former socialist countries in Europe, has not remained immune to this demographic-spatial pattern. "The main reasons for urban decline are often cited as problems in restructuring the urban economy, while other significant factors include administrative and territorial division constraints, the influence of boundaries and areas of influence, changing demographic, social, and environmental patterns at the local, regional, or national level, and accessibility and networking issues" (Martinez-Fernandez et al., 2012). The first signs of population depopulation in major cities such as Belgrade, Novi Sad, Niš, and Kragujevac were recorded during the 2002 census. The declining trend in urban population was continued and recorded in the censuses conducted in 2011 and 2022 (the latest population census), officially confirming the demographic crisis at the state and urban levels. The causes of all of the above should be sought in the fact that power in Serbia is centralized in large cities. The middle level of government in the form of administrative districts as independent entities does not exist, leading to the conclusion that medium-sized cities in the country actually lack the necessary economic power, and their social and demographic capabilities are limited and denied. Thus, medium-sized cities are legitimately deprived of the power of connection and bridging the imbalance between villages and large cities. The importance of internal spatial balance is significant when it comes to the demographic development of Serbia. The reason for this is that Serbia does not have external sources for repopulating devastated areas, as it simply does not border countries that are tourism significant or economically highly developed. Practice shows that there is no global solution for urban decline, but solutions should be sought by combining international guidelines and recommendations with local and regional characteristics (Haase et al., 2014).

CONCLUSION

On the threshold of the fourth industrial revolution, human resources are characterized as the most important economic resource, and investing in them is an investment in the future. For years, Serbia has faced a shortage of human resources and must take vital steps to address this issue accordingly. The future society that Serbia is moving towards is a society that is smaller in scale, predominantly urban, and significantly older. To transform this society into one capable of harnessing the benefits of the ongoing digital revolution, it is necessary to change the understanding of aging, migration, and gender roles and emphasize the importance of social inclusion (as a key tool for halting the population decline trend) and orientation toward medium-sized cities as a kind of transition between villages and large cities.

One of the consequences of Serbia's demographic aging is the significant pressure on the public services sector. The increase in demand for long-term care services (which are currently almost non-existent in Serbia) and geriatric services is certain (Matković, 2012). However, the main challenge we will face as a country is not infrastructure, but rather the lack of potential employees who could provide these services. "According to the most likely outcome of the forecast scenario, which assumes Serbia's accession to the EU at the beginning of the next decade, the number of inhabitants in 2051 compared to 2011 would decrease by 29%, the labor force volume by 23%, while the coefficient of dependence of the elderly would increase by as much as 90%, and certainly by 50%. At the same time, the coefficient of economic dependence would decrease by 15%, which would still be significantly above the European average" (Nikitović, 2013:204). The shortage of qualified labor in the future will be acute and will be addressed in one of the following two ways: a) engaging marginalized groups in the labor market in performing atypical jobs (part-time jobs, "time-share" jobs, "online" jobs) b) increasing the retirement age.

Serbia belongs to the group of countries that apply a "pay as you go" social protection system, which is implemented so that currently employed population, through social security contributions (from their earnings), finances retirees and inactive individuals over 65 years of age. Bearing this in mind, it is evident that the current combination of decreasing labor force and increasing number of retirees will have a devastating impact on the social protection system in Serbia. The consequences of reduced pension fund revenues and growing pressure on it are the impossibility of paying guaranteed pensions from the budget in the future, which necessitates the need to supplement household living with life savings (if they exist at all), further reducing pensioner bank savings and investments. The enumerated challenges can be preempted by taking steps that would contribute to increased economic activity and, accordingly, increasing the volume of the workforce. A fertility growth strategy aimed at rejuvenating the workforce is an effective instrument of demographic policy, but only if viewed in the long term. Working on the accelerated transformation of Serbia into a net immigration country, as well as promoting policies aimed at supporting childcare, household

role-sharing, and balancing family life and employment (Palomba, 2003), would contribute to improving the current demographic-economic situation of the country in the short and medium term.

From all the above, we can conclude that a synergistic effect of a wide range of applied policies and action steps is needed to prevent dramatic consequences of demographic changes in the near future. The best magnet for attracting quality labor force is undoubtedly the good economic performance of a country and favorable socio-economic factors that would stimulate immigration flows and rejuvenate and renew the existing workforce, providing almost instantaneous results, which is more than significant for Serbia and its position.

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Review Article

THE IMPACT OF THE INTERNET OF THINGS ON DIGITAL BUSINESS TRANSFORMATION

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***Abstract**: The term "digital business transformation" refers to the integration of digital technologies into the business processes of an organization. The process of digital business transformation extends from the moment of implementation to the full integration of digital technologies into the organization's business processes. Rapid technological advancement brings numerous advantages to people, both in their personal and professional lives. The application of modern technologies significantly facilitates daily functioning for individuals and provides numerous benefits in business processes, the most important of which is cost savings, which, together with overall revenues, generate profits for companies. The goal of every company is to minimize costs to maximize profits, a goal that is achieved through digital business transformation. In addition to cost reduction, digital business transformation also leads to reduced waste in production processes, which is also of utmost importance for businesses, as well as reduced costs of utilities while also ensuring an improved customer experience. This paper analyzes the role of digital business transformation in the business environment. First, the concept of digital transformation will be defined. Then, some of the most significant digital technologies enabling digital business transformation will be explained. This part of the paper will describe Internet of Things technology as one of the key technologies enabling digital business transformation. Finally, the key advantages and disadvantages of digital business transformation for organizations will be described. The progress of technology cannot be avoided; instead, it must be followed to maintain a competitive advantage in the market, which is the main goal of every business entity.*

***Key words**: Digitalization, digital business transformation, digital economy, digital technologies, IoT (Internet of Things), artificial intelligence*

***JEL classification:** O30, O33*

1. INTRODUCTION

Many often confuse the terms digitization, digitalization, and digital transformation because all three are different concepts, so we will define each of them separately. The term digitization refers to the process of creating digital forms of information that were previously analog. An example of digitization is the creation of digital records of various documents that were originally written on paper, either manually or using a typewriter, as well as the creation of digital forms of photographs, videos, audio recordings, and the like. Digitalization, on the other hand, involves the use of existing technologies and collected information to improve business processes or replace existing ones. Digitalization aims to achieve numerous goals, with one of the most significant being the creation of profit and an environment necessary for so-called "digital business," where information plays a primary role. An example of digitalization is transferring documents from a computer to the cloud and sharing such resources with others to provide faster and easier access to these resources. Digital transformation, finally, refers to the comprehensive integration of digital technologies into all areas of business. Digital transformation achieves fundamental changes in the business of an economic entity and the delivery of realized value to its customers.

Every economic entity that undergoes the process of digital business transformation radically changes its model of conducting business. Business processes are completely changed, enabling the generation of new revenue streams for every economic entity that decides to implement a digital business transformation. The rapid development of technology has facilitated the execution of numerous business processes that were much more difficult and different in the past using traditional methods of doing business.
Further development and advancement of technology and the creation of computers as we know them today have greatly facilitated not only manufacturing but also service activities. For example, medicine as we know it today is entirely different from what it was without the use of technology. Many devices used in medicine today have facilitated the diagnosis and treatment of numerous conditions or diseases, and today, thanks to digital transformation, it is possible to predict the further course of disease progression with great precision. In addition to medicine, agricultural production has also made a breakthrough thanks to digital transformation. Numerous devices and technologies present globally and gradually becoming increasingly present in our market enable the prediction of numerous conditions related to crops, such as drones used for early detection of crop diseases and for treating crops with pesticides and insecticides.

As we can see, digital transformation has not only affected business but also many other areas. Unfortunately, attitudes towards technology are still divided, although, over time, many who have a pronounced animosity towards it are slowly beginning to use it to the extent necessary for them. There are numerous advantages that digital business transformation brings, but also disadvantages. IoT (Internet of Things) is a technology that, together with mobile technologies, big data technologies, and cloud computing technologies, plays a crucial role in digital business transformation. These technologies enable the collection of vast amounts of data, their storage, and analysis, so that the collected and analyzed data can be further used to improve efficiency, productivity, and innovation within the organization. In the following work, digital business transformation will be explained, as well as the technologies that support this process.

Numerous pieces of literature investigate the digital transformation of business, on the basis of which it can be concluded that this topic is very important and current. During the preparation of this paper, data collected from secondary data sources was used. The methods used in the preparation of this paper are the methods of induction, deduction, analysis and synthesis, and description.

2. LITERATURE REVIEW

Ismail, Khater, and Zaki (2017) state in their work that digital transformation has become a key topic for many companies worldwide over time. They also believe that many companies that, for various reasons, do not want or cannot adapt to the digital world may disappear and lose market competition as it stands today. They also believe that only companies that keep up with emerging technological trends will continue to exist and successfully deal with all the challenges they face in the market. According to these authors, digital transformation is described as the integration of digital technologies and business processes in the digital economy. Digital transformation aims to affect three organizational dimensions: external, internal, and holistic. Regarding the external dimension, the focus is on digitally enhancing the customer experience and changing the lifecycle. In terms of the internal dimension, the focus is on business operations, decision-making, and organizational structure. As for the holistic dimension, it signifies the impact of digital transformation on all business segments and functions, resulting most often in the development of new business models.

Vujović (2020), in his work, states that digital transformation began in the 1960s with the emergence of mainframe computers. With the appearance of these computers, the process of developing programs and application software designed for automatic data processing began, which significantly contributed to increased productivity and global economic development. Companies use information technologies to ensure the development of new business models, products, and services, leading to changes in existing processes and value chains. Vujović also notes that digital transformation changes the way companies operate and changes the awareness of all employees. The three components defining the digital transformation of modern companies are: the digital work environment, the digital user experience, and digital business models and ecosystems. The digital work environment involves the use of mobile technologies (tablets, laptops, etc.), collaborative tools, and social networks, as well as the use of technologies initially intended for private users. The digital user experience refers to the user experience, which is a key factor in the digital transformation process, as every negative experience affects the

perception and sales of products. As for digital business models and ecosystems, it is considered that any company that does not connect and develop jointly with other companies will not be able to withstand the competitive pressures in the market. By working together, companies can increase their market value, develop new sales, production, and business models, and create new digital ecosystems.

Kahrović (2021) believes that the digital economy, based on digital technology, influences the creation of the concept of digital business transformation. The term digital transformation refers to a process that begins when an organization starts thinking about introducing digital technologies in all areas of its business. This process lasts until digital technologies are fully integrated into the organization's business. The goal of digital business transformation is to improve business performance, and without it, business is not possible. Today, there are many examples of organizations in whose work digital technologies are essential, and some of the companies whose businesses would be unthinkable without the use of digital technologies are: General Electric, Netflix, Uber, Airbnb, Booking, PayPal, and so on. Kahirović (2021) also believes that the process of digital business transformation takes place through the formulation of corporate strategic directions, i.e., the way in which the company's digital transformation will take place. This process should be integral, resulting in changes not only in the offer of products and services but also in terms of business processes, organizational changes, changes in organizational culture, and changes in the organization's position in the digital market.

Burilović (2020) defines digital business transformation as a change in the way digital technologies are used to develop a new business model that enables the creation and provision of greater value to consumers. Technological advances have accelerated the process of digital transformation to such an extent that managers and entrepreneurs believe that digital transformation can simultaneously be an opportunity and a threat. According to estimates by CISCO Systems, it was considered that by 2023, there would be more than 29 billion devices connected to the Internet, and this growing trend will continue in the future. This group of devices includes smartphones and IoT devices, or smart devices. Also, Burilović (2020) believes that for successful digital transformation, a change in mindset and corporate culture of the organization is necessary, which is also considered one of the most important dimensions of the digital transformation process. It is believed that a company that successfully undergoes the process of digital business transformation thereby ensures a long-term perspective of sustainable business and maintains or improves its competitive advantage.

Matković, Marić, Tumbas, and Đurković (2018) emphasize in their work that organizations are increasingly turning to the application of modern technologies to leverage their competitive advantages and be more successful in market competition compared to their competitors. The primary goal is to achieve better business results. In addition to products and business processes, digital technologies aim to improve sales channels and supply chains. They also believe that any new technological trends or new technologies that emerge will have a significant impact on the digital business transformation of organizations as they exist today. The mentioned authors also emphasize that any change provided by modern technologies cannot contribute to better business results without accompanying organizational changes. Organizational changes, together with numerous modern technologies, are the way to successful digital business transformation and thus guaranteed business success in today's conditions.

3. DIGITAL BUSINESS TRANSFORMATION

Given the constant advancement of technology and its increasing integration into people's lives and daily routines, organizations are increasingly opting for the adoption of modern technologies. The goal is to maintain a competitive advantage in the market and, above all, achieve the best possible business results. To fully leverage the benefits of digital business transformation, which will be discussed later, it is necessary to carry out a reorganization of business operations to replace existing business models with new, improved ones.

Digitization has led to a situation where IT strategies are no longer solely at the functional level. Rather, the alignment of IT strategy and business strategy is essential, resulting in a unified strategy referred to by experts in this field as digital business strategy. This strategy serves as the foundation for the transformation of modern organizations, as it allows for a more efficient utilization of human resources, assets, and technologies and the design of improved automated business processes (Matković, Marić, Tumbas & Đurković, 2018).

The digital economy, based on information and knowledge, cannot function without digital

technologies. The key to today's business lies in information, and not just any information but timely, accurate, and complete information.
The best direction for digital strategy depends on the strategic goals of the company, the industry to which it belongs, the pressures it faces from competition, and, of course, customer expectations. In industrial sectors dominated by physical products (such as mining, metal industry, woodworking, automotive industry, etc.), companies usually begin the digital transformation of their business operations with the aim of achieving higher product quality, reducing waste, and consequently reducing labor costs. In the service sector (finance, telecommunications, etc.), where many services are offered through mobile devices, the focus is on creating value for customers, providing numerous benefits. For example, users of mobile banking services can pay their bills from anywhere in the world, provided they have funds in their account and an internet connection, without physically going to the bank and making the payment. Any cost reduction in business processes automatically leads to higher profits, although this also has its negative effects, which will be discussed later in the section on the advantages and disadvantages of digital business transformation (Stefanović & Simić, 2020).
There are also companies in certain industrial sectors, such as insurance companies or oil processing companies, whose operations could still continue without the digital transformation of their businesses. However, even companies in such industrial sectors opt for the digitalization of their operations to modernize and optimize their business operations and processes. Their goal is to reduce transaction costs and increase flexibility (Stefanović & Simić, 2020).

In the process of digital business transformation, a company first needs to decide whether to develop digital products, digital business models, or both. Numerous studies have shown that all major companies primarily start with the digital transformation of their products and services, followed by the development of digital business models, which show how value is created for customers. After digitizing their offerings (products and services) and educating on digital business models, companies seek to develop their digital ecosystems. The success of a business model depends on its proper alignment with the business ecosystem in which it is applied, to further its development and advancement. The three main elements necessary for building a business ecosystem are: a digital platform, network effects, and market expectations. A digital platform is nothing but the technical infrastructure within which ecosystem participants integrate, and it serves as the main pillar of the business ecosystem, around which participants gather to provide products and services to customers. It is believed that without a digital platform, there is no business ecosystem (Stefanović & Simić, 2020).

As mentioned earlier, business models are redefined through digital business transformation. The new digital economy refers to new business models, products, services, and markets. Digitalization has abolished intermediation through digital services and products. All business transactions take place in a virtual environment, and traditional business is transformed by digital technologies to ensure competitiveness in the digital economy. Any inequality in access to technologies, information, and knowledge is defined as the digital divide. There are numerous reasons for the emergence of the digital divide, with poor economic conditions and the quality of education in society among the main factors. Access to digital technologies provides opportunities for economic growth and poverty reduction. The challenge of the digital economy is the inability to apply the internet in business due to poor infrastructure, a lack of skills, and high costs of equipment, networks, and software. Measures to narrow or, if possible, overcome the digital divide depend primarily on the type and causes of the digital divide. Since the digital divide is a specific phenomenon of the digital economy, it is almost impossible to completely overcome it, and attention must be focused on narrowing it (Krsmanović & Gavrilović, 2020).

3.1. TECHNOLOGIES ENABLING DIGITAL BUSINESS TRANSFORMATION

The development of Information and Communication Technologies (ICT) and the internet has enabled new ways of communication between people as well as between organizations and their stakeholders, such as suppliers, business partners, and customers. Further advancement in ICT has led to the emergence of electronic commerce and electronic business. Initially, information technologies supported existing business processes, but today, they are used for developing new products, services, and business models. Four fundamental technologies that have provided numerous opportunities for organizations to successfully execute the digital transformation of their businesses are (Matković, Marić, Tumbas & Đurković, 2018):

- Mobile technologies
- Cloud computing
- Big data
- Social media

- IoT technologies
- Artificial intelligence (AI).

The use of mobile technologies in business involves the utilization of all mobile devices, such as smartphones, tablets, and similar devices, as well as the applications located on these devices. Applications are typically directed towards customers, partners, suppliers, and employees, and the use of mobile technologies alone provides numerous benefits for organizational operations. For example, "Delta Air Lines" is one organization that has leveraged mobile technologies for innovations in its business. Around 19,000 flight attendants of this company possessed mobile devices, resulting in increased in-flight sales revenue. Mobile technologies have generated significant revenue for this company because the airline provided mobile devices embedded in seats, allowing passengers to book new airline tickets, book hotel accommodations, and utilize various other services during flights (Matković, Marić, Tumbas & Đurković, 2018).

Cloud computing, or cloud computing, represents the ability to use numerous IT and software solutions as service-based offerings. These services can be paid for on a monthly basis or based on the volume of services used. This type of technology enables organizations to achieve significant cost savings, both in terms of infrastructure costs and labor costs. Today, organizations must be more agile, flexible, and faster in meeting customer needs, and there are examples of numerous companies worldwide that could not meet all the needs of their customers until they transferred their databases to the cloud. This has provided them with many advantages in terms of data management optimization and data transmission, and the key to the functioning of the digital economy is relevant information, which must be available at the right time and in the right place. This is precisely achieved through these technologies (Matković, Marić, Tumbas & Đurković, 2018).

Big data, or big data technologies, refers to technologies that store huge amounts of diverse data that need to be processed quickly to make appropriate business decisions. These data can be both structured and unstructured, so conventional data processing cannot be efficiently conducted, jeopardizing business decision-making. Therefore, more and more business is conducted while considering the big data concept because it enables overcoming obstacles in analyzing large amounts of data (Matković, Marić, Tumbas & Đurković, 2018).

Social media technologies are intended to facilitate social interaction via mobile devices, which must be connected to the internet. Social media includes social networks, blogs, web conferences, and similar platforms. The increasing presence of people on social media makes it easier to reach existing customers and attract many new customers or service users for organizations. Many organizations today use social media to listen to and understand consumer attitudes towards their products, services, and overall business operations. In addition, organizations use social media for communication with their employees and customers to facilitate their use of products or services, and users leave their comments via social media, which are extremely valuable to the organization as a form of feedback related to their business (Matković, Marić, Tumbas & Đurković, 2018).

Additionally, one of the technologies that has been expanding in recent years is artificial intelligence, which represents nothing but the replacement of human intelligence by computers in many activities. There are many definitions of artificial intelligence, but a generalized one would be that artificial intelligence is the ability of computers or programs to mimic human behavior and act in accordance with human behavior, i.e., to mimic human intelligence and behavior. Regarding business digital transformation, artificial intelligence is increasingly recognized as a technology that can improve competitive advantage, innovation, and growth for organizations using this type of technology (Tovarloža, Perić & Đurkin Badurina, 2019).

Digital technologies, accompanied by organizational changes, contribute to improving overall business performance, making digital transformation truly essential for successful business operations in today's conditions.

3.2. THE IMPACT OF THE INTERNET OF THINGS TECHNOLOGY ON DIGITAL BUSINESS TRANSFORMATION

Today, the IoT concept is increasingly applied both in private and business settings. The IoT concept entails a large number of smart devices connected to the internet. These IoT devices automatically collect data and send it to a computer or mobile phone user or to a database, most commonly stored in the cloud today. IoT devices can be part of a fully automated system that reacts to given conditions without the need for human intervention. Of course, people can also initiate commands through applications on their mobile devices. For example, in a manufacturing plant, heating or cooling can be remotely activated via a mobile phone application one hour before arriving at work (if not automatically set), thereby avoiding unnecessary

heating or cooling when there are no employees present. This leads to significant cost savings. Furthermore, in case of any emergencies in the manufacturing plant, IoT devices would detect a problem in time and alert, thus minimizing damages in terms of human casualties and potential material losses. For instance, if smart smoke detectors are installed in the manufacturing plant, they could promptly react and extinguish a fire, or the system would react if fire sprinklers were installed in the organization (Ilić, Damjanović & Katanić, 2023).

IoT technology protects resources by preventing their excessive and unnecessary use. IoT technologies are also applied in households, turning traditional homes into "smart" homes. Smart devices are increasingly used in buildings and manufacturing plants, turning cities into smart cities that produce and consume more green energy. In homes, smart devices such as smart refrigerators, smart beds, smart light bulbs, smart locks, smart vacuum cleaners, smart pet feeders, and many other devices are becoming commonplace. The automation of production processes using IoT technologies has contributed to improving the quality of the products and services we use daily. This leads to increased productivity and reduced production costs, as well as precision and accuracy during product and service delivery. Additionally, IoT technologies provide easier and more convenient task execution and increase safety and security in both manufacturing plants and households, cities, and buildings. In their unique way, IoT technologies also contribute to environmental conservation by conserving scarce natural resources, optimizing their usage, and reducing waste generation (Ilić, Damjanović & Katanić, 2023).

Primarily, IoT technologies aim to provide the right information in the right place at the right time to better plan various activities to avoid production line interruptions. IoT systems can autonomously perform self-checks at certain intervals and identify components that could potentially fail, allowing for timely repairs or replacements. Unexpected downtime and prolonged servicing of breakdowns in manufacturing plants could be prevented, thus avoiding possible accidents in production facilities. All these activities extend the lifespan of equipment, increase workplace safety, and prevent the possibility of increased operational costs (Damjanović, 2017).

In the Swiss canton of Zug, in the city of the same name, there is the Siemens campus, which is part of their project to demonstrate how digital transformation using state-of-the-art technology drives a human-centered sustainable environment. The campus covers an area of 25,000 m2, with a total floor space, including all floors, of 81,000 m2. Of the total floor space, 13,000 m2 are used for production, 39,000 m2 are used as office space, and the total number of employees on this Siemens campus is 1,700. At the top of the campus are 3,500 solar modules, covering an area of 6,100 m2. The solar panels provide 1,300 MWh of electricity annually, accounting for 20% of the total electricity used by the campus annually. Additionally, the campus uses 2,100,000 m3 of water from the lake for cooling and heating purposes. The water maintains a certain temperature even in winter and only needs to be heated by a few degrees, resulting in significant savings compared to heating costs using gas or other energy sources. Switzerland is seeking to reduce pollution in various ways, and by using water from the lake, which is a natural resource, heating is ecologically the cleanest using this system because no harmful gases are released into the atmosphere as a result of burning fossil fuels, as was the case earlier during winter periods. On the campus roof, there are 7,800 m2 of greenery to optimally utilize the space occupied by the campus and provide oxygen production through the process of photosynthesis. By not using fossil fuels, around 195 tons of CO2 emissions are avoided annually (Siemens Campus Zug, Switzerland).

Some smart buildings even use rainwater as technical water by collecting it, storing it in concrete basins, and using it for toilet flushing, floor washing, or cleaning concrete surfaces around the building. In this way, a considerable amount of drinking water is saved because it is not used unnecessarily for these purposes. An example of such a smart building is Edge in Amsterdam, where employees do not have fixed workstations but are assigned them upon arrival at work. The entire building is made of glass to use natural light to illuminate the interior of the building throughout the day and reduce the use of artificial light and, consequently, electricity costs to a large extent (Randall, 2015).

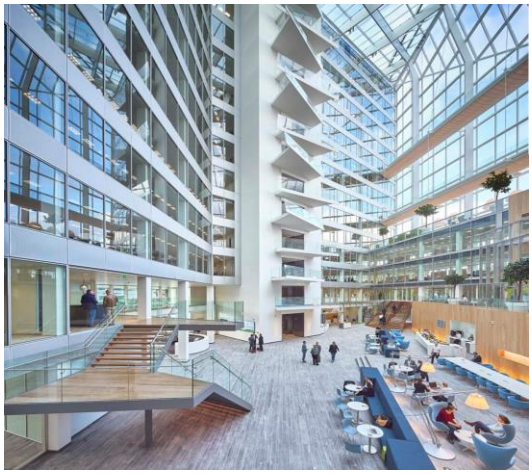

Image 1. Edge smart building in Amsterdam
Source: **https://edge.tech/developments/the-edge**

Employees in this building start their workday by using an application on their mobile phones. Through the application, employees receive their schedules, and upon arrival at work, cameras detect employees' cars and guide them to their designated parking spots. Depending on their schedule, employees are assigned their workspace because, as mentioned earlier, they do not have their own offices. This approach aims to facilitate communication among all employees by ensuring that they do not sit with the same colleague every day. Edge possesses 28,000 sensors that detect numerous changes within the building and adjust the environment accordingly. For example, when visibility decreases in the building, LED lights are activated to illuminate the space, but only in the part of the building where employees are located. The smart mobile phone of the employee is, so to speak, the "passport" for the Edge smart building. Through it, employees receive all information more quickly and efficiently, including turning heating on or off via a smart thermostat and controlling numerous other IoT devices within the smart building. The south wall of this smart building is covered with solar panels, and thanks to solar energy, the building consumes 70% less electrical energy (Randall, 2015).

From the examples provided, it is evident how much digital transformation has contributed to energy savings, natural resource conservation, and improved environmental awareness and responsibility among companies that have embraced and implemented it in their operations. Technologies are certainly there to make everyday life easier, whether used in private or business life, and the examples mentioned highlight the numerous advantages they bring.
The use of IoT technologies in business, based on sensors and actuators, enables data collection, which is analyzed to make numerous decisions. As buildings using IoT devices become smart, so do factories that utilize IoT devices in their operations and become smart factories. Within smart factories, all data about human, physical, and operational assets is integrated into a unified whole to initiate maintenance, production, digitization, and various other activities in manufacturing plants. All production facilities use data and information from different components thanks to sensors to achieve predictive maintenance in the sense that machines assess their work and detect potential failures. Connectivity, achieved in factories as a result of using IoT devices, represents the most significant source of value. All collected data via IoT devices reflects the current state, and based on the gathered data, insight into the entire supply chain can be obtained, thus improving its efficiency. Business process automation within factories enables more efficient resource utilization, improved production, enhanced quality and precision, reduced costs in terms of utilities, and the generation of large amounts of waste. RFID technologies are also of great importance for the use of IoT devices, enabling automatic identification of numerous tools used in factories. By using IoT technologies in business, product delivery times to consumers are reduced, and productivity is improved. The technologies most commonly used to transport collected data from the environment via IoT devices to the cloud are usually WiFi and Bluetooth due to their speed, reliability, and security. Worker safety in manufacturing plants where IoT devices are used is increased because workers can carry portable devices with them, through which they can receive emergency information in the form of potential hazards that may occur in the production facility (Kalsoom, Ahmed, Muhammad Rafi-ul-Shan, Azmat, Akhtar, Pervez, Imran, Ur-Rehman, 2021). Companies recognizing all the benefits of IoT technologies achieved by their application in business are increasingly investing in these technologies with the aim of survival to successfully withstand challenges in conditions such as those today.

4. ADVANTAGES AND DISADVANTAGES OF DIGITAL BUSINESS TRANSFORMATION

Digital technologies bring numerous advantages both to individuals in their private lives and to businesses in their professional endeavors. Organizations reap many benefits from the digital transformation of their operations, and as mentioned earlier, companies operating in today's market conditions would not be successful

without the use of digital technologies in their operations.

Digital business transformation offers numerous conveniences for both organizations and the customers or users of their products and services. By leveraging various technologies that facilitate digital business transformation, the advantages include (Matković, Marić, Tumbas & Đurković, 2018):

- Accessibility to corporate applications and data from anywhere on the globe.
- Increased employee productivity.
- Enhanced collaboration among employees.
- Flexible data storage capacities.
- Increased business agility.
- Faster insights into organizational data.
- Provision of vast amounts of data from various sources for more effective decision-making.
- Reduction of fixed costs for the organization.
- Improvement of customer communication.
- Enhancement of service delivery to customers.

Since organizations also have a presence in the digital marketplace, customers can always access the organization's website and view its offerings. Through the website, they can obtain various information about product usage and services and provide feedback via comments, which is crucial for the organization's further business operations and potential modification of its business strategy. A successful digital business transformation streamlines employees' daily activities, ensures a reduction in waste during the production process, and increases employee productivity. Additionally, all employees, thanks to digital technologies, are interconnected and can exchange information more quickly and easily, which is essential for their business operations. Considering that information is the "fuel" of the digital economy, and the digital economy is characterized by an abundance of information, flexible data storage capacities are vital for storing enormous amounts of information, whether collected via IoT devices or based on written documents. Thanks to digital technologies, the organization's agility has increased, allowing it to respond quickly and efficiently to changes, whether they occur in the organization's internal or external environment. With digital technologies, quick and straightforward access to data essential for business decision-making can be achieved through queries to the database. The goal of every business entity is to minimize costs to the lowest possible levels because total costs, together with total revenues, generate the company's profit. Digital business transformation ensures cost reduction and an increase in the company's profit. The goal of every organization is to retain existing customers, understand their expectations, needs, and desires through marketing research, and meet their demands to maintain their loyalty. Digital business transformation enhances communication with existing customers and opens doors to potential customers by continually striving to improve the customer experience.

In addition to the advantages, there are also certain disadvantages of digital business transformation that people encounter when it comes to using digital technologies. Many people develop animosity when they encounter anything new and previously unknown, requiring certain mechanisms to motivate or, in some cases, compel them to use modern technologies. By using them over time, most people find that it is not particularly difficult, and they quickly adapt to new technologies.

As for the disadvantages of digital business transformation, some of the most significant ones include:

- Insufficient skills of employees to use digital technologies.
- Risk of unauthorized access to organizational resources.
- High costs of providing digital technologies.
- High maintenance costs of digital technologies.
- Dehumanization of business.

A significant problem is the lack of skills among employees in the organization who should use the new technologies introduced into business processes as a result of digital business transformation. Therefore, organizations often need to organize training for their employees and allocate financial resources for employees to acquire the necessary skills. There is another problem in this situation, and that is the possibility of employees leaving the organization after completing the training and gaining additional skills, which would effectively be a loss for the organization as they must find new employees and send them to training for the use of new technologies. Since today's society is a so-called "information society" that uses digital technologies, there are significant risks that all the necessary information for business will come into the possession of unauthorized persons. If the information of an organization, which has a competitive advantage in the market, falls into the hands of competitors, it could signal the end of the organization's business strategy affected by the

intrusion into its information system. Therefore, it is necessary to take precautionary measures to take all steps to protect information, as a crucial resource of the organization's business, in the best possible way. Digital technologies that facilitate the digital transformation of an organization's business are often expensive and cost-effective in the long run. However, at the time of their introduction into the organization's business processes, it is necessary to set aside a considerable amount of money to procure the necessary technologies. Also, in case of malfunction or any damage to production facilities, it is necessary to provide experts who can rectify faults or damages to devices used in the organization. Whether the company will opt to hire experts as their employees or outsource such services depends on the company's management. If any of the employees were responsible for maintaining these technologies, in case of malfunction, every delay could be rectified faster to avoid disruptions to the production process. In the case of outsourcing technology maintenance services, it would take some time for one of those responsible for maintenance to come, identify the fault, and rectify it. In terms of costs, it is more cost-effective to periodically outsource technology maintenance services in the organization than to have an employee as an additional cost in the organization, but as mentioned earlier, although it would be an additional cost, the difference is reflected in the speed of rectifying faults. As a significant challenge of digital business transformation, dehumanization of business is mentioned, or the decreasing number of workers in organizations, because with the introduction of digital technologies, the need for a large number of workers decreases as a result of the automation of business processes. This is an advantage for the organization as it reduces costs in terms of financial allocations for salaries, taxes, and contributions, which are the employer's obligations for each of his employees. On the other hand, this is a problem for employees because they remain jobless at the given moment. Artificial intelligence, as a new technology under development, threatens to completely remove a large number of occupations "from the scene." Be that as it may, no matter how much people oppose and harbor animosity toward digital technologies, it would be good to understand that every technological development aims to make human everyday life easier, whether it is in private or business life. IoT devices are relatively inexpensive technology today that is increasingly used for business purposes and enables significant business transformation. The use of these devices increases security in all phases of the production process, as it reduces the human factor's impact and its reaction in critical situations. This also leads to significant economic savings because manual labor is significantly reduced, along with the need for some jobs, which are now completely replaced by IoT devices. Also, the disappearance of a large number of jobs as a result of the introduction and development of technology also results in the creation of a huge number of new jobs in terms of maintenance, management, and implementation of new technologies.

CONCLUSION

The development of technology is an ongoing process, and it is believed that there will never be a moment when we can confidently say that the development of technology has reached its peak. In the future, there will be more and more new technologies that will make human everyday life easier, both in private and business life.

Digital business transformation is essential for every organization that wants to exist and operate in today's market. Implementing new technologies is usually a process that requires significant amounts of money to acquire them, but looking at the long term, this investment is indeed profitable.

Carrying with them all the advantages and disadvantages, it can be concluded that digital technologies are an indispensable part of human daily life. The most successful companies have recognized digital business transformation, and by introducing digital technologies, they have improved their business processes, built new business models, and provided savings in terms of costs and workforce. Although a large number of workers are left without jobs due to the introduction of digital technologies into business processes, it is believed that the emergence of new digital technologies will lead to the appearance of a spectrum of new occupations that these workers could engage in in the future. Technologies are here to make human daily life easier, not harder, but it is necessary to use them with caution to protect all information, which is the key to business in today's economy.

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Review Article

THE IMPACT OF SANCTIONS ON RUSSIAN-KAZAKH COOPERATION

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Abstract*: The purpose of the article is to analyze the balance of benefits and risks in cooperation between Russian and Kazakh companies under sanctions pressure, to determine the consequences of a decrease in the activity of interstate relations and to assess the prospects for cross-border cooperation between countries.*
Method - in order to identify the factors of influence of sanctions on economic cooperation between Russia and Kazakhstan, the method of excluded alternative is used, which assumes that the influence of sanctions is less pronounced, the less pronounced a possible alternative to the sanctioned action is.
The hypothesis of the study is the assumption that, despite the threat of secondary sanctions, it is beneficial for the Republic of Kazakhstan to maintain the existing system of cooperative ties between Russian and Kazakh enterprises.
Result. A set of factors has been identified that indicate the high stability of the structure of economic relations between Russia and Kazakhstan to Western sanctions
Conclusion. The study provides for the formation of a long-term monitoring model for assessing socio-economic relations between countries, one of which is under the influence of sanctions.

Key words: *sanctions, Russian-Kazakh relations, cross-border cooperation, foreign trade turnover, transport corridor*

JEL classification: *P33, F51, F15*

1. INTRODUCTION

The Republic of Kazakhstan is of great geopolitical importance for Russia. A significant amount of cargo, which is extremely in demand by both countries, is sent through the republic. The announcement of sanctions against Russia by Western countries has an undoubted impact on the nature of socio-economic relations between the Russian Federation and the Republic of Kazakhstan, despite the deep internal connection that has formed between enterprises of both countries over a period of their independence. At the moment, at least a quarter of Russian exports and imports are subject to direct sanctions-related bans, and the total number of sanctions has reached about 11 thousand. (Shegirbayev, 2023). The Kazakh company Elem Group is already included in the 13th package of EU sanctions in 2024. In addition, the DA Group company was included in the list of sanctions published by the United States "in connection with two years of Russia's attack on Ukraine and the death of Navalny." In these conditions, it is important to balance all possible risks associated with the prospects for the development of Russian-Kazakh cooperation, since it is Kazakhstan that accounts for a significant part of the Russian state border and through which most of the export-import flows are directed.

Research shows that the impact of sanctions on different countries can cause the most unexpected consequences. In one case, sanction intentions may not achieve the desired results and harm the initiators of sanctions (Smeets, M. 2018), but, on the other hand, negative results for the sanction target may be caused not so much by sanctions as by the threat of their announcement (Kaempfer, 2007). Therefore, despite the obvious connection, the processes that generate sanctions and the processes that determine their outcome cause different consequences.
The reason for this discrepancy is that the subjects involved in the sanctions war are not always able to comply with sanctions restrictions, since this contradicts their interests and threatens to destroy the economic system that has been formed over many years. The Russia-Kazakhstan border is almost totally a land border, except for 1,516.7 km of the river border, 60 km of the lake border, and 85,8 km of the border that goes across the sea.

2. DEVELOPMENT OF CROSS-BORDER COOPERATION BETWEEN RUSSIA UND KAZAKHSTAN

Until 1990, the territories of modern Russia and Kazakhstan developed as a single economic complex. A significant part of the territory of the Kazakh SSR, especially its northern side, was poorly developed and required a large investment of labor and capital for its development. With the acquisition of independence, Kazakhstan was faced with the need to form a holistic and balanced national economic system, providing for active cooperation with neighboring countries. Thus, at least 4 stages can be distinguished in the development of cross-border cooperation between the two states.

1.Since the beginning of the 90s. border infrastructure is being formed, checkpoints are being built and the procedure for crossing the state border is being determined.

2.The stage is associated with the establishment of the EurAsEC; after the ratification of the agreement with all member states in 2001, the stage of integration of the economic systems of the participating countries into the common economic space begins. At this stage, a noticeable impetus was given to trade and economic relations between Russia and Kazakhstan, which became the basis for the inclusion of other participating countries. During this period, the activity of interaction between countries in an intermunicipal format increases, joint cultural events are organized, and cross-border trade intensifies.

3.However, the introduction of covid restrictions in the early 20s. slowed down cooperation between countries, limiting the mobility of business and humanitarian contacts between them, which contributed to the transfer of relations exclusively to the level of interstate cooperation. This third stage soon develops, against the backdrop of Russia's a special military operation (SMO), into the suspension of all intermunicipal events and the curtailment of business cooperation between entrepreneurs in border areas.

4. Since the beginning of the SMO, the dynamics of trade exchanges between Russia and Kazakhstan have not undergone significant changes. However, the share of Russia in the structure of foreign trade relations of the Republic of Kazakhstan gradually decreased as the dynamics of trade relations of the Republic of Kazakhstan with other countries increased - from 24.2% in 2021 to 19.4% in 2022. For this period, Russia ranked third among the largest investors in Kazakhstan (Dodonov, 2023).

The introduction of sanctions against Russia in 2023 had a significant impact on the dynamics of trade relations between the countries. Fearing secondary sanctions for the supply of products and technologies through parallel imports, the leadership of Kazakhstan began to gradually revise previously concluded contracts with the Russian side. However, the country's economic leadership was not ready to completely submit to the dictates of the imposed sanctions. The country is faced with a number of problems that require Russia's active participation and in-depth development of interstate relations.

The introduction of sanctions by Western countries contributed to a significant reduction in imports of equipment and technology from Europe and the USA. And this forced Russia to intensify cooperation with the countries of Asia and the Middle East. As a result of this circumstance, a change in the vector of trade flows contributes to an increase in the cost of logistics and a revision of the structure of incoming imported products. However,research shows, that multilateral sanctions did not divert the trade flows from Western countries, the existence of sanction busting activities against Russian unilateral counter-sanctions, confirming the hypothesis that unilateral sanctions are ineffective and allow for third-country effects. (Aituar, 2021).

The experience of sanctions policy in previous years shows that economic sanctions achieve their goals in less than a third of the cases when they are introduced. (Early, 2015). In the case of Russia, it should be borne in mind that the country has a powerful resource potential that is capable of compensating for trade flows subject to sanctions. The economy of Kazakhstan has historically been integrated into the economic system of the former Union, being one of its constituent parts.

However, the introduction of sanctions against Russia in 2023 had a significant impact on the dynamics of trade relations between the countries. Fearing secondary sanctions for the supply of products and technologies through parallel imports, the leadership of Kazakhstan began to gradually revise previously concluded contracts with the Russian side. However, the country's economic leadership was not ready to completely submit to the dictates of the imposed sanctions. The country is faced with a number of problems that require Russia's active participation and in-depth development of interstate relations.

3. ASSESMENT OF THE IMPACT OF SANCTIONS ON ECONOMIC COOPERATION BETWEEN RUSSIA UND KAZAKHSTAN

Assessing the impact of sanctions on a country's economic development is best done using the eliminated alternative method. The theoretical meaning of this method is that the influence of sanctions is less pronounced, the less visible a possible alternative to the sanctioned action is. The purpose of the method is to identify special parameters of the socio-economic situation of interacting countries according to their influence on the country of the counterparty. The degree of such influence can be determined by the nature of the exclusivity of the resource that is the subject of interstate exchange. Sanctions are designed to limit the possibility of such an exchange by specifically causing damage to one of the parties to such an exchange.

An analysis of the practice of interstate cooperation between countries during the sanctions period shows that the Kazakh side is most interested in using Russia's logistics infrastructure to supply its export products to European markets, oil and gas engineering products, in the creation of components and spare parts for machinery and equipment, as well as in the production of containers for transportation of goods. Over 90% of Kazakh oil exports are delivered through the territory of Russia, transported through the Caspian Pipeline Consortium (Tengiz - Astrakhan - Novorossiysk, CPC) and the Atyrau - Samara oil pipeline, as well as by rail. The throughput capacity of the CPC is 67 million tons per year (with the prospect of increasing to 80 million tons by 2024), and the capacity of the Atyrau-Samara oil pipeline reaches 15–18 million tons per year. (Pylin, 2022a). However, this transport corridor, used for transporting products from China to Europe through Russian territory, has a real alternative in the form of the Trans-Caspian International Transport Route. The EU countries are interested in the development of this route, as well as China, Azerbaijan and Georgia, which, through this project, can improve the state of their transport infrastructure, create jobs on their territory and diversify transport flows to European markets. But the implementation of this project seems too expensive today, since it is associated with significant costs for information services for the route, the development of ports on the Caspian Sea, and administrative costs associated with crossing borders. Consequently, the cost of this option is many times higher than that of the CPC, making it more of a political instrument.

Many enterprises of the Republic of Kazakhstan not only have markets for their products in Russia, but also receive a significant part of their raw materials and components from Russian enterprises. The share of Russian companies in reforming the Kazakh electricity sector is significant, and Russian gas is widely used for gasification of the northern and eastern regions of the country. For environmental reasons, international banks refuse to finance coal-fired generation, which forces the Kazakh side to turn to Russia for help when reconstructing local heating plants. From 2019 to 2023, the number of Russian enterprises in the Republic of Kazakhstan increased from 6.5 thousand to 18 thousand units. At the moment, the number of enterprises with Russian capital is already 45% among enterprises with foreign capital, whereas in 2019 there were only a third.

A special feature of the economy of Kazakhstan is its industrial nature (40% of GDP), which makes it insensitive to sharp fluctuations in market conditions. This can explain the relatively low return on the influx of Russian relocants in 2022. The service economies of Georgia and Armenia received significantly more income from the influx of Russian relocants. (Petrocouncil, 2023)
The industries of Kazakhstan itself are also suffering from the Western sanctions policy towards third countries, especially the export-oriented metallurgical and mining industries. (Bozhko, 2022). Since Russia is the main market for industrial products of Kazakhstan, finding an alternative for it seems to be an extremely difficult task.

One of the actual problems of modern Kazakhstan is also the shortage of water resources, since most of the country is located in an arid zone. Solving this problem is impossible without the participation of Russia, which has significant water resources and technologies for regulating the water balance. (Dzhusupova, Bagytkalieva, Nurlybai, Raeva, 2019).

Another important problem of the republic is the noticeable lag of the northern regions adjacent to the borders with Russia. This lag is confirmed by both economic indicators and demographic trends. So, if in one of the large regions of Northern Kazakhstan, the North Kazakhstan region (oblast), there were 592 thousand people in 2010, then in 2020 there are only 548 thousand people. The low population density in the border regions of Northern Kazakhstan does not allow for an active economic policy to be pursued here. Cross-border cooperation between the Russian Federation and the Republic of Kazakhstan in the territory

adjacent to Northern Kazakhstan, where most of the Russian-speaking population of the republic lives, could contribute to the development of this depressed territory.

The situation seems more favorable for the western part of the country (Atyrau region), where the oil production industry is developing and does not show any dependence on the supply of equipment from its northern neighbor. However, in recent years, a record number of Russian enterprises have been registered in the region, and cooperation between one of the most developed regions of the Republic of Kazakhstan and the Astrakhan region is expanding.

In general, restrictions in the development of interstate relations can be removed to a certain extent as interregional relations develop. Agreements concluded between the regions of the two countries allow timely and flexible decisions to be made that benefit companies operating in these regions. In addition, at the regional level, the impact of sanctions is less noticeable. Subjects of the Russian Federation, within the framework of their powers, actively promote their products to the markets of the Republic of Kazakhstan, building mutually beneficial cooperation with the neighboring country. Thus, for the Omsk region, Altai Territory and a number of other border regions, the volume of foreign trade turnover with Kazakhstan is at least 20% of the total volume. (Pylin, 2022b)

According to the Kazakh Center for Statistics of Foreign, Mutual Trade and Commodity Markets, trade turnover between Russia and Kazakhstan in 2023 amounted to almost $26 billion, which is commensurate with 18.6% of its volume. Exports to Russia amounted to $9.8 billion (12.4% of total exports) and $16 billion of imports (26.5%) of its total volume. The Russian Federation, even under sanctions pressure, continues to occupy a huge share of the foreign trade turnover of the Republic of Kazakhstan: with the countries of the EAEU its size is 91.1%, followed by the Kyrgyz Republic - 5.5%, the Republic of Belarus - 3.2% and the Republic of Armenia - 0. 2%. Russia also leads as a supplier of imported products to the republic, ranking second after China. Russia's share in Kazakh exports is slightly lower: Italy (18.9%), China (18.7%), Russia (12.4%), the Netherlands (5.2%), Turkey (5%), Republic of Korea (4 ,8%). The structure of Kazakhstan's exports to Russia is dominated by food products (42.4%), mineral products (20.4%) and chemical products (16.6%), machinery and equipment, and Kazakhstan's imports from Russia consist mainly of food products , mineral products, chemical products and wood. (Bureau of national statistics, 2023) Thus, using the excluded alternative method, it is possible to identify several parameters for comparing the social and economic indicators of two countries, and also to assess the stability of interstate economic relations between Russia and Kazakhstan to the influence of anti-Russian sanctions using the selected parameters (Table 1). The selection of parameters is carried out on the basis of a comparison of a number of social and economic indicators of the compared states, considered from the perspective of taking into account the interests of states in establishing a coordinated policy. The selected parameters allow us to consider the position of the border country relative to its counterparty from the point of view of the participation of this counterparty in the development of this country, its receptivity to the participation of the counterparty in establishing mutually beneficial ties. The degree of intensity of such participation and the exclusivity of resources demanded by the counterparty country determine the depth of interstate cooperation and the significance of sanctions pressure on the possibility of such cooperation.

Table 1.
Comparative analysis of the parameters of social and economic connectivity in the development of Russia and Kazakhstan

Comparison parameters	Russia	Kazakhstan
Investments in the counterparty country	$19 billion	$5.6 billion
The number of companies in the neighboring country	18 thousand.	no information
Import demand	Steel, ore, uranium	Energy, mineral fertilizers, railcars
Export volumes to the counterparty country (2023)	$16 billion.	$9.8 billion
Number of Kazakh/Russian population in the counterparty country/percentage of total number	591 970/0,4%	3000 611 /15,8%

Compiled: according to the Bureau of Statistics of the Republic of Kazakhstan and Rosstat

The selection of parameters is determined by the degree of distribution of a number of socio-economic factors of the country's development in the space of the counterparty country from the point of view of the influence of this factor on this development. By building long-term and sustainable relationships with each other, neighboring countries exchange goods, services and technologies, selecting the most effective method of such exchange. The effectiveness of an

exchange is determined by the maximum benefit that each such exchange provides to the parties. This benefit is assessed by each party in relation to possible alternatives in achieving the goals underlying such an exchange. These factors can be divided into three groups:

1. Foreign economic – factors that determine the nature of export-import interaction between neighboring countries, the degree of their economic dependence on each other.
2. Investment - factors that are formed on the basis of the placement of capital of entrepreneurs from one country on the territory of another country. Investments in the economy of a neighboring country, like nothing else, makes the business communities of neighboring countries feel interested in the development of these countries.
3. Ethnic-national factors, which are determined by the concentration of the population representing the titular nationality of the neighboring state in the counterparty country. The significance of this factor is due to the common values and interests of residents of neighboring states, their readiness to expand socio-economic cooperation between countries, and interest in the development of humanitarian contracts.

All these groups of factors lay down certain institutional restrictions on the actions of political leaders of states in determining the strategic directions of state economic policy. The changes occurring under the influence of these factors form stable preconditions for excluding alternative options in the development of the country in order to neutralize the threats of destruction of the existing socio-economic model.

The parameters presented for each of the countries being compared are evidence of their deep internal social and economic integration with each other, which makes it difficult to use alternative methods of replacing the existing structure of interstate relations.

The excluded alternative method involves identifying basic structural relationships in the list of presented parameters, which contain the majority of the semantic scope of these relationships. Thus, in the ratio of national communities of the Russian-Kazakh border region, representatives of titular nationalities make up the overwhelming majority of local national communities, excluding the emergence of other large diasporas here. And in establishing export-import flows, their main share is distributed between the countries adjacent to this area.
For example, with those presented in table. 1, in terms of the structure of export-import operations, the advantage goes to the country that has a product that has no analogues in the counterparty country. Therefore, Kazakhstan is an indispensable partner for Russia, through whose territory a significant part of imported products enters the country, including sanctioned. In addition, Kazakhstan is valuable for the Russian economy because it consumes relatively large volumes of non-raw materials produced in Russia. On the other hand, the economy of the Republic of Kazakhstan cannot develop without cooperation with the Russian Federation, which is confirmed by the expanding participation of Russian companies in the economy of Kazakhstan, as well as significant volumes of raw materials and equipment sent to Kazakh enterprises.

4. CONCLUSION

The analysis of the state of Russian-Kazakh economic cooperation carried out in the article indicates serious limitations associated with the effect of Western secondary sanctions on countries in contact with Russia. These countries, that have extensive relations with Western countries do not want to expose themselves to danger and officially demonstrate their readiness to support the regime of sanctions of Western countries against Russia, refusing to introduce their own direct sanctions. However, the relations between business structures of Russia and Kazakhstan that have developed over many years are an important factor in countering the sanctions policies of third countries. The regions of both countries are active promoters of mutually beneficial economic cooperation, establishing stable ties that provide conditions for the full development of these regions. Administering the sanctions regime in this case becomes a complex task, and this contributes to the expansion and strengthening of economic cooperation between countries.

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GREEN TRANSITION IN SERBIA

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Abstract*: The main aim of this study is to highlight the main challenges of green transition in Serbia. The key challenges were achieving energy efficiency, and production of clean energy. Although, the majority of study in the field have been explored developed countries, there is growing interest of researchers in an issue of renewable energy in developing economies. Legal framework has been analyzed. The results showed the great potentials of Serbia in renewable energy resources, as well as pointed to significant challenges in wider exploration. Regional collaboration named WB6 can be framework for faster sustainable development of all Western Balkan countries.*

Key words*: green transition, renewable energy, scenario planning, Western Balkans, Serbia*

JEL classification: *Q01, Q20, Q47*

1. INTRODUCTION

In this paper, the authors will analyzed the challenges of green transition in Serbia. Serbia is chosen for three main reasons. First, Serbia has high energy intensities compared to European Union countries. Second, there are great renewable sources in Serbia. Third, the current state of the energy sector can be described as transitional in two ways. One way is change of economy, and the other is green transition i.e. the reduction of CO2 emission.

Hovever, the main goal is efficiency in energy sector in Serbia. In the process of the green transition, the main investors are: „Green for Growth Fund, Regional Energy Efficiency Programme, European Bank for Reconstruction and Development, European Investment Bank, and World Bank Group“. Along with the important role of China, Turkey and Russia at the energy market.

To achive sustainable development, the main goal will be racional consumption of primary energy sources i.e. energy saving. According to European Commission (2020), the greatest potential is wind. Moreover, it is necessary to invest in hydro power, as well. The production of renewable energy has numerous benefits for citizens, but some disadvantages is also present. In this study, the authors will pointed to both benefits and costs of green transition in Serbia.

The experiences of EU countries in domain of renewable sources showed the following main obstacles: lack of expert knowledge, planning process of explatation would slow down that will result in high costs.

This paper is structured as follows. Next section is devoted to research context. Serbia is a case in point. Therefore, the section the analysis of renewable energy potentials, and Serbian strategies will be presented. To achieve vision “Serbia 2030”, two alternative scenario are possible. The final part is devoted to conclusions.

2. REVIEW OF PAST STUDIES

The Sustainable development is a vision for all European Union countries. This can be realized throught reduction of CO2 emission, and increase financing of the energy efficiency projects. The majority of citizents and companies have to change their ways in energy consumption and other life values. In this transition there are three main challenges such as financial and economic obstacles, knowledge and information obstacles, and institutional and organizational obstacles(Resch et al., 2017).

The aforementioned obstacles can be overcame by the community-based activities in which various

groups jointly act in production of renewable energy (Soeiro & Dias, 2020). In EU countries numerous studies have been focused this important subject (Walker & Devine-Wright, 2008; Yamamoto, 2016; Carlisle et al., 2009; Cejka et al., 2020; Denis & Parker, 2009; Kim et al., 2019; Carlisle et al.,2008; Young & Brans, 2017; McCabe et al., 2018; Bhattacharjee & Nandi, 2021). The aim main of these studies has been to identify main challenges in the particular countries, and to suggest the measures for policy-makers.

3. RESEARCH CONTEXT

Serbia is one of the Western Balkan countries. Sustainable strategy can be elaborated through two main perspectives. The first perspective includes legislative harmonization with the European Union laws. For instance, the goal is to increase renewable energy consumption. Joint strategy will be formalized by European Commission and Serbian Government.

The second way is regional cooperation of Western Balkan countries called Energy Community – Western Balkans 6 initiative also known as Berlin process. Since 2014, the annual meeting have been realized in Europen cities to implement the Green Agenda in Western Balkans. In 2019 "Statement on Clean Energy Transition in the Western Balkans" had been signed in Podgorica.

In 2020, the Green Agenda for Western Balkans had been signed. It comprised the main five pillars namely (European Commission, 2020):

1. „Climate, energy, mobility;
2. Circular economy;
3. De-pollution;
4. Sustainable agriculture and food production, and
5. Biodiversity".

To foster sustainable development in Western Balkan countries, since 2020 annual plans had been developed. The main suggestions from World Bank (2021) were: new and different investments in infrastructure, green products, and the significant potentials for green opportunities.

4. RESEARCH RESULTS

The results will be present into four following subsections: Energy balance in Serbia, Key renewable resources, Scenario planning, and sustainable growth throught regional cooperation.

4. 1. ENERGY BALANCE IN SERBIA

The results of the OECD and International Energy Agency (2008) revealed the followed facts about the energy sector in Serbia:

- Lignite was the vital resource for energy production, as Serbia's largest primary energy source,
- Followed by crude oil and oil products,
- Natural gas was third ranked energy resource,
- Electricity production was inefficient,
- State ownership and regulation of energy price -low prices,
- Lack of appropriate statistics,
- So called energy poverty, and
- Devastion of the forest along with the pollution.

Moreover, the following actions have been proposed to Serbian Government in domain of sustainable development (OECD/IEA, 2008):

- Creation a strategy of renewable energy production;
- Identification of place where this energy can be used;
- Financial support to plants that produce equipment;
- National plan for sanation of devasted areas;
- Penalty for illegal logging and
- Harmonization of statistical methodology with EU regulative.

It is important to note that statistics of renewables and waste, according to International Energy Agency (2021) composes of the followed categories: „electricity generation from biofluels, heat generation from renewable, hydroelectric, renewable share in final energy consumption, solar electricity generation, and wind electricity generation".

4. 2. KEY RENEWABLE RESOURCES

The latest data of renewables in Serbia is presented (IRENA, 2023). Renewable share in Total energy supply was 13% in 2015, raised on 17% in 2020. The structure of renewables in Serbia in 2022 was as followed (IRENA, 2023):

- 1% Bioenergy,
- 81% Hydroenergy,
- 13% Wind,
- 4% Solar energy, and
- 0% Geothermal energy.

This structure has been significantly different in 2020 when the main renewable was bioenergy (IRENA, 2023).

In 2022 net capacity change in MW was:

+472 Non-renewable

+85 Solar

+12 Hydro, and

0% Bioenergy/Wind/Geothermal energy.

Serbia has great potentials for renewable generation, expecially solar and wind potentials. According to IRENA (2020) forecasts, economic potential in 2030 of wind is 1,796 MW, and technical potential is 29,670 MW.

4.3. SCENARIO PLANNING

If meta-data from relevant sources such as EUROSTAT, International Energy Agency, and International Renewable Energy Agency combined with scenario planning the results will be interesting *(See Table 1).* One of the proposition is that renewable energy share is 27%.

Table 1. Forecasting Serbian sustainable development

Indicators	Scenario 1	Scenario 2
%renewable energy	36.8	39
GDP growth in %	3.5	/
Flat rate component	2.3	12
Potential component	2.0	/
Inter-connector	2.1	/

Source: Eurostat (2021), IEA (2021), IRENA (2020)

Regional cooperation can faciliate the green transition in Serbia.

4. 4. SUSTAINABLE GROWTH THOUGHT REGIONAL COOPERATION

In the past 17 years, researchers devoted significant focus on sustainable development of Western Balkan coutries (Dunjic et al., 2016; Schneider et al., 2007; Lalic et al., 2011; Topalovic et al., 2021; Ralchev, 2012; Pavicevic et al., 2020; Karakosta et al., 2012; Golusin et al., 2013; Papapostolou et al., 2017).

Since 2014, when initiative idea to foster sustainable growth thought regional cooperation, formaluzed in „Contract entitled Western Balkan 6 Initiative". The main goal of European Commission was to help and assist Western Balkans Governments in creation of regional energy market. Since 2015, the progress has been annualy monitored.

Until 2030 the main objectives are (Resch et al., 2019):

- To improve methodology and statistics in Western Balkans;
- The raise of renewable energy source in energy balance in whole region;
- To reduce CO2 emission in Western Balkans countries.

The newest data about energy mix in the Western Balkan countries are presented in Table 2.

Table 2. Energy consuption by source in Western Balkan countries

Country	Coal	Oil and oil products	Natural gas	Renewable enrgy	Other
Albania	2598.407	13419.953	404.93	11858.142	
B&H	49195.803	19668.886	2315.007	20399.295	
Montenegro	4192.993	4533.523	0	4008.589	
North Macedonia	9743.03	11555.9	2428.743	4262.807	
Serbia	87794.086	44381.589	24793.795	23490.923	

Source: Eurostat (2021)

All Western Balkans are similar regarding cost of renewable production. But, they are disparences in renewables by each country in the region.However, significant differences have been in resource availability at country level. Regional integration of renewable energy market will facilitate sustainable development. The main obstacles can be identified as followed (Resch et al., 2017):

- Political barriers that are manifested in political mission regarding sustainable development and energy efficiency,
- Legal barriers that comprised lack of laws, institional obstacles, contacts,
- Economic barriers high investment risk, small market, unpredictive condition and unexpected changes.

CONCLUSION

Green transition is a pathway for Serbia in achieving sustainable development. Decarbonization and clean energy production can foster an economic development.

Results of this study revailed two possible strategies in green transition process. The fist is legislative harmonization with the European Union laws. The second is regional cooperation

and creation of one energy market for all Western Balkan countries.

This study contributes to existing literature by exploring green transition in one emerging market such as Serbia.

In this paper, the authors have been analyzed numerous meta-data from relevant sources and combined with scenario planning. The aim was to forecast renewable potentials and production until 2030. The main renewables in Serbia are wind power and solar energy.

There are limitations of this study. The fist one is specific reaserch context i.e. Serbia. Another limitation is qualitative method of research. Third limitation is available data for renewables in Serbian environment according to EU methodology.

Future study will include one or more countries from Western Balkans. This will enable usage of the comparative method. If we include all Western Balkan countries the future study can be use to test proposed measures in domain energy efficiecy and green transition.

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REGIONAL INSIGHTS: INVESTIGATING INNOVATIVE ENTREPRENEURSHIP AND INTERNATIONAL TRADE PATTERNS IN RUSSIA

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***Abstract**: Today's globe recognizes innovative processes and entrepreneurial endeavors as essential components of dynamic economic development. Entrepreneurship, which is a transforming element in bringing new ideas to reality, and innovations, which drive development, have an impact on social interactions, the economy, and the general standard of life in society. The combined discussion in this exchange captures an extensive investigation of several aspects associated with innovative entrepreneurship and international trade. The definitions of innovative entrepreneurship as well as the main factors influencing it were considered. The work assessed the innovative entrepreneurship of the constituent entities of the Russian Federation. There is proposed a methodology for index evaluation of a region. The article presents the results of a cluster analysis of regional differentiation in the state of Russian innovative entrepreneurship in relation to international trade. Cluster analysis approaches allow different regions to be grouped into target clusters based on data of several indexes of a region's innovative and trade indicators. Study was carried out on the basis of data from official state regional statistics. The relevance of making this distinction is observed to determine further measures to improve the situation in the regions.*

***Keywords**: innovative entrepreneurship, cluster analysis, index method, international trade, innovation*

***JEL classification**: L26, O31, R11*

1. INTRODUCTION

In today's global landscape, innovative processes and entrepreneurial ventures drive economic growth globally. Entrepreneurship transforms ideas into reality, merging with innovations to advance society. This impact is crucial in regional development, where combining innovative entrepreneurship with international trade can boost economic vitality and sustainable growth.

This article embarks on a comprehensive exploration of the intricate dynamics underlying innovative entrepreneurship and international trade patterns within the context of Russia's diverse regional landscape. At its core, this investigation seeks to unravel the multifaceted nature of innovative entrepreneurship, delineate its defining characteristics, and elucidate its role as a catalyst for regional development.

The purpose of this study is to propose a method for quantitatively assessing the impact of innovative entrepreneurship on the development of international trade. Central to our inquiry is the adoption of a rigorous methodological framework grounded in cluster analysis techniques. By harnessing the power of data-driven insights, we aim to uncover the nuanced regional differentiation in the state of Russian innovative entrepreneurship vis-à-vis international trade. Through a systematic synthesis of regional indicators, we seek to identify distinct clusters that encapsulate the diverse trajectories and characteristics exhibited by different regions.

The relevance of this study extends far beyond academic discourse, resonating profoundly within the realm of policy formulation and strategic decision-making. By offering empirically grounded insights into the regional landscape of innovative entrepreneurship and international trade, this research equips policymakers, stakeholders, and researchers with the knowledge needed to craft targeted interventions that drive inclusive and sustainable development across all regions of Russia.

In the subsequent sections, we delve into a comprehensive examination of the conceptual underpinnings of innovative entrepreneurship, explore diverse definitions articulated by leading

scholars, and elucidate the key influencing factors shaping its trajectory within the Russian context.

2.GENERAL CHARACTERISTICS OF INNOVATIVE ENTREPRENEURSHIP

2.1. DEFINITIONS OF INNOVATIVE ENTREPRENEURSHIP

The foundation of any study on innovative entrepreneurship rests upon a clear understanding of its definitions and conceptual frameworks. This literature review aims to establish a robust comprehension of innovative entrepreneurship by synthesizing and analyzing its diverse definitions as presented in the scholarly literature. Numerous scholars have already examined innovative entrepreneurship in general (Романенко, Романов, 2020; Иванов, 2021; Пашаян, 2022).

The results and the comparative analysis of different definitions are presented in the table 1:

Table 1. Definitions of innovative entrepreneurship

Definitions	Authors	+/-
The process of creating and using technical and technological innovations for commercial purposes (Кадакоева, 2014)	G. Kadakoeva	+: reflects entrepreneurial concepts -: doesn't show the full picture of innovations
The process of managing, the innovative process of creating something new, which is based on the constant search for new ideas (Гетман, Ненахова, Чистова, 2011)	Hetman B. and Nenakhova O.б Chistova V.	-: doesn't reflect entrepreneurial concepts
The innovative process of managing that also includes the risk of implementing these innovations and the associated responsibility that the entrepreneur himself takes on (Шаров, 2010)	Sharov A.	+: includes the concomitant risk -: doesn't reflect entrepreneurial concepts about profit
The creation of new products, services, production methods, or business models, that critical for firm, industry, and economic growth and a key determinant of societal well-being (Bradley et al, 2021)	Bradley S.	+: reflects economical side -: doesn't reflect entrepreneurial concepts; not fully gives explanation about innovative part
A new class of entrepreneurs capable of making the transition from one technological order to another (Корсун, Бадмаева, 2022)	Korsun T. and Badmaeva C.	-: doesn't reflect entrepreneurial concepts and innovative aspects
The process leading to the creation of better goods (products, services) and technologies through the practical use of innovations (Крутилина, 2013)	Krutilina S.	-: doesn't reflect entrepreneurial concepts
Consists of entrepreneurs who are distinguished by an innovative type of thinking aimed at finding innovations, new ideas and the search for their implementation (Друкер, 2007)	Drucker P.	+: reflects correct definition of innovations -: doesn't reflect entrepreneurial concepts

Source: *compiled by the author.*

Summarizing the above, we can give an author's definition, that innovative entrepreneurship is the process of developing some kind of innovation or prior goods with new methods leading to innovative changes that result in a new market or satisfaction of new needs and brings monetary gain.

2.2.FACTORS THAT INFLUENCE ON INNOVATIVE ENTREPRENEURSHIP

The main factors that influence innovative entrepreneurship are the institutional framework of a country including political stability, government effectiveness, regulatory quality, rule of law, ease of starting a new business, and ease of obtaining credit (Nurjana et al, 2022), and the interaction between entrepreneurial competencies and innovation barriers (Sedeh, Pezeshkan and Caiazza, 2021). Additionally, the development of entrepreneurial innovation in the rural environment is influenced by factors such as competitiveness at a macroeconomic level, the interaction of elements in Porter's diamond, and external institutions (Harpa, 2017). Economic growth, unemployment, establishment size, and human capital are significant drivers of entrepreneurial activity at both the regional and country level (Civera, Mabel, Fernando). The professional and educational background of founders, the presence of intellectual property assets, and the role of research and development investment also play a role in start-ups' success (Breschi et al, 2018). Region-specific institutions, including normative, cultural-cognitive, and regulative factors, have a significant impact on regional innovative entrepreneurship (Demirdag, Eraydin, 2022).

3.METHODOLOGY

The specification of the innovation market lies in the fact that the cost and price of innovations in the market are formed under the influence of the economic resulting interaction of factors of a particular production, and not only under the influence of the magnitude of aggregate supply and demand (Киселев, 2010). The export of high-tech products is the most important result of the activities of innovative entrepreneurship in the country, primarily because export abroad to a certain extent guarantees the real competitiveness of manufactured products (Баринова et al, 2018).

The Russian economy's success hinges on developing its diverse regions to drive economic modernization, international trade growth, and entrepreneurship. Russia's regions function as intricate management systems affected by various factors. Cluster analysis groups regions based on statistical indicators to study regional development patterns, identifying common growth issues and optimizing economic processes.

The suggestive indicators for characterizing the innovative entrepreneurship and international trade are presented in the table 2. All the data can be found in the official Federal State Statistics Service of Russian Federation – Rosstat (https://rosstat.gov.ru/ (access 25.01.2024)).

Table 2. Indicators for the factors

Indicator	Characteristic
Volume of shipped innovative goods, services, works, mln rub (x_1)	Innovative Products and Technologies
Advanced production technologies used, units (x_2)	
Internal costs for research and development by constituent entities of the Russian Federation, mln rub (x_3)	Scientific and Technical Potential
Costs of innovative activities of organizations, mln rub (x_4)	
Number of personnel engaged in research and development, people (x_5)	
Share of shipped innovative products (works, services) in the total volume of shipped goods, performed works, services, % (x_6)	Economic Efficiency and Competitiveness
Innovative activity of organizations (share of organizations that carried out technological, organizational, and marketing innovations in the reporting year), % (x_7)	
Share of costs for innovation activities in the total volume of goods shipped, work performed, services, % (x_8)	
Export, mln $ (x_9)	International trade
Import, mln $ (x_{10})	

***Source**: compiled by the author.*

The data of 90 Russian entities was used for 2021 (latest fully published data from the official statistical website).

We have applied an index method in order to move from a model with initial indicators to a dimensionless model (we use a scale of 0 to 1) using the formula 1 below:

$$X_i = \frac{x-a}{b-a} \quad (1)$$

Where x – raw digit in data, a – the "minimum" value of this variable among regions, b – "maximum" value of this variable among regions.

The following formulas were implemented (2-7) for calculating indicators:

$$InE = \sqrt{IPT * STP * EEC} \quad (2)$$

$$IT2 = \sqrt{IT1} \quad (3)$$

$$IPT = \sqrt{x_1 \times x_2} \quad (4)$$

$$STP = \sqrt[3]{x_3 \times x_4 \times x_5} \quad (5)$$

$$EEC = \sqrt[3]{x_6 \times x_7 \times x_8} \quad (6)$$

$$IT1 = \sqrt{x_9 \times x_{10}} \quad (7)$$

Where InE – Innovative entrepreneurship, IPT – Innovative products and technologies, STP – Scientific and technical potential, EEC – Economic efficiency and competitiveness, IT1 – International trade (initial), IT2 – International trade (final).

An additional transformation was applied to the international trade indicator to ensure comparability and balance among the indicators used in our cluster analysis. While the initial square root transformation helped mitigate the skewness in the distribution of international trade values, we found that applying another transformation, such as a square root, further normalized the data and improved the alignment with the innovative entrepreneurship indicator. This additional transformation aimed to enhance the robustness of our analysis by ensuring that all indicators contribute equally to the clustering process, thus facilitating a more meaningful interpretation of the results.

As a starting point (InE0, IT0), we took the arithmetic mean value of the InE and IT indexes.

The groups are gathered by the following system (Table 3):

Table 3. Groups of measurement

Group 1	InE > InE0, IT > IT0
Group 2	InE > InE0, IT < IT0
Group 3	InE < InE0, IT < IT0
Group 4	InE < InE0, IT > IT0

***Source**: compiled by the author.*

4.RESULTS

Results of the cluster analysis are presented in Table 4, where R states for Region, Rep states for Republic:

Table 4. Distribution of regions by groups

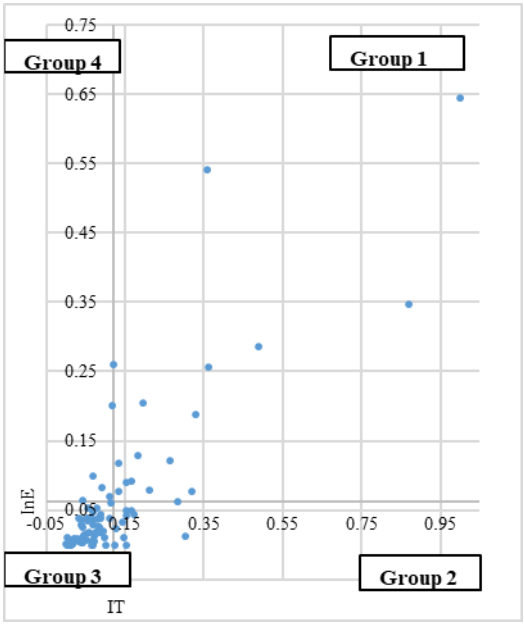
Cluster	Regions	Amount
Group 1	Central Federal District, Moscow R, Moscow, Northwestern Federal District, St. Petersburg, Southern Federal District, Rostov R, Volga Federal District, Rep of Tatarstan, Samara R, Ural Federal District, Sverdlovsk R, Tyumen R, Siberian Federal District, Altai Rep, Omsk R, Rep of Buryatia	17
Group 2	Belgorod R, Tula R, Rep of Bashkortostan, Perm R, Nizhny Novgorod R, Far Eastern Federal District	6
Group 3	Bryansk R, Vladimir R, Voronezh R, Ivanovo R, Kaluga R, Kursk R, Lipetsk R , Ryazan R, Smolensk R, Tambov R, Tver R, Yaroslavl R, Rep of Karelia, Komi Rep, Arkhangelsk R, Vologda R, Murmansk R , Novgorod R, Pskov R, Rep of Adygea, Rep of Kalmykia, Rep of Crimea, Astrakhan R, Volgograd R, Sevastopol, North Caucasus Federal District, Rep of Dagestan, Rep of Ingushetia, Kabardino-Balkarian Rep, Karachay-Cherkess Rep, Northern Rep Ossetia - Alania, Chechen Rep, Stavropol Territory, Mari El Rep, Mordovia Rep, Udmurt Rep, Chuvash Rep, Kirov R, Orenburg R, Penza R, Saratov R, Ulyanovsk R, Kurgan R, Rep of	57

	Tyva, Rep of Khakassia, Altai Territory, Krasnoyarsk Territory, Tomsk R, Rep of Sakha (Yakutia), Transbaikal Territory, Kamchatka Territory, Primorsky Territory, Amur R, Magadan R, Sakhalin R, Jewish Autonomous R, Chukotka Autonomous R	
Group 4	Kostroma R, Oryol R, Kaliningrad R, Leningrad R, Krasnodar R, Chelyabinsk R, Irkutsk R, Kemerovo R, Novosibirsk R, Khabarovsk R	10

***Source**: compiled by the author.*

Picture 1 shows the distribution of these regions by clusters, where IT is the Y axis, InE is the X axis:

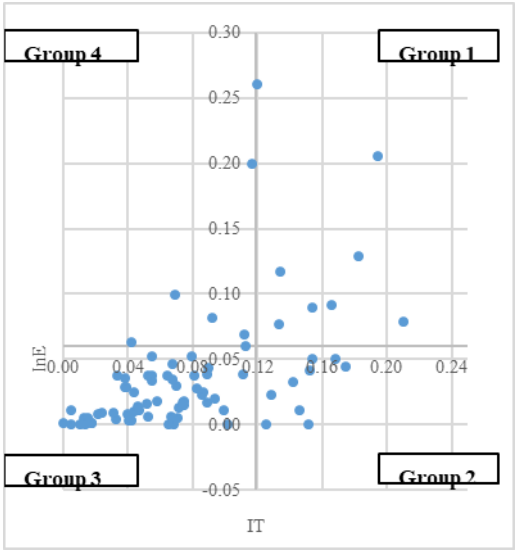
***Picture 1**. Distribution of regions by cluster*



***Source:** compiled by the author.*

Picture 2 shows an enlarged representation:

***Picture 2.** Enlarged distribution of regions by clusters*



***Source:** compiled by the author.*

5.DISCUSSIONS AND CONCLUSIONS

The first cluster represents regions characterized by robust levels of both innovative entrepreneurship and international trade activities. These areas likely boast thriving economies supported by robust innovation ecosystems and active integration into global trade networks.

In contrast, the second cluster presents a nuanced scenario where regions demonstrate significant levels of innovative entrepreneurship but comparatively lower engagement in international trade. Despite possessing vibrant innovation ecosystems and sustained investment in innovative initiatives, these regions encounter challenges in achieving optimal levels of international trade activity. These challenges may stem from constraints in accessing international markets or participating in global trade networks.

Conversely, the third cluster mirrors the characteristics of the first cluster but in a negative context, albeit comprehensible. Here, innovative entrepreneurship inadequately contributes to the advancement of international trade in Russia.

The fourth cluster highlights regions exhibiting notable levels of international trade activity even in the absence of significant innovative entrepreneurship. Despite potential for further improvement through enhanced innovation efforts, these regions demonstrate higher reliance on trade activities for economic growth.

Regarding to the distribution of the regions by clusters we proved again that there is a giant gap between the leaders (Central Federal District, Northwestern Federal District and Moscow) and

remaining country. This discrepancy underscores the limited extent to which innovative activity contributes to Russia's international trade.

Based on the provided cluster analysis of Russian regions based on indicators of innovative entrepreneurship and international trade, it appears that the majority of regions fall into the third group, characterized by low values on both axes. This suggests a prevailing lack of substantial engagement in innovative entrepreneurial endeavors and international trade across these regions.

The significant gap observed between the majority of Russian regions and three leaders could be attributed to a combination of several factors like economic concentration, infrastructure, and global connectivity (key industrial centers, ports, and strategic transportation networks, facilitating robust economic growth and development), innovation ecosystems (including educational and research institutions), some policy priorities and support, and even some historical and cultural factors.

In essence, addressing these disparities necessitates nuanced policy interventions and strategic initiatives tailored to harness regional strengths and mitigate structural constraints, thereby fostering more equitable and sustainable economic development trajectories across the country.

In conclusion, this article has shed light on the intricate interplay between innovative entrepreneurship and international trade patterns in the context of Russia's regional landscape. By meticulously examining various definitions of innovative entrepreneurship and identifying key influencing factors, we have laid a solid foundation for our subsequent analysis.

The centerpiece of our investigation lies in the application of cluster analysis techniques to unveil regional differentiation in the state of Russian innovative entrepreneurship vis-à-vis international trade.

The theoretical significance of this study lies in its contribution to advancing our comprehension of the dynamics shaping innovative entrepreneurship within the realm of international trade. By elucidating the connections between various factors and their impact on regional development, our work enriches scholarly discourse and lays the groundwork for further exploration.

Furthermore, the practical implications of our research are profound, particularly in highlighting the substantial disparity between the Central Federal District, Moscow, and other regions. This insight underscores the imperative for targeted interventions aimed at bridging this gap and fostering more inclusive and sustainable development across all regions.

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ENHANCING LABOR PRODUCTIVITY THROUGH INTRAPRENEURSHIP DEVELOPMENT: AN INTEGRATIVE REVIEW OF THEORETICAL PERSPECTIVES

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***Abstract**: Intrapreneurship, as a mechanism enabling employees to realize entrepreneurial visions within organizational frameworks, is increasingly acknowledged as a pivotal strategy for fostering entrepreneurial orientation and driving innovation and growth in contemporary business landscapes. However, a notable gap persists in the theoretical underpinnings concerning the manifestation of intrapreneurial behavior among employees. This study seeks to address this lacuna by examining the theoretical foundations of intrapreneurship's evolution and its correlation with labor productivity. Employing a literature review, specifically adopting an integrative approach, this research synthesizes existing literature to elucidate the theoretical perspectives on intrapreneurship development and its implications for labor productivity. The research materials encompass empirical studies that have employed relevant theoretical frameworks and extant theoretical inquiries pertaining to intrapreneurship. Synthesizing these materials reveals three overarching themes in theoretical foundations: the evolution of intrapreneurship, the nexus between creativity, innovation, and productivity, and theories surrounding organizational behavior and productivity. Moreover, a synthesis of these theories for practical application in intrapreneurship research was provided. The implications of this study extend to enriching the understanding of intrapreneurship development and its impact on labor productivity. Furthermore, the synthesized theoretical insights offer valuable guidance for future empirical research endeavors, facilitating a deeper exploration of employees' intrapreneurial behavior within organizational contexts.*

***Key words**: intrapreneurship, labor productivity, creativity, innovation, theoretical perspective.*

***JEL classification:** J24, L26, M54*

1. INTRODUCTION

The concept of intrapreneurship can be traced to the 1980s, when it was first introduced by Gifford Pinchot III, culminating in his book in 1985 Intrapreneuring (Pinchot, 1985). Since then, the practice of intrapreneurship is increasingly can be observed in the business practice. This is coincided with the shift towards more agile, adaptive, and collaborative organizational models that prioritize innovation, employee empowerment, and societal impact in an ever-changing business landscape. Simultaneously, the intrapreneurship research as a critical research topic in economic and management science has experienced its evolution from its emergency and definition to the identification of antecedents and outcomes to measurement and scale development. Until today, the intrapreneurship research has increasingly integrated with innovation management and corporate strategy to increasing labor productivity, and organizational competitiveness(Wenjun et al., 2024). Besides, intrapreneurship research has also benefited from cross-disciplinary perspectives (Chahine, 2021), drawing insights from fields such as organizational behavior, entrepreneurship, strategic management, and innovation studies.

Theory is the key to explaining difficult problems, deriving hypotheses, enlightening practice, and predicting related phenomena (Wacker, 2008). The history of intrapreneurship research reflects its evolution from a nascent concept to a well-established field of study, with scholars continuously advancing theory and practice to enhance our understanding of how intrapreneurship contributes to organizational success and societal impact. However, tracing back to the research of intrapreneurship research, there is still lacking of theoretical inquiries regarding the essence and development of intrapreneurship as a way of increasing labor productivity from the modern perspective. This theoretical perspective to

the intrapreneurship is important as theoretical perspectives provide a foundation for understanding, analyzing, and predicting phenomena related to intrapreneurship.

At least four reasons justify the necessity to the theoretical inquiry of intrapreneurship research. Firstly, theoretical perspectives help in clearly defining intrapreneurship, distinguishing it from related concepts such as entrepreneurship, innovation, and corporate entrepreneurship. This clarity is essential for academic discourse, allowing researchers to build upon a common understanding and avoid ambiguity in their studies. Secondly, theoretical frameworks elucidate the mechanisms and processes that drive intrapreneurship within organizations. They explore how various factors such as organizational culture, structure, and leadership influence intrapreneurial activities. This understanding is crucial for developing strategies to foster intrapreneurship. Thirdly, theoretical perspectives serve as a roadmap for research, guiding the formulation of hypotheses, selection of research design, and choice of methods for data collection and analysis. They ensure that research efforts are systematic, coherent, and built upon existing knowledge. What's more, as abovementioned the increasing integrative and cross-disciplinary nature of intrapreneurship research in today's academic discourse present us the need to have an integrative review of the theoretical perspectives of enhancing labor productivity through intrapreneurship development.

In order to fill the research gap, this article aims to examining the theoretical foundations of intrapreneurship's evolution and its correlation with labor productivity. Specifically, this research synthesizes existing literature to elucidate the theoretical perspectives on intrapreneurship development and its implications for labor productivity, including the evolution of intrapreneurship, the nexus between creativity, innovation, and productivity, and theories surrounding organizational behavior and productivity. A primary attention is put on the practical application in intrapreneurship research. This article is structured as follows. Firstly, this article explores the origins of intrapreneurship as both a business practice and research subject. Secondly, this article investigates three perspectives to look at intrapreneurship as a way to enhance labor productivity. Lastly, this paper ends with a discussion on the theoretical perspective on intrapreneurship and conclude the main points of this article.

2. INTRAPRENEURSHIP AS A GROWING DEMAND

Etymologically, the term "intrapreneurship" derives from a conflation of "intra," signifying 'within', and "entrepreneurship," which refers to the creation of new enterprises. According to this foundational understanding, intrapreneurship is generally characterized as entrepreneurial activities conducted within the confines of an established organization. To further refine the concept, scholars categorize intrapreneurship into two distinct behavioral types: strategic renewal behavior and venture-creating behavior. Strategic renewal behavior entails proactive efforts by employees to identify and exploit opportunities and advantages within their organizational environment (Ireland et al., 2003). Conversely, venture-creating behavior involves the initiation and development of activities aimed at the allocation and utilization of resources necessary for launching new business ventures (Narayanan et al., 2009).

Under modern new economic conditions, creating new knowledge and production mode is an inevitable requirement for enterprises to remain competitive (Rastogi, 2000). According to the American labor economist Reich (2002), the new economy is founded on two primary principles. The first principle of these modern economic conditions is the widening of economic choices for buyers, making it easier for them to switch and secure better deals. The second principle is that this expanded range of choices and ease of switching is diminishing the security of all sellers, rendering them more vulnerable to competitors. Behind these two principles, the major driving force of the new economy, is the new technology and knowledge as the new technologies of communication, transportation, and information have dramatically widened consumer choice and made it easier for all consumers. As a results, modern economy has witnessed its transformation from stable large-scale production where profit came from economy of scale to continuous innovation where profit mainly came from quickness to innovate and attract customers. This has been foreseeably anticipated by Josef Schumpeter, even before the era of large-scale production (Schumpeter and Swedberg, 2021). His ideas are especially cumulated in his book the economy of development, where he places the entrepreneur at the heart of capitalism, anticipating subsequent fascination with entrepreneurship in popular business and management writing and lays the groundwork for his subsequent concept of 'creative destruction' characteristic of radical and rapid economic change.

The emergency of entrepreneurship is coming into being under this broad context with the understanding of the traditional limitations of the narrow understanding of entrepreneurship and the shift from entrepreneurship to corporate entrepreneurship and to intrapreneurship. Employing the resource-based theory, the possession of strategic resources provides an organization with a golden opportunity to develop competitive advantages over its rivals (Barney, 1996). This can be well reflected in the exploitative resources possessing by the individual entrepreneurs or intrapreneurs within an entrepreneurial organization. Even though entrepreneurs can enjoy more flexibility and autonomy to pursue their innovative ideas, they are facing the limitations such as resources, networks, and infrastructures. However, for an intrapreneurial who similarly would like to identify entrepreneurial opportunities, they enjoy the existing resources, networks of infrastructures, but their innovative ideas might be burdened by formalized processes, hierarchies, and risk aversion tendency of an organization. Thus, the core principle of intrapreneurship is to identify and solve the barriers to the motivation to labor's entrepreneurial ideas and behaviors. Correspondently, with the evolving nature of work in the new economy, re-evaluation of labor productivity metrics from the intrapreneurship side in the context of technological advancements and digital transformation is of great importance.

3. THREE PERSPECTIVES TO LOOK AT INTRAPRENEURSHIP

3.1 THE EVOLUTION OF INTRAPRENEURSHIP

A theory is an explained set of conceptual relationships, containing properties such as definitions, domain, relationships, and predictions (Wacker, 2008). The definition facets of intrapreneurship delve into inquiries regarding who and what. For example, Antoncic and Hisrich (2003) contribute to the theoretical development of intrapreneurship by elucidating its concept, particularly highlighting its nature as emergent behavioral intentions and actions that diverge from traditional business practices, thereby situating it within the management literature. Gündoğdu (2012) investigates the interrelationships among entrepreneurship, intrapreneurship, and innovation, proposing the concept of 'innopreneur' as an optimal synthesis of these elements. He emphasizes the significance of innopreneurship for fostering innovation within organizations in a rapidly evolving business environment.

The domain of intrapreneurship's aspects encompasses inquiries into the when and where. As an illustration, Hisrich (1990) examines the psychological aspects and characteristics inherent in both entrepreneurship and intrapreneurship. Pinchot (1985) analyzes the characteristics and processes of intrapreneurs and how organizations can foster an intrapreneurial culture. In subsequent work, Pinchot (1987) posits that in-house entrepreneurs enhance the speed and cost-effectiveness of transferring technology from research and development to the market. Elert and Stenkula (2022) delineate a taxonomy that describes the interaction between societal and organizational rules and their impact on intrapreneurial outcomes. Their classification includes fully productive intrapreneurship that benefits both the firm and society, primarily productive intrapreneurship that favors societal over organizational interests, mainly non-productive intrapreneurship that favors organizational over societal interests, and fully non-productive intrapreneurship that is detrimental to both.

The relationship aspects of intrapreneurship delve into questions of how and why. For instance, Carrier (1994) explores intrapreneurship within small and medium-sized enterprises (SMEs), focusing on the differential factors that influence its emergence and development in comparison to large firms. He notes distinct differences in structural context, relational context, reward mechanisms, strategic processes, and the implications of intrapreneurial dissatisfaction. Carrier (1996) further conducts an exploratory study on various intrapreneurship types, the factors influencing its emergence, motivational aspects for intrapreneurs and owner-managers, and involved strategic processes. Wennekers and De Jong (2008) provide a comprehensive examination of intrapreneurship's activities and behavioral aspects, discussing its similarities and differences with independent entrepreneurship and addressing measurement issues and the initial construction of a nomological network for validation purposes.

The predictive facets of intrapreneurship delve into questions of should, could, and would. In particular, Covin and Slevin (1986) develop an organizational-level entrepreneurship scale and further investigate the positive correlation between firm performance and an entrepreneurial orientation in hostile environments (Covin and Slevin, 1989). They ultimately outline a conceptual model of entrepreneurship as an organizational phenomenon, identifying its antecedents, consequences, and moderating variables (Covin and Slevin, 1991). Lumpkin and Dess (1996) elaborate on the entrepreneurial orientation construct and propose a framework for examining its relationship with firm performance.

Their subsequent studies investigate the impact of entrepreneurial orientation on corporate entrepreneurship and new venture performance, considering factors like venture age (Lumpkin et al., 2006).

3.2 THE INTERPLAY BETWEEN CREATIVITY, INNOVATION, AND PRODUCTIVITY

The interplay between creativity, innovation, and productivity was theorized by Schumpeter's theory on economic development, Von Mises's Australian economic traditions and his theory on profit, loss, human action, Reich's proposition on labor well-being and productivity in the new economy, Paul Romer's endogenous growth theory's emphasis on the driving role of human capital, innovation, and knowledge in economic growth, knowledge spillover theory of Entrepreneurship, Teresa Amabile's componential theory of creativity, and her contribution on how individual creativity contributes to organizational innovation and productivity.

Schumpeter's theory on economic development underscores the critical role of innovation and entrepreneurship in driving growth and prosperity (Schumpeter and Swedberg, 2021). Intrapreneurship, by encouraging innovation within organizations, aligns closely with this theory and can contribute significantly to enhancing labor productivity and fostering economic development.

Ludwig von Mises's theories, particularly those related to human action, profit, and loss, hold substantial relevance to the intrapreneurship research. Firstly, Von Mises's theory of human action, often referred to as "praxeology", posits that economics is a branch of a broader study of human behavior. He argued that human action is purposeful behavior directed at achieving specific ends (Von Mises, 2016). In the context of corporate entrepreneurship, this suggests that intrapreneurs are motivated by personal and professional goals, including career advancement, personal satisfaction, and the potential for financial reward. Secondly, in a corporate setting, von Mises's concepts of profit and loss can be applied to measure the success and efficiency of intrapreneurial projects. Projects that generate value for the company can be seen as profitable, justifying further investment and resource allocation. What's more, Von Mises argued that profit and loss signals help guide the allocation of resources in a free market (Von Mises, 1951). Similarly, in a corporate environment, effective resource allocation is critical for supporting innovation.

Reich (2002) in his propositions and analyses delves into the evolving nature of labor, well-being, and productivity in what he terms the "new economy." In his proposition of the new economy, there are two basic principles. The first principle is that choices are widening and it's becoming ever easier for buyers to switch and get a better deal. The second principle is that such breadth of choice and ease of switching is rendering all sellers less secure and more vulnerable to competitors - thus spurring innovation. In one word, the economy is shifting out of stable large-scale production toward continuous innovation. Among the process, new technologies of communication, transportation, and information are the major driving forces. Under this background, Reich emphasizes the importance of skill development, adaptability and job design in the future of work which is relevant to the need of intrapreneurship.

Romer's endogenous growth theory provides a theoretical foundation for understanding the mechanisms through which innovation, human capital, and knowledge contribute to economic growth, and by extension, how these elements can be harnessed within corporations to drive intrapreneurial success and organizational advancement (Romer, 1990). Firstly, according to Romer, innovation not only drives economic growth at the macro level but can also propel growth and competitive advantage at the organizational level. Companies fostering an intrapreneurial culture encourage their employees to develop new ideas and innovations that can lead to significant business enhancements and new market opportunities. Secondly, the theory's focus on human capital as a catalyst for growth underscores the importance of investing in employee skills and knowledge within a corporation. By enhancing their workforce's capabilities, companies can better innovate and adapt to changing market conditions.

The Knowledge Spillover Theory of Entrepreneurship highlights the significance of knowledge as a catalyst for entrepreneurial activity, emphasizing the transformation of unused or under-utilized knowledge into economic value through new business ventures (Acs et al., 2009). This theory has shaped much of the current understanding of the dynamic relationship between innovation, entrepreneurship, and economic development. The Knowledge Spillover Theory of Entrepreneurship provides valuable insights into how companies can systematically harness and cultivate the entrepreneurial potential of their employees. By creating environments that encourage the identification and development of new ideas generated from within, companies can

drive innovation and growth through corporate entrepreneurship and intrapreneurship.

Componential Theory of Creativity offers a comprehensive framework for understanding the factors that influence creativity at the individual and group levels within corporate settings. Her framework helps explain how creativity can be systematically fostered within an organization, a critical component for successful corporate entrepreneurship (Amabile, 2019). Amabile's emphasis on the work environment as a catalyst or inhibitor of creativity directly addresses how corporations can create a culture conducive to intrapreneurship. In corporate settings, fostering intrinsic motivation is key for nurturing intrapreneurial behavior. According to Amabile, when individuals are intrinsically motivated, they are more likely to engage deeply with their work and pursue innovative and risky projects. Amabile highlights the importance of social environments in enhancing creativity. For intrapreneurial teams, creating a dynamic where ideas are freely shared, and diverse viewpoints are valued can lead to more innovative solutions.

3.3 THEORIES CONCERNING ORGANIZATIONAL BEHAVIOR AND PRODUCTIVITY

Theories concerning organizational behavior and productivity was insighted by principal-agent theory in the institutional economic tradition, trait-activation theory by Tett and Guterman (2000), social information processing theory by Salancik and Pfeffer (1978), theory of planned behavior by Ajzen (1991), Social identity theory by Ashforth and Mael (1989).

The principal-agent theory, also known as agency theory, is a framework used to address issues that occur in relationships where one party (the principal) delegates work to another party (the agent), who performs that work (Akdere and Azevedo, 2005; Zhang Weiying, 2013). The Principal-Agent Theory can be applied to understand intrapreneurial behavior within organizations by examining the dynamics between company executives (principals) and employees (agents) who are tasked with developing and executing innovative projects. This theory helps in analyzing how motivations, incentives, and information asymmetry influence intrapreneurial activities. Some ways this theory can be applied to elucidates intrapreneurial behavior including: alignment of interests, reducing information asymmetry, mitigating maoral hazard, Adverse Selection in Intrapreneur Selection.

By leveraging the principles of Trait-Activation Theory (TAT), organizations can more effectively cultivate an intrapreneurial culture. This theory provides a robust framework for aligning individual capabilities with organizational goals, thus enhancing the potential for innovation and entrepreneurship within established companies (Tett and Guterman, 2000). Firstly, TAT helps identify which personality traits are conducive to intrapreneurial success. Traits such as creativity, risk-taking, proactivity, and resilience can be crucial for intrapreneurs. Secondly, by applying TAT, organizations can design work environments that specifically activate desirable entrepreneurial traits. For instance, providing autonomy in project management might activate an individual's self-direction trait, essential for intrapreneurial success. Thirdly, TAT informs how roles can be tailored to match the personality traits of employees, enhancing job satisfaction and performance. In the context of intrapreneurship, roles that require high levels of innovation and responsibility can be designed or assigned to individuals whose entrepreneurial traits are activated by such demands.

Social Information Processing Theory (SIPT), developed by Gerald Salancik and Jeffrey Pfeffer in the late 1970s and further explored in their subsequent works, is a theoretical framework that focuses on how individuals perceive, interpret, and respond to social information within their environment (Salancik and Pfeffer, 1978). This theory was primarily formulated to understand how employees' attitudes and behaviors are influenced by social cues in the workplace. By integrating Social Information Processing Theory into intrapreneurship research, scholars and practitioners can better understand and facilitate the complex social dynamics that influence intrapreneurial success within organizations. This understanding can lead to more effective strategies for cultivating a supportive intrapreneurial ecosystem that drives innovation and competitive advantage.

The Theory of Planned Behavior (TPB), developed by Icek Ajzen in 1985, is a psychological theory that seeks to explain human behavior across various contexts (Ajzen, 1991). This theory is an extension of Ajzen's earlier Theory of Reasoned Action (TRA), which he co-developed with Martin Fishbein. TPB adds the component of perceived behavioral control to address limitations in the TRA, particularly regarding behaviors over which people have incomplete volitional control. By applying the Theory of Planned Behavior, researchers and practitioners in the field of intrapreneurship can gain valuable insights into how best to encourage and manage intrapreneurial behavior within organizations. This theory helps in understanding not just what motivates intrapreneurial behavior, but also how to structure

environments that nurture and sustain such initiatives.

Social identity theory, as elucidated by Ashforth and Mael (1989), provides critical insights into organizational phenomena through its refined concept of identification. Social identity theory suggests that the categorization of self and others into distinct social groups is essential in shaping an individual's identity. This identity plays a crucial role in addressing self-perception within an organizational setting. Social identity theory helps to explore the interplay between an individual's identity as an intrapreneur and the broader entrepreneurial orientation of the organization (Wenjun et al., 2023). Using Social Identity Theory to understand intrapreneurial behavior provides a nuanced view that extends beyond individual characteristics to consider broader social and organizational contexts. It underscores how identities formed through group affiliations and organizational culture can drive the behaviors necessary for intrapreneurship.

4. DISCUSSION

Table 1. Summarization on three trajectories of theory regarding intrapreneurship

Trajectories	Functions
The evolution of intrapreneurship	Definitions: Who and what Domain: When and where Relationships: How and why Predictions: Should, could, would
The interplay between creativity, innovation, and productivity	Providing a foundational rationale for investigating intrapreneurship as a phenomenon within the labour market Assisting researchers in comprehending the process of intrapreneurship within organizational contexts
Theories concerning organizational behavior and productivity	Offering insightful perspectives on the behavioural manifestations of intrapreneurship

Source: Authoring

The three trajectories of theory regarding intrapreneurship as a way to labor proctivity and their functions are summarized (Table 1). The theoretical exploration of intrapreneurship elucidates certain fundamental characteristics of this economic phenomenon. A theory, as defined by Wacker (2008), is a systematically explained set of conceptual relationships, which includes definitions, domains, relationships, and predictions. Through summarizing key facets of intrapreneurship, this exploration furnishes future researchers with a comprehensive perspective on this field of study. Specifically, the investigation into the definitional aspects seeks to categorize intrapreneurship as a business or economic phenomenon, focusing on behavioral dimensions, differentiation from related concepts, and its association with organizational-level entrepreneurship. Regarding the domain of intrapreneurship, ongoing theoretical scrutiny aims to establish its niche within a specific area of inquiry. Notable attention is given to its placement within management literature, variations in its manifestation across small and medium enterprises (SMEs) versus larger corporations, and distinctions between organizational and individual levels. In terms of relationships, the current theoretical focus is on elucidating how intrapreneurship is stimulated and its interaction with other constructs. Key areas of focus include the drivers of intrapreneurial activity, the interplay between societal and organizational norms, and their resultant impacts on intrapreneurial outcomes, as well as the relevance of these outcomes to organizational performance. Finally, for the predictive dimension of intrapreneurship, researchers are endeavoring to determine methods for forecasting intrapreneurial behavior and how such behavior can predict organizational performance. This line of inquiry aims to develop predictive models that facilitate a deeper understanding of the dynamics and impacts of intrapreneurial actions within the corporate context.

We contend that theories concerning the nexus of creativity, innovation, and productivity fulfill at least two critical roles in the research of intrapreneurship. Firstly, they provide a foundational rationale for investigating intrapreneurship as a phenomenon within the labor market. For instance, the analysis of Schumpeter's theory on economic development, which underscores the pivotal role of innovation and entrepreneurship in fostering growth and prosperity, serves as a robust justification for examining intrapreneurship or corporate entrepreneurship as potential conduits for enhancing innovation to stimulate economic growth. Similarly, Ludwig von Mises' theories concerning human action, profit, and loss substantively justify research into the behavioral dimensions of intrapreneurship and corporate entrepreneurship. Additionally, Robert Reich's propositions regarding new work dynamics in the modern economy offer a basis for scholars to explore novel working methodologies, such as

intrapreneurial approaches, aimed at augmenting competitive advantage in the labor market. Secondly, these theories assist researchers in comprehending the process of intrapreneurship within organizational contexts. This includes theories like the knowledge spillover theory of entrepreneurship and Teresa Amabile's componential theory of creativity, which provide valuable frameworks for understanding how intrapreneurial activities can be systematically fostered and managed within companies. These theoretical perspectives are instrumental in delineating the mechanisms through which organizations can leverage internal creative capacities and innovative potentials to achieve substantial growth and development.

Theories pertaining to organizational behavior and productivity offer insightful perspectives on the behavioral manifestations of intrapreneurship. Our article integrates five pivotal theories from the domains of organizational behavior and corporate governance to elucidate these phenomena. Notably, principal-agent theory elucidates the challenges faced by potential intrapreneurs who exhibit behaviors aligned with strategic thinking and venture creation. Additionally, three other theories—trait-activation theory, social information processing theory, and the theory of planned behavior—provide diverse frameworks for understanding intrapreneurial behavior from distinct viewpoints. Specifically, trait-activation theory offers insights into the activation of certain intrapreneurial traits, enhancing our comprehension of intrapreneurial behaviors. Social information processing theory sheds light on the impact of social dynamics within organizations on intrapreneurial success. The theory of planned behavior contributes to our understanding of how to manage and foster intrapreneurial behavior by identifying motivational drivers and structuring supportive organizational environments. Lastly, social identity theory helps to explore the interplay between an individual's identity as an intrapreneur and the broader entrepreneurial orientation of the organization.

CONCLUSION

Theory is instrumental in addressing complex challenges, formulating hypotheses, illuminating practices, and predicting associated phenomena. In the domain of intrapreneurship research, there remains a notable deficiency in theoretical investigations into the nature and evolution of intrapreneurship as a mechanism to enhance labor productivity from a contemporary perspective. Our article delineates three theoretical trajectories that potentially enhance the understanding of intrapreneurial behavior and hold academic significance. The first trajectory involves the theoretical exploration of intrapreneurship itself, encompassing aspects such as definitions, scope, relationships, and prognostications. The second trajectory examines the theories concerning the interaction between creativity, innovation, and productivity. This not only provides a rationale for the study of intrapreneurship as a labor phenomenon but also aids researchers in comprehending the intrapreneurship process within organizational contexts. The third trajectory focuses on theories related to organizational behavior and productivity, offering insights into the behavioral manifestations of intrapreneurship.

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Review Article

TRENDS IN THE BANKING SYSTEM OF THE WESTERN BALKAN COUNTRIES

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***Abstract**: Financial development, as an inseparable part of economic development, entails the establishment and expansion of financial institutions, instruments, and markets. Developed financial infrastructure facilitates capital mobilization, helps in its efficient allocation, contributes to risk reduction, and facilitates the turnover of goods and services. Consequently, the development of the financial system acts as a catalyst for economic growth, raising living standards, reducing poverty, and enhancing societal economic well-being. Financial development is a dynamic process through which the financial system of a country evolves and transforms over time. In the countries of the Western Balkans, the first step towards financial development was the reform of the banking sector. The transformation of the banking sector was one of the most important aspects of the transition process from centrally planned to market economy. In this regard, the aim of this paper is to identify similarities and differences in financial development among Western Balkan countries through a comparative analysis and to highlight which segment of the financial system represents an obstacle to faster development in these countries. Generally accepted indicators of financial development, ensuring comparability across countries, include measures of size, activity, efficiency, and stability of the financial system.*

***Key words**: financial development, banking sector, capital market, Western Balkans*

***JEL classification:** G00, G21*

1. INTRODUCTION

The financial system occupies an important place in the modern economy thanks to its role of financial intermediation, i.e. channeling funds from surplus to deficit economic entities. A stable and efficient financial system encourages the mobilization of saving and allows it to be allocated to the most productive projects, thereby encouraging innovation and economic growth. Also, without a financial system that functions well, it is impossible to ensure macroeconomic stability and potential for the development of a country.

In order to evaluate the level of development of the financial system as a whole and its component elements (financial institutions and the financial market), numerous indicators are used. Empirical studies are mainly based on standard quantitative indicators for the calculation of which data are available in appropriate national and international databases. Considering the complexity of the financial system, in practice it is very difficult to see all aspects of its functioning. Based on a certain number of indicators, analysts and researchers tend to see the appropriate dimensions and, mainly by comparative analysis of the performance of national financial systems in certain regions or countries with a similar level of GDP per capita, draw conclusions about the level of their relative financial development.

The subject of consideration in this paper is financial development in the countries of the Western Balkans. The Western Balkans is a term that has been used since the beginning of the XXI century. It includes the countries in the Balkans (Albania, Bosnia and Herzegovina, Macedonia, Serbia and Montenegro) that are on the way to European integration, and which in many respects share similar characteristics in the political and economic sense. According to the subject, the aim of this paper is to determine similarities and differences in the countries of the Western Balkans based on a comparative analysis of financial development and to indicate which segment of the financial system represents an obstacle to the faster development of these countries. Given that the financial systems in the observed countries are bank-centric, the

comparative analysis will be predominantly based on indicators of the development of the banking sector.

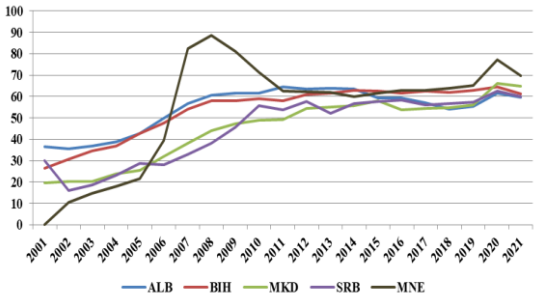
The paper is structured in the following way. After the introduction, the second part analyzes the indicators of the size and activities of the banking sector. The third part deals with the analysis of key indicators of the efficiency of the banking sector. In the fourth part, attention is paid to the analysis of financial stability. Finally, the fifth part of the paper contains concluding remarks.

2. SIZE AND ACTIVITY OF THE FINANCIAL SYSTEM

The size of the financial system can be determined based on the value of financial assets, both in absolute terms and through a relative ratio to gross domestic product (GDP). While identifying the absolute amount of financial assets from a given perspective is only informative, the ratio of financial assets to GDP facilitates benchmarking of the state of financial development and enables comparison between countries at different stages of their development. Alternative indicators of the size of the banking sector, and at the same time the size of the financial system, involve the calculation of the share of monetary aggregates (M1, M2, M3) in GDP. The most common indicator in the empirical literature is the share of monetary aggregate M2 in GDP (Benhabib & Spiegel, 2000; Bordo & Rousseau, 2006; Puatwoe & Piabuo, 2017). However, Demetriades & Fielding (2012) They indicate that the increase in M2/GDP ratios in less developed countries is often a reflection of the growth of cash in circulation, rather than the increase in the volume of bank deposits. This reflects the degree of monetization in the economy rather than the development of financial intermediation by banks (Taivan & Nene, 2016). Therefore, for the sake of reliability of the obtained result, as an alternative indicator of the size of the banking sector, the share of bank liabilities based on deposits in GDP is used, which excludes cash in circulation from the wider money supply (M2).

Based on the data for the share of commercial banks' assets in GDP shown in Figure 1, it is evident that at the beginning of the observed period, the banking sector in Albania recorded the highest values in terms of size and that it maintained a fairly stable trend throughout the period. The banking sectors in Bosnia and Herzegovina, North Macedonia and Serbia followed the trend of the Albanian banking sector, while recording slightly lower values. In the Figure 1 the dynamics of the share of bank assets in GDP in the case of Montenegro attracts special attention. At the beginning of the observed period, the Montenegrin banking sector had the lowest ratio of banks' assets/GDP, then in the years when the global crisis was the sharpest, this indicator recorded significantly higher values compared to other observed countries, and despite a significant decrease in the second half of the observed period, it remains at the highest level.

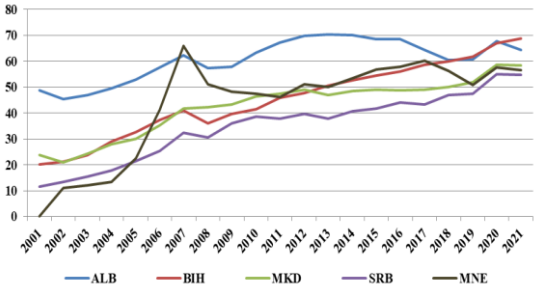
Figure 1. Assets of commercial banks (% of GDP)



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

Figure 2 shows the dynamics of the deposit base of banks in the analyzed countries. Based on the attached document, it can be seen that the highest values of racia deposits/GDP were recorded in Albania during the entire observed period, with the exception of 2007, when Montenegro recorded a slightly higher value. The deposit potential in North Macedonia, Bosnia and Herzegovina and Serbia recorded a stable, mostly growing trend, which is why Serbia has the lowest values of the share of deposits in GDP compared to other businesses.

Figure 2. Deposits in commercial banks (% of GDP)



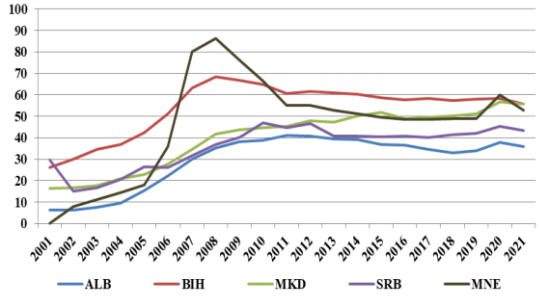
Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

An indicator of the activity of the banking sector, which is otherwise very common in empirical studies, is the share of the amount of domestic bank loans granted to the private non-financial sector in GDP. Considering that the calculation of

this indicator does not take into account loans granted to the government, government agencies and public enterprises, as well as loans granted by the central bank, this indicator can be considered relevant from the aspect of the contribution of financial development to the growth of the real sector. The growth in the amount of domestic loans indicates not only a higher level of domestic investments, but also the development of the banking sector and the financial system. In economies where more loans are granted to the private sector, banks are more active in mobilizing savings, collecting information on debtors, exercising corporate control and risk management. In the early 2000s, foreign investment in banking, combined with an increased deposit base, strengthened loans to the private sector in the Western Balkans (Murgasova et al., 2015).

Figure 3 shows the dynamics of the share of private non-financial sector loans in GDP. During the period preceding the emergence of the global crisis, bank loans to the private sector in the observed countries recorded intense growth. Although the growth rate of loans to the private sector varied from country to country, the most dynamic was the growth of loans to households, especially housing loans. "The carriers of the accelerated loan growth were, dominantly, foreign banks." They took advantage of the large differences in interest rates on the domestic market and in EU countries and brought in large amounts of capital. Domestic savings, which banks primarily focus on, were not sufficient to finance the expansion of loan growth either in terms of volume or maturity structure, as it was dominated by demand deposits. The import of foreign savings was the primary source of renewal of credit activity in all observed countries. The expansion of the loan offer was financed mainly by the borrowing of banks from their parent companies abroad." (Živković, 2011, 63)

Figure 3. Loans granted to the private sector (% of GDP)



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

The growing trend in the credit market starting in 2009 was replaced by stagnation in the countries of the Western Balkans (Figure 3). Among other things, the tightening of credit standards and growing aversion to risk led to a decrease in the lending activity of banks. According to the share of bank loans granted to the private sector in GDP after more than ten years, that is, at the end of 2021, the observed countries were at the level of credit activity they had immediately before the global recession. The highest level of credit activity was achieved by Bosnia and Herzegovina and North Macedonia, followed by Montenegro and finally Serbia and Albania.

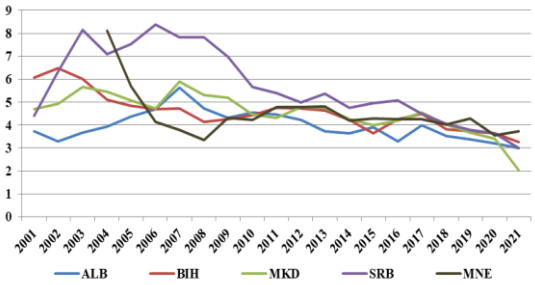
2. EFFICIENCY OF THE FINANCIAL SYSTEM

The sustainable development of the financial system and the extent to which it supports the activities of the real sector depend to a large extent on the efficiency with which intermediation takes place. Efficiency refers to the ability of the financial sector to provide high quality products and services at the lowest cost. Quantitative measures of efficiency that could be evaluated include: the ratio of approved loans to the private sector and deposits of commercial banks, net interest margin and operating expenses. The approved loans/deposits ratio shows the percentage of savings that has been transferred to private sector loans. At the same time, it should be borne in mind that deposits, as a rule, are not the only source of credit potential of banks and that loans are not the only asset in which banks invest.

Another efficiency indicator is the net interest margin, which represents the ratio of the bookkeeping value of net banking income from interest to the total assets of banks.

Figure 4 shows that at the beginning of the observed period, the highest value of the net interest margin was recorded in Bosnia and Herzegovina, while the lowest value was recorded in Albania. If the values of the net interest margin are averaged over the observed period, it is evident that it is a decreasing trend, which is certainly desirable in this case. During the observed period, the greatest increase in efficiency, which is reflected in the reduction of the net interest margin, occurred in Serbia and Montenegro. Also, in Figure 4, it can be seen that at the end of the observed period, in terms of interest margin, the banking sector is the most efficient in North Macedonia.

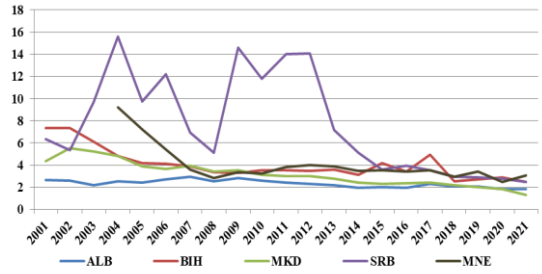
Figure 4. Tendency of movement of the net interest margin (%)



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

The next indicator represents the operating costs or the bank's operating costs, which refer to the share of the bookkeeping value of the bank's operating costs in total assets. This ratio is not affected by changes in interest rates and provides a more objective picture of the bank's efficiency in terms of how it manages its expenses compared to its assets. Therefore, this ratio helps to measure the efficiency of a bank or other financial institution at times when there are significant changes in interest rates or interest differences (Blatter & Fuster, 2022). Lower values of operating expenses, as in the case of net interest margin, indicate a higher level of banking efficiency. A higher level of assets is desirable, but not a higher level of operating expenses. Thus, a bank that regularly achieves a lower ratio of operating expenses to assets is better in terms of operational efficiency.

Figure 5. Dynamics of operating costs (% of total assets)



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

Figure 5 shows the ratio of operating expenses to total assets of banking sectors in the countries of the Western Balkans. During the observed period, Albania, North Macedonia and Bosnia and Herzegovina recorded a slightly decreasing trend, i.e. an improvement in efficiency, while in the case of Serbia, during the first half and middle of the period, a certain cyclical nature of the observed ratio was observed, after which it came to a significant decrease, i.e. to the increase in the efficiency of banks. When it comes to Montenegro, in the first half of the observed period, there is a significant improvement in the operational efficiency of the banking sector, and during the second half of the given period, it does not deviate significantly in relation to other observed countries.

3. STABILITY OF THE FINANCIAL SYSTEM

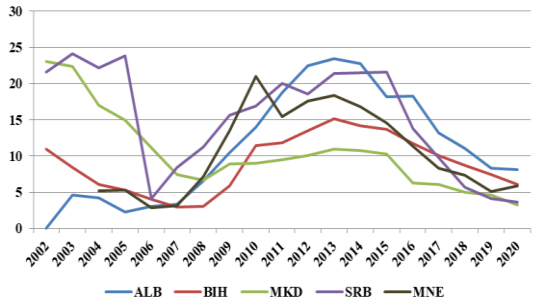
The relevance of financial stability analysis was first recognized at the time of the international financial crises at the end of the 90s of the last century, while it was further strengthened by the financial crisis that occurred in 2007. The magnitude itself and globality of its destabilizing effect, achieved through global banking, makes it the single most disruptive economic event since the Great Depression of the late 1920s/early 1930s (Gundbert, 2012).

The period of accelerated credit growth that preceded the global recession in 2007 was marked, among other things, by the underestimation of credit risk that arises as a result of the expansion of the client base and overestimation of their creditworthiness. (Živković, 2011). As shown in Figure 6, the problem of non-performing loans in the countries of the Western Balkans existed before the crisis. The specificity that can be seen in the picture is that at the beginning of the observed period, Serbia and North Macedonia had the largest share of non-performing loans in total loans compared to other countries. The causes of the growth of non-performing loans in Serbia are to a large extent found in the problems that existed in the pre-crisis period, which are probably related to institutional factors and the strong credit expansion that existed in that period (Tanasković & Jandrić, 2014).

Right before the beginning of the crisis, the rehabilitation of the banks' non-collectible claims took place (the share of non-collectible loans in all observed countries was below 10% in 2007 (Figure 6)). However, in the following year, the re-growth of non-performing loans begins and continues until 2013. After a short period of stagnation, this indicator of asset quality in the countries of the Western Balkans begins to decline from 2015, which lasts until the end of the observed period (with the exception of Montenegro, which records an increase in non-performing loans in 2021). The downward trend of non-performing loans is mainly the result of

systemic measures taken by central banks and other relevant institutions involved in solving the problem of non-performing loans.

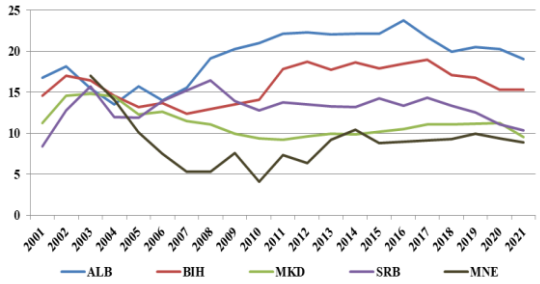
Figure 6. Non-performing loans (% of total loans)



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

One of the important indicators that reflects the degree of stability of banks is the z-score (Pham, Dao & Nguyen 2023; Hafeez, Li, Kabir & Tripe, 2022; Bouvatier, Lepetit, Rehault & Strobel, 2021). The popularity of the z-score stems from the fact that it is negatively correlated with the probability of insolvency of a financial institution, that is, the probability that the value of its assets will be lower than the value of its debt. Thus, a higher z-score value implies a lower probability of insolvency (Čihák et al., 2013). In some cases, the objectivity of this indicator is disputed since it is based on purely accounting data and there is a possibility that it may provide an unrealistically positive assessment of the stability of the banking sector.

Figure 7. Dynamics of z-score indicator



Source: Author, on the basis of: World Bank (2024), World Development Indicators Database, https://databank.worldbank.org/source/global-financial-development

Observing the values of the z-score indicator for the banking sectors of the Western Balkan countries, shown in Figure 7, it can be noted that the probability of solvency increased immediately before the 2007 crisis, and that after that there was an improvement in solvency. Also, it is noticeable that during the observed period, and especially in its second half, the highest degree of solvency, i.e. stability, was recorded by the banking sector in Albania, followed by Bosnia and Herzegovina and Serbia. North Macedonia and Montenegro remained at the bottom of the list.

3.1. CONCLUSION

The paper analyzes financial development indicators on the example of a group of five Western Balkan countries. For the purposes of the analysis, secondary data taken from the World Bank database for the period 2001–2021 were used.

Based on the dynamics of the considered indicators, first of all, their cyclical movement is observed, which is in accordance with the characteristics of reality and the dynamics of the overall economic activity in the observed period. In addition, it is not possible to single out a country that leads the way in all dimensions of financial development. What can be noted is that at the end compared to the beginning of the observed period, there was a significant growth in the size and activity of the banking sector, a slight improvement in efficiency and maintenance of financial stability in all five countries of the Western Balkans.

In order for the performance of the financial system to be comprehensive, it is necessary to analyze the indicators of the development of the capital market. Such an analysis was not feasible this time, given that there are no available comparable indicators of the development of the capital market in the countries of the Western Balkans in the World Bank database. Historically observed, the capital market, both in Serbia and in other Western Balkan countries, did not play a significant role in the financing of economic activity. Among other things, the socio-political order and the lack of an adequate institutional framework were the limiting factors of its development. The share markets in these countries are mostly small and illiquid, and therefore fall into the category of so-called marginal markets. In this regard, the development of the securities market is one of the necessary conditions that would improve the overall financial and economic development of the Western Balkans countries.

As for future research, the focus will remain on monitoring further trends in the size, activity, efficiency and stability of financial systems in the countries of the Western Balkans. One of the reasons is the fact that the continuation of the observed period was followed by the crisis caused by the COVID-19 pandemic and, in connection

with that, the need to consider its impact on financial development.

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Review Article

THE IMPACT OF THE NEW ECONOMIC REALITY ON WAGES AND INFLATION WITH REFERENCE TO SERBIA

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***Abstract**: Current events in the world, the most dangerous of which are the SMO in Ukraine and the war in the Middle East, are leading the world to a new economic reality and major changes. The conflict in Ukraine is essentially a conflict between Russia and the West, and a new international order is emerging in light of a growing Russian-Chinese axis facing a declining West. The recovery from the COVID-19 pandemic lost momentum in 2022, regardless of employment stabilization. The quality of jobs offered has improved in some dimensions, but real wages are falling significantly in almost all OECD countries despite an increase in nominal wage growth. But that's why in most of those countries, there was an increase in profits, often more than nominal wages. Nominal minimum wages try to keep pace with inflation, with the high risk that any real growth could quickly disappear if inflation remains high. The goal of the research is to present the situation in the global market, with special reference to the trend of wages and inflation in the EU, as well as the presentation of the situation in Serbia, according to the same parameters. The paper will use the deduction method. Materials from scientific journals and primary sources were used in the presented research, using the method of content analysis. An appropriate statistical regression method was applied. The hypothesis put forward in the paper is that the nominal increase in wages is a consequence of the inflation increase. It is expected that the research will confirm the hypothesis.*

***Key words**: global economy, GDP, debt, inflation, wages*

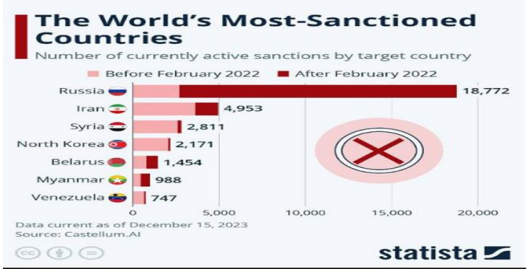
***JEL classification:** E2, E3*

1. INTRODUCTION

According to the Iranian Institute of International Studies (Therme, 2022), before the war in Ukraine (2022) and the US withdrawal from Afghanistan (August 2021), the dominant idea in Western strategic circles was based on the concept of a "rules-based international order", where the international order was based on the idea of one hegemon - the United States of America. The current situation in Ukraine is leading the world to a new reality and major changes, given that this conflict goes far beyond Ukraine, and essentially represents a conflict between Russia and the West. The New International Order of 2022 is taking on new contours in light of a growing Russian-Chinese axis facing a declining West. This decline will not be short-lived as the European continent will remain at war and subject to increasing fragmentation as long as the military confrontation in Ukraine continues. The members of the European Union (EU) do not agree on the idea of total separation of Russia from the West and the globalized international financial system based on the US dollar, considering that the exclusion of Russia from the global economy is not the same as the exclusion of Iran, Syria or North Korea. The EU's fear that sanctions against

Russia could have unintended consequences in the form of self-sanctioning of its economies proved to be justified. The biggest challenge facing the current sanctions regime is that it is supported by only a minority of countries around the world.

Table 1. Countries with the largest number of imposed sanctions



Source: Statista, 2023

The European refusal to use the ruble as a currency for trade (except for Hungary and Slovakia) carries with it a great political risk for accepting such a decision. If European countries accept the ruble to buy gas, it will mean opening a Pandora's box for other commodities such as fertilizers and oil, which is a significant step towards the de-dollarization of international trade. Sanctions against Russia threaten to undermine the US dollar's dominance, the IMF says (Financial Times, 2022).

Monetary policy struggles with curbing inflation, on the one hand, and the need to limit production losses, on the other. Unfortunately, much of the pressure on prices comes from forces outside the control of central banks, such as energy and food market shocks, as well as supply chain disruptions. Nonetheless, monetary policymakers must continue with a conservative policy of credit conditions to work to curb inflationary expectations and bring under control domestic drivers of inflation, such as wages and rents (Irtyshcheva, Kramarenko, and Sirenko, 2022).
Fiscal pressures will be far more present in countries that have opened their borders to refugees, such as Poland, which has received almost 3 million people, or Moldova, where the ratio of the number of refugees to the number of inhabitants is very high. This highlights the need to share humanitarian aid costs fairly among EU members (Insights & analysis on economics & finance, 2022).

The confrontation between the West and Russia, which has escalated to a great extent, forces company leaders, entrepreneurs, and policymakers to implement the long-term consequences of current hostilities in their business. It is already clear that this will have a long-term negative impact on most European companies and economies, which will result in a permanent restructuring of world trade (Prohorovs, 2022).

2. THE EUROPEAN CENTRAL BANK

A war in Ukraine will trigger a massive negative supply shock in the global economy (Roubini, 2022).

According to the European Central Bank, half of the recent rise in inflation has been driven by higher energy prices (ECB, 2022).

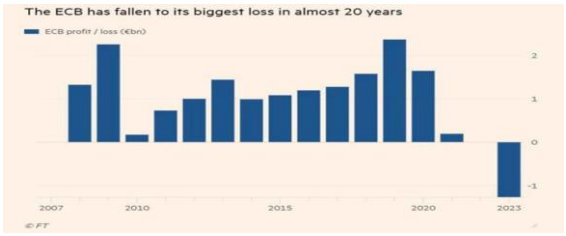
The war in Ukraine brought to the fore the dilemma faced by central banks on both sides of the Atlantic, namely, how quickly, comprehensively, and strongly to tighten financial conditions in an environment of inflation that can no longer be seen as only temporary and reversible. The challenge is all the greater because it is necessary not to reduce the pace of economic activity at the same time, without causing financial turmoil (Canuto, 2022).

Among the Eurozone countries, Estonia, Lithuania, the Czech Republic, and Latvia have significantly higher inflation rates than other EU countries. The ECB believes that the increased level of corporate debt dating back to the COVID-19 pandemic makes companies more sensitive to increased risks, higher interest rates, or falling profits. Therefore, worse balance sheets of companies represent a risk for banks (ECB, 2022). Both America and the Eurozone will face recession in 2022 and 2023 (McKinsey, 2022).

For the first time in its history, the European Central Bank is facing such a crisis and potential stagflation. If we look at what caused this crisis, it is clear that tightening policies will not reduce inflation. Likewise, additional stimulus will not be able to prevent an economic downturn, as it is caused by a lack of supply (RaboResearch 2022).

The European banking sector remains segmented along national lines. The crisis management framework for small and medium-sized banks is less robust than for larger banks, accompanied by prudential regulatory barriers to the single European banking market. Cross-border integration is progressing at a slow pace. In 2021, the amount of domestic assets was more than four times the amount of non-domestic assets in the Eurozone.

Graph 1. The biggest loss in the business of the ECB

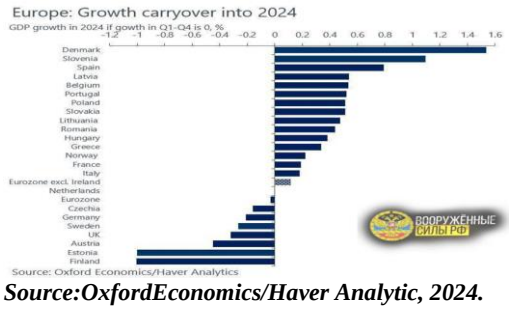


Source: Financial Times, 2024.

From a European perspective, the Russian SMO in Ukraine is the main cause of the potentially severe consequences of geopolitical disturbances. This was the reason, among other things, for the introduction of unprecedented economic and financial sanctions, such as the exclusion of Russian banks from SWIFT, the freezing of the country's financial assets (including central bank reserves), and the blocking of trade in key raw materials and agricultural products. The consequence of all this is that the EU was forced to try to drastically reduce its dependence on Russia, which was the main supplier of energy in the EU, with increased costs (ECB, 2023).

According to the assessment of the International Monetary Fund, the risks of the projection of global economic growth, for the first time in a long time, were assessed as symmetrical, whereby economic growth is estimated to be 3.1% this year, which is more favorable than the expectations from October. When it comes to economic activity in the eurozone, it practically stagnated in the second half of last year, which is why growth is forecast for this year to be slightly lower than three months ago, but still higher than in 2023 (NBS, 2023).

Graph 2. GDP in the EU in the first quarter of 2024.



Source:OxfordEconomics/Haver Analytic, 2024.

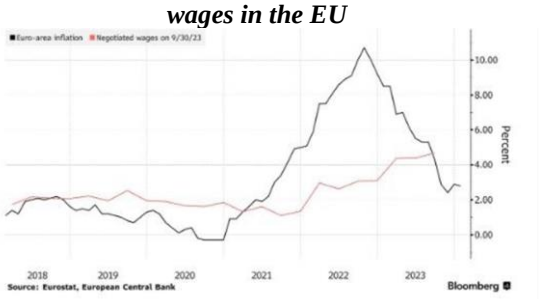
Interestingly, the countries that recorded a drop in GDP in the first quarter of 2024 are at the same time the loudest in their aggressive rhetoric concerning Russia.

2.1. INFLATION AND WAGES IN THE EU

The recovery from the COVID-19 pandemic lost momentum in 2022, related to employment and stabilization of unemployment. The energy shock caused by the Russian SMO in Ukraine has led to a halt in the growth of the global world and has affected the rise of price inflation in many countries to levels not seen in decades. Labor markets are still under severe pressure, despite signs of easing. From the aspect of the quality of the jobs offered, it can be said that the labor market has improved in some dimensions. However, real wages still record a significant decline in almost all OECD countries despite the increase in nominal wage growth. In parallel, there is a strong growth in profits, often more than nominal wages. In many countries, profit growth far exceeds labor costs, which puts additional pressure on domestic prices and causes them to rise, all of which results in a decline in the labor force's share. And while public transfers and fiscal support have provided some relief, the loss of purchasing power has proven particularly hard on low-income workers. Such households therefore face higher effective inflation rates because a greater part of their consumption goes to energy and food.

Nominal minimum wages try to keep pace with inflation, with the high risk that any real gains could quickly fade if inflation remains high. At the same time, wages resulting from negotiations, collective agreements between employers or employers' organizations and trade unions react with a certain delay even in countries where the majority of workers are covered by a collective agreement The role of collective bargaining, related to minimum wages, is to achieve a fair distribution of the costs of inflation between workers and employers, as well as among workers of different wage levels, to prevent further increases in inequality (OECD, 2023).

Graph 3. Trends in inflation and negotiated wages in the EU

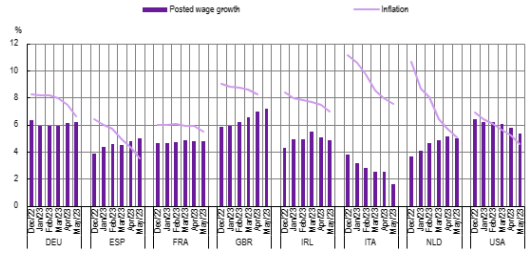


Sourse: Eurostat, EC,2023.

What is visible at first glance in **Graph 4**. is that inflation in all the countries shown exceeds

nominal wage growth. Observed by the months shown, inflation records a downward trend, while stable or declining nominal wage growth during the first five months of 2023 was recorded in Germany, France, Ireland, Italy, and the United States of America. It is also worth noting that in Spain, the Netherlands, and the United Kingdom, nominal wage growth increased slightly. In general, the gap between inflation and nominal wage growth has narrowed. However, real wage growth only turned positive in Spain and the United States last months. In Italy, the gap between inflation and wage growth widened again in May 2023, after falling in the first four months of the year.

Graph 4. The gap between inflation and nominal wages



Source: Economic Indicators (database), 2023.

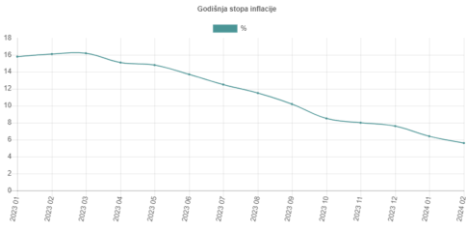
During the last quarter of 2023, global inflation continued to slow, as a result of tight monetary policy and lower food prices. The further speed of its slowdown will depend on the impact of geopolitical changes in the price of primary products. Although inflation in the eurozone increased in December, for the first time since April 2023 (to 2.9% year-on-year), this was expected in the conditions of a low base for energy prices, and the realized inflation growth was lower than expected. In January 2024, inflation in the eurozone, according to Eurostat's estimate, slightly decreased to 2.8%, and its continued slowdown is predicted both this year and in the next year, according to the assessment of the European Central Bank, 2025 it should be at the level of 2%. Nevertheless, inflationary pressures in the euro area are still elevated, primarily due to the strong growth of unit labor costs due to tight conditions in the labor market, but they will gradually decrease because, with the slowdown of inflation, the pressures on wage growth will also decrease. The cycle of increasing reference interest rates was mostly completed during 2023 (NBS, 2023).

3. INFLATION AND SALARIES IN SERBIA

The National Bank of Serbia has kept the reference interest rate at an unchanged high level of 6.5% in 2024 as well. With this, it confirmed its commitment to the further reduction of global inflationary pressures, as well as the continuity related to the downward trajectory of domestic inflation, with very optimistic goals that inflation will return to the targeted limits (3%) in the middle of the current year. Considering that in the previous period, the reference interest rate, and the mandatory reserves, it is to be expected that the effects of those measures will continue to be transmitted to inflation this year as well.

The greatest uncertainty related to the perception of the realization of inflation and gross domestic product in Serbia comes from the international environment, dominantly related to the further development of geopolitical relations, as well as global economic growth. Movements in world prices of energy, food, and other primary products remain key factors for inflationary dynamics. As for factors from the domestic environment, the most significant sources of risk are certainly the speed of recovery of domestic demand, which again depends on the level of foreign investment inflows, investments in infrastructure, and the energy sector. We can also consider the outcome of the agricultural season as a risk factor, which will primarily affect the price of fruits and vegetables.

Graph 5. Annual inflation rate in Serbia



Source: Republički zavod za statistiku, 2023.

The annual inflation rate is expressed through price changes in the current month compared to the same month of the previous year, in %. Consumer price indices have been used as an official measure of inflation since January 2009. Consumer price indices are defined as a measure of the average price change of a fixed basket of goods and services that households buy to satisfy their needs (Republički zavod za statistiku, 2023).

Table No. 2 presents the movement of the average consumer basket expressed in RSD dinars and average monthly net earnings (expressed in RSD dinars) per employee in Serbia, in the shown period, from 2019 to 2022. It is already visible at first glance that the height of the average consumer basket every year in the observed period is higher than the average monthly salary,

which already speaks volumes about the damaged standard and quality of life of the employed. The average monthly earnings trend shows no signs of recovery.

Table 2. Movement of the average consumer basket and average monthly net earnings per employee in Serbia (in RSD dinars)

Year	2019	2020	2021	2022
Av. Cons. basket	71.398	73.322	77.040	91.635
Av. wages	54.908	60.057	65.844	75.353

Source: Ministarstvo unutrašnje i spoljne trgovine, Republika Srbija, 2023

The hypothesis that is put forward in the paper is that the nominal increase in wages is a consequence of the increase in inflation.

Intending to test the hypothesis, based on the data listed in Table 2 in the observed time period Table 3 shows the results.

Table 3. Relationship between consumer basket and wages

Indicator	Wages			
	R^2	F	*t*	*p*
Consumer basket	0.954	41.282	15.823	<0.001

Source: Author's calculation

The authors have employed the SPSS statistical package for regression analysis to investigate the relationships between these two variables and predict the outcome based on observed data in Table 2. Through the analysis in SPSS, the hypothesis has been tested, generating insights concerning the outcome.

Regression was used to test whether consumer prices affect wages. Consumer prices as an independent variable were regressed on the dependent variable wages. Consumer prices predict wages $F(3, 1) = 41.282$, $p = <0.001$, indicating that consumer prices play a significant role in shaping wages. $R^2 = 0.954$ shows that the model explains 95,4% of wages.

CONCLUSION

From everything previously stated in the paper, we can conclude the following:

a) The SMO in Ukraine has turned into a confrontation between the West and Russia, and it is already possible to conclude that it will have comprehensive long-term consequences for the global economy and the business of countries

b) Changes in geopolitics will have a great impact on the banking and financial sphere, as well as on international trade. This further implies that there could be a permanent realignment of world trade: the global economy is becoming more regionalized – shorter supply chains with reliable partners.

c) As a result of the SMO in Ukraine, the confrontation between Russia and the EU will have long-term negative consequences for most European companies and economies.

First of all, there will be a decrease in the volume of sales, which in itself leads to a decrease in income. A significant drop in revenue, along with a significant increase in costs, will lead to a large reduction in profits and/or an increase in losses for many companies. A decrease in the profitability of the company will affect the increase in the interest rates of the central bank and, therefore, the increase in the price of credit resources.

Although during 2023, global inflation had a downward trajectory, which is a direct consequence of the reduction in global energy and food prices, but also due to weaker demand. Inflation in the service sector proved to be persistent, especially in developed countries, which is primarily a consequence of increased nominal wages due to the still tight labor market.

As for the demand in Serbia, the growth of nominal wages and pensions is expected to continue this year, but at a more moderate pace than last year, as inflation also has a slowing trend. Great support for the growth of consumer demand is also remittances from abroad, whose inflow is expected at a similar level as last year (5 billion euros). The gap between the average consumer prices and average wages per employee remains very pronounced, to the detriment of nominal wages.

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Review Article

TRENDS IN THE DEVELOPMENT OF FINANCIAL INNOVATIONS, DEREGULATION AND SELF-OVERSIGHT OF BANKS IN DEVELOPING COUNTRIES; THE EXAMPLE OF THE REPUBLIC OF SERBIA

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***Abstract**: The trend of development of financial innovations, deregulation and self-supervision of banks in developing countries, the example of the Republic of Serbia can be followed up on already developed attitudes that have evidently dominated the last 30 or so years in the world. Namely, the use of new financial products was largely disastrous for the world economic and financial order. Such an observation from the macro-economic aspect had a bad effect, first of all, on a large number of weak, underdeveloped economies, such as the Republic of Serbia. The influence of the leading dominant country in the world since the mid-1980s, the USA, has had a negative impact on the economic systems of transition countries. This primarily refers to the negative impact of uncontrolled money printing, which in turn had a fundamental impact on the initiation of a chain of speculative transactions in the USA and then on the rest of the world. In addition, in the attempt to regulate the monetary policy in the USA, another big mistake was made, which was reflected in the support of the so-called self-control of banks. This is how the reality emerged in the most powerful economy, which has achieved relatively relaxed legal regulations for the control of hedge funds, in the 90s of the 20th century, which resulted in the sudden enrichment of these funds.*

***Key words**: development, financial innovation, self-supervision of banks.*

***JEL classification:** E00, E16, E42, E58.*

1. INTRODUCTION

The trend of development of financial innovations should be seen as a constant in relation to the operations of both the banking system and the economy as a whole. Innovative approach within the banking system Innovative processes in banking business should essentially respect foreign direct investments. Foreign direct investments in recent decades essentially influence movements and can influence changes in the essence of both the domestic one and there are also significant influences on movements in the world financial market (Lutovac, 2024; Popović et al., 2015; Popović et al., 2018). In this way, banks are fundamentally faced with major changes both in relation to the positioning of the external environment and within the positioning of the internal environment. Therefore, innovation in finance should take into account the internal and external environmental factors of both banks and companies operating in one economy (Radović et al., 2021; Tomas-Miskin et al., 2022; Vitomir et al., 2020).

This is of great importance, especially in the observation, analysis and evaluation of weak economies, especially those that tend to follow the paths of economic and political integration, which is true for the Republic of Serbia.

The innovativeness of finance should include the observation and appreciation of general competitiveness, as for banks that have to achieve individual and general differentiation in the performance of banking operations and services that operate in business with the economy in relation to the already performed positioning of the competition. Innovation should also include the fact that banks have continuity in their work while retaining the existing and attracting a greater number of new and heterogeneous users and clients [9].

In this way, the observed banks in Serbia should build a system of differentiation based on significant comparative advantages in relation to the offering of banking services to target clients. However, the reality is that different banks in Serbia generally offer similar banking services to users of banking services, both in dealing with individuals and in dealing with the economy. In addition, the essential innovativeness of the banking system, viewed through the operations of banks, has the effect that realistically the vast majority of new banking services are offered on very similar terms on the domestic market, with a note that the offered banking services in relation to the international market often differ significantly in relation to the terms that provide on the domestic market of banking services. Such a realistic observation of banking services is of particular importance for business in the existence of transitional conditions where the real economy operates continuously on the banking market in Republic of Serbia with the general goal of improving banking conditions and becoming as favorable as possible in the longer period of business.

2. CONSTANT DEVELOPMENT OF FINANCIAL INNOVATIONS

The constant development of financial innovations of the banking system may have elements of innovation that will include:
1) understanding the business decisions of the bank's top management,
2) influence on effective decision-making by top management,
3) the impact of decisions on the creation of an efficient management team,
4) leadership, knowledge and ability of bank management,
5) bringing the essence of banking management closer to all interested parties
6) understanding the needs of clients for purchasing banking products
7) application of banking marketing in the promotion of banking services,
8) essential improvement of relations with clients.
The presentation of the general scheme of the movement of innovative banking is given in the presentation of figure 1.

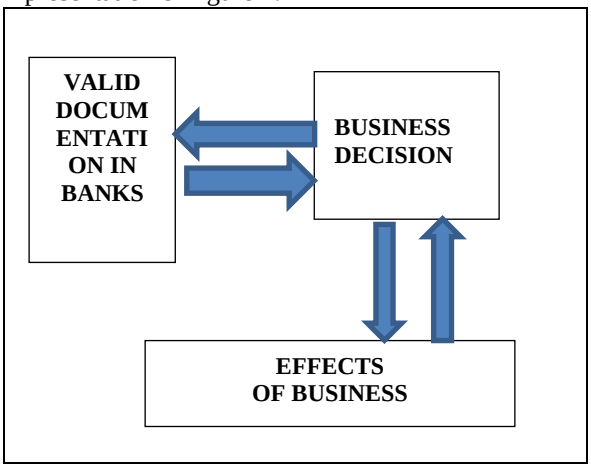

Figure 1. *Presentation of the general scheme of innovative banking.*

3. THE INFLUENCE OF MACROECONOMIC RELATIONS ON THE FUNCTIONING OF THE BANKING SYSTEM IN THE REPUBLIC OF SERBIA

The influence of macroeconomic relations on the functioning of the banking system is gaining importance. This can be seen especially after the last major global crisis. In the following, the authors gave a presentation of the economic effects in observing the functioning of the banking system, a snapshot is given in the presentation of Figure 2.

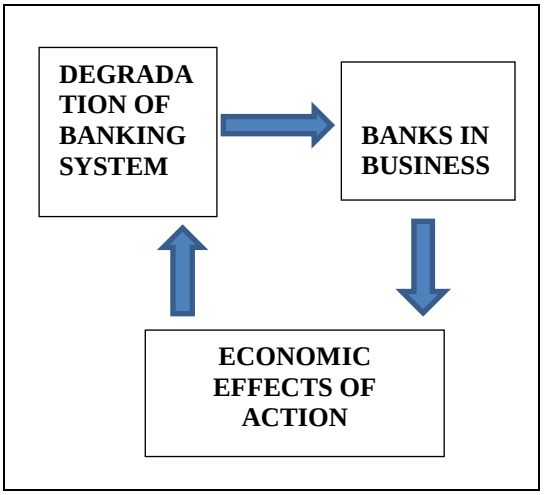

Figure 2. *Presentation of the flow of economic effects of the banking system.*

4. TRANSFORMATION OF THE BANKING SYSTEM

Transformation of the banking system, which essentially means that it is necessary to create an efficient and safe banking system that will include:
1. increasing the capital strength of banks,
2. improving the efficiency of banking institutions,
3. focusing on banks' liquidity, source structure and placement structure,
4. losing the strict division into investment and commercial banking,
5. strengthening measures to improve the solvency of banks,
6. cleaning the assets and liabilities of banks from unprofitable forms,
7. narrowing of rights based on bank deposit insurance,
8. increased control by central banks,
9. arrangement and cleaning of the banking system from inherited and accumulated losses and dubious, especially in transition economies.

In order for such a detailed observation of the transformation of the banking system to be possible, it is necessary to take into account the following important concepts that can essentially affect the development of the banking system.

The three key concepts that more closely describe modern banking strategy are:
- Asset and liability management of banks operating on a specific market,
- Risk management of bank operations in real time,
- Management of customer relations,
In addition,
1) it is necessary to develop good relations with: To the clients of the bank, With other banks, With business entities,
2) With state authorities,
3) With associations related to the implementation of financial activities of banks.

In the Republic of Serbia, the Law on Banks and the Decision on Bank Risk Management define the following types of risks to which the bank is exposed in its operations:
1. liquidity risk
2. credit risk, including residual risk, risk of reduced value of receivables, risk settlement/delivery, as well as the risk of the other contracted party,
3. interest rate risk,
4. foreign exchange risk and other market risks,
5. concentration risk, which especially includes the risks of the bank's exposure to one person or group of related persons,
6. the bank's investment risk,
7. risk related to the country of origin of the person to whom the bank is exposed (country risk),
8. operational risk, which especially includes legal risk,
9. compliance risk of the bank's operations, 10. strategic risk,
11. another risk.

In the following, the author presented the possible impact on the operations of banks.
Below is a presentation of banking operational observations in Figure 3.

In addition, the effects of the banking operating system are shown in Figure 4.

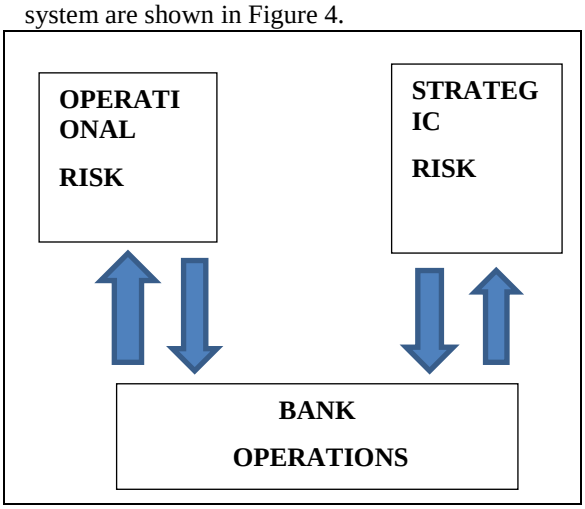

Figure 3. *Presentation of strategic and operational risks to bank operations.*

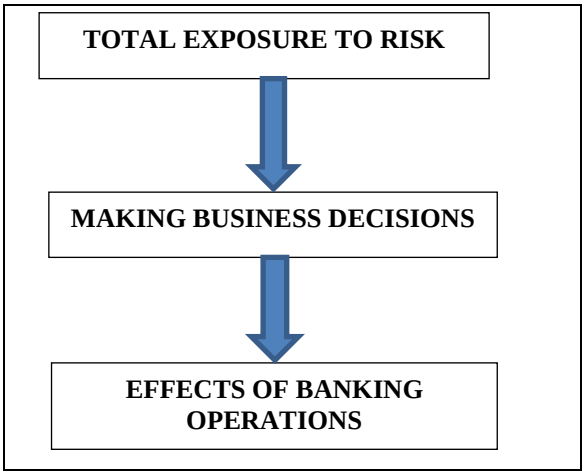

Figure 4. *Presentation of the impact of risk on management decision-making in the functioning of banks.*

Banking services have certain specificities, which could be reduced to the following:

• The subject of the service is money and its various forms (circular money, cash, securities, etc.).
• Due to intangibility, these services are provided in the form of contract elements, so in depending on the type and variations of the elements of the contract, the types of services also develop which are provided for investment and lending contain an element of time (maturity), where the customers of these services are faced with strictly determined, even compulsory deadlines, while the deals themselves are not concluded in one act.

Intangible and expressed in the elements of the contract, the character of banking services is required additional clarifications.

However, this requirement varies by species contract: opening a savings account requires simpler and shorter explanations but for example an investment study. Not only the provider but also the user of services in to this type of contractual relationship, they are referred to a relatively high level of expertise knowledge in the field of economics, especially monetary.

Innovative processes in banking business in relation to possible desired rapid growth refers to monitoring:
1) interest rates of commercial banks,
2) central bank interest rates, total offers of the banking system,
3) a measure to reduce risky placements,
4) use of information systems,
5) development of hardware that supports banking operations.

The top management in the work of financial and banking entities introduces internal auditing and internal control with the aim of improving general management decisions in their work, that is, their work can improve the security in the operations of the mentioned entities.

In addition, the management in the work of the banking sector aims to form internal control with the aim of increasing:
1) overall security of business decisions made.
2) overall transparency in work.
3) existence of the need for the association of several legal entities.
4) total evaluation of all factors that can affect the work of banking organizations.
5) overall improvement of operations with available funds.
6) overall compliance with all previously adopted policies in the work of the mentioned entities.
7) overall evaluation of business risks.
8) overall evaluation of already adopted controls.
9) supervision and monitoring of all processes in the work of sports organizations.

Therefore, all management decisions made in this way are safer and the management has greater confidence in such business, which is of great importance for the real functioning of the social community through the use of the work of the banking sector.

In addition, the management of banks introduces the essential connection of internal control with other internal control mechanisms through:
1) cooperation of the mentioned controls within the existing accounting.
2) cooperation with external auditing.
3) cooperation with other important entities.
4) raising the general level of control in the functioning of the mentioned entities.
5) appreciating the existence of differences between work and functioning between banking organizations in relation to the criterion of their size.

CONCLUSION

In the modern banking system and the management of banks and the banking system, the management of the bank's top management means the appreciation of strategic planning, which requires innovative approaches that are a means of positioning the bank in a certain economy.

Therefore, innovation means that the competitive market environment and the search for the best model for strengthening one's market position in the future period should be seen as a goal that will be achieved primarily within a specific commercial bank.

Another segment to pay attention to is the study of strategic risk. It should include numerous opportunities related to the assessment of the strategic development of a specific commercial bank. The goal of such activities would be to monitor the costs of banks' operations in an innovative way, but which will also be transferred to numerous companies.

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Review Article

THE IMPORTANCE OF REGIONAL POLICY OF THE EUROPEAN UNION FOR THE DEVELOPMENT OF TOURISM IN BOSNIA AND HERZEGOVINA

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***Abstract**: Despite numerous anthropogenic and natural advantages, the development of tourism in Bosnia and Herzegovina (BH) is very slow. The specificity of the state organization in terms of the two-entity division significantly contributes to the slowing down of the progress of Bosnia and Herzegovina in the field of tourism. In addition to the slower implementation of institutional and legal provisions, the tourism sector faces a significant lack of financial resources that, if used adequately, would significantly improve the destination's competitive position. In accordance with the European determination, various forms of financing initiated by the European Union (EU) are available to Bosnia and Herzegovina.*
The subject of this paper is the analysis of funds that are available to Bosnia and Herzegovina through various programs and forms of cross-border cooperation. The main goal of this analysis is to point out the missing funds in the national framework and the importance of the networking process with the region. In addition, the paper provides a comparative analysis of two program periods of EU regional policy, 2014-2020. and 2021-2027. years. In accordance with the subject and goal of the research, careful methodological settings result in concluding considerations, which are listed in a separate part of the paper.

***Key words:** tourism, Bosnia and Herzegovina, regional policy, European Union*

***JEL classification:** Z3, R11, O52*

1. BASIC INDICATIONS OF REGIONAL TOURISM POLICY IN EU

The development of the EU's regional policy is even linked to the establishment of the European Community and the creation of a common market, when the Union was finding new methods to reduce the gap in development and legal adaptation of the countries that joined the community[8]. Regional inequalities were the key threat to the creation of a single European market (Vojnović, 2008, p. 368). The regional policy of the EU represents the basic instrument of the Union, which strives to achieve the equality of economic and social development of the member countries. Although it was originally intended only for member states, the scope of its activities has expanded so that certain programs help both candidate and potential candidate countries. Especially in the regional context, the cohesion policy through which tourism played a strategic role in reducing regional differences is significant (Brandano and Crociata, 2023, p. 764). Certain scientific works indicate that domestic tourism is a more significant instrument for strengthening regional territorial cohesion, especially for less developed regions (Rodriguez, Olmo and Jurado,

[8] Already in the period of the Treaty of Rome (1957), the first steps towards regional solidarity were taken. Namely, the preamble of the Treaty of Rome emphasizes "that the member states of the Economic Community should strive to reduce the differences that exist in the degree of development of certain regions and the backwardness of less privileged regions".

2021, p. 1320). Some authors believe that the European Union, as a creator, expected too much from regional policy: reducing inequality between regions, increasing efficiency at the national and European levels, and reducing inequality between countries (Martin, 1999, p.14). On the other hand, some authors scientifically proved the effectiveness of EU regional policy. In support of the fact that most of the projects implemented through regional policy create positive effects on the economic growth of the recipient regions, it can be stated: expenses through EU structural and cohesion funds caused positive average effects on the growth of income per capita in sub-national regions that lagged behind the EU average. In addition, more costs generally did not produce proportionally larger effects (Becker, Egler and Ehrlich, 2018, p.144). Practice has so far shown that the effects of regional policy are significantly lower where institutions are corrupt and where human capital is incompetent. It is important to point out that the EU mandates respect for the principle of subsidiarity in the context of regional policy, which is synonymous with national sovereignty and implies that the Union acts only when it is considered that actions at its level will be more effective than at the national level. In this sense, national tourism organizations gain freedom (Spicker, 1991, p.3). In most of the policies implemented within the European Union countries, the national authorities had authority in terms of decision-making and institutional reorganization, tourism policy was formed gradually, through three phases. First, in the 1980s, the European Community adopted documents that partially solve tourism issues, so that such initiatives would result in a joint action plan for member states that was aimed at intensifying the exchange of tourist information and raising the quality of services in tourism, affirming village and rural tourism, protecting from unfair competition and the like. The second phase of the development of European tourism policy begins with the ratification of the Maastricht Agreement, which proclaimed the importance of tourism for the national economies of the member states, employment, regional revitalization of rural areas, strengthening of the social-cultural process, etc. The second phase of the development of European tourism policy was marked by numerous programs - Philoxenia, Cards, Sapard, Culture 2000 and others. The establishment of the Stabilization and Association Process in 2000 is of special importance for Bosnia and Herzegovina from this second phase. European tourism policy was officially institutionalized by Article 6 of the Treaty of Lisbon, emphasizing the need for regional cooperation and the importance of information exchange (Estol, Camilleri and Font, 2018, p. 426). The Lisbon Treaty of 2007 established a policy that explicitly addressed the tourism sector (Estol and Font, 2015, p. 427). The third phase of the development of European tourism policy continues today. Through this phase, the Union has created the conditions for a discussion on the official implementation of tourism policies for countries with the status of potential candidates for membership. The EU approaches the tourism sector in a holistic way, taking into account that all actors have aligned goals. The objectives of tourism policy in the third stage of development are focused on attracting more tourists with higher consumption, improving the quality of services, reducing seasonality while applying the postulate of sustainable tourism (Akehurst, Bland and Nevin, 1993, p. 43). In particular, competitiveness in terms of improving the image and profile of European tourist destinations should be singled out as a goal. This is only possible if those destinations also have a quality environment (Cismaru and Ispas, 2015, p. 87). These goals of improving the tourist market are also implemented in pre-accession aid programs for countries that do not yet have member status.

2. REGIONAL POLICY INSTRUMENTS WITH A FOCUS ON THE PRE-ACCESSION COUNTRIES

There are various forms of aid for the development and legal and economic adjustment of countries that are not yet members of the EU. Some of them are classic financial institutions that play the role of lenders, while others are exclusively instruments of regional policy. EBRD, EIB and CEB can be singled out as significant financial institutions. The European Bank for Reconstruction and Development - EBRD, in which Bosnia and Herzegovina has been a member since 1996. The areas that the EBRD covers with its investments are: agribusiness, capital market, financial institutions, information and communication technologies, legal reforms, communal infrastructure, natural resources, nuclear safety, energy, real estate and tourism. So far, the EBRD has facilitated a total of 222 projects in Bosnia and Herzegovina, some of which indirectly strengthen the tourism sector. EIB - European Investment Bank which, in cooperation with the European Investment Fund, provides significant funds for small and medium-sized enterprises in various sectors, including indirectly tourism. So far, about 58 different projects in Bosnia and Herzegovina have been financed on this basis. It is also important to mention the European Central Bank - CEB as a multilateral bank that mostly plays the role of a lender for various sectors (small and medium-

sized enterprises, public administration, higher education, etc.) The following are the main instruments of fiscal regional policy: the European Regional Development Fund - ERDF, the European Social Fund - ESF and the European Cohesion Fund - EKF. Together with the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF), they form the European Structural and Cohesion Funds (ESI). The ERDF, ESF and EKF funds are intended for the implementation of cohesion policy, with the first two referring to assistance to all EU regions, while the Cohesion Fund is intended only for less developed regions. A special form of assistance is provided for rural and coastal areas through the remaining two funds. The main goals of these funds are: convergence, regional competitiveness and employment, and territorial cooperation (Mirić, 2009, p. 36). The largest part of the support is directed to the member states, i.e. their regions whose GDP is below 75% of the average GDP of the European Union. The funds are intended for EU member countries, their regions and transnational Euroregions. Countries in the status of potential candidates and candidates for EU membership do not have the right to use funds from structural and cohesion funds.

2.1. PRE-ACCESSION AID PROGRAMS - IPA I, II AND III

So far, IPA programs have been implemented through three phases, with the third one underway. The first phase of IPA pre-accession assistance refers to the period from 2007-2013. year and was created with the aim of facilitating the process of accession of EU countries. In accordance with its status, Bosnia and Herzegovina was entitled to funds from the first two components, while countries with candidate status could use funds from all five components. The activities financed from the second component had special importance for tourism.

Table 1. IPA pre- accession programs

	IPA I 2007-2013.	**IPA II 2014-2020.**	**IPA III 2021-2027.**
Key components	Transition assistance and institution building Cross-border cooperation Regional development Development of human resources Rural development	Democracy and governance Rule of law and fundamental rights Competitiveness and innovation Education, employment and social policies Agriculture and rural development Environment and energy	Rule of law and democracy Good governance, alignment with the acquis, Green agenda and sustainable connectivity Competitiveness and growth Territorial and cross-border cooperation
Funds for Bosnia and Herzegovina (million euros)	517,805,176	539.6*	According to the achieved progress
Total funds for all states	9,467.188.992	10,683.5	14,162.5

Source: based on data available at: https://archive.europa.ba/?page_id=44274

In the period 2014-2020. In 2008, a new IPA II pre-accession aid instrument was created, which differs from the previous IPA due to the emphasized strategic focus of the documents accompanying the IPA II component, which integrate the development reform agendas of the countries. It was created by a new regulation in 2014 that introduces policy areas, to which potential candidate countries are also entitled, and not just candidates as before. The third pre-accession aid package IPA III differs from the previous two because the regulations stipulate that the allocation of total funds is not based on pre-defined criteria per country, but according to the degree of progress achieved by the beneficiary countries.

3. SIGNIFICANCE OF THE TERRITORIAL COOPERATION PROGRAM FOR TOURISM IN BOSNIA AND HERZEGOVINA

The improvement of regional competitiveness in BH tourism is carried out through cross-border and territorial cooperation programs, which function within the framework of the IPA program, whose third program package IPA III is currently being implemented. Very often,

investments in the tourism sector are not direct through priority axes, but by investing in other thematic priorities spillover effects are achieved. Bosnia and Herzegovina participates in a total of 6 programs of territorial cooperation that ensure the strengthening of coordination in the cross-border, transnational and inter-regional domain. For each of the programs, a comparative analysis will be made that includes 2014-2020. program period and current from 2021-2027. years.

Interreg IPA cross-border cooperation program Croatia- Bosnia and Herzegovina-Montenegro 2014-2020. is a program that was created as a continuation of bilateral programs (Croatia-Montenegro, Croatia-BH) that were modified into a trilateral one between Croatia-Bosnia and Herzegovina-Montenegro that unites the cross-border cooperation of all three countries. The program includes 12 counties on the territory of Croatia, 109 municipalities on the territory of BH and 10 municipalities on the territory of Montenegro. Croatia carries the most significant part of the activity with regard to its tourism industry - about 25% of GDP generation, with over 94 million tourist overnight stays in 2019. Bosnia and Herzegovina is also on an upward trajectory in tourism, whose total contribution to GDP is around 10.2%. The importance of tourism in Montenegro, which has 4 cultural properties under the protection of UNESCO, is unquestionable. Tourism generates about 24% of Montenegrin GDP.

Table 2. Interreg IPA cross-border cooperation program CRO-BH-MNE

Priorty	2014-2020.	millions euros	2021-2027.	millions euros
1	Health and social protection	8.573.297	Smart investments in research, innovation and competitive entrepreneurship	23.540.000
2	Environmental Protection	14.288.830	Green investments in environmental protection, circular economy	46.010.000
3	Development of tourism	17.146.595	Accessible and resilient health services	19.250.000
4	Strengthening competitive.	11.431.063	Sustainable and inclusive tourism and culture	18.187.000
Total		51,439.785*		106.987.000*

Source: based on the data available at http://www.interreg-hr-ba-me2014-2020.eu/cooperation-programme/programme-facts

The amounts in the table are of an informative nature and have been increased for state support, which is binding as a form of co-financing. Program in the period 2014-2020. In two calls for applications, it included around 59 projects with over 249 partners.

The BH-Montenegro cross-border cooperation program is an instrument for easier rapprochement with the EU, reducing the regional and administrative differences that exist in two neighboring countries: Bosnia and Herzegovina and Montenegro. So far, it has been implemented in two project periods, and the third one is underway. The general program goal refers to the sustainable development of the cross-border area, and it is also aimed at achieving the goals of "sustainable, inclusive, integrated and smart growth", as well as economic, social and territorial cohesion. The third priority axis refers to the affirmation of tourism, and the promotion and improvement of cultural and natural heritage, and the funds for this axis in the amount of 85% are financed by the EU, which is approximately EUR 2,964,705.88. The program is implemented in 56 municipalities in BiH and 14 municipalities in Montenegro. For the program period 2021.-2027. approximately the same funds are foreseen in the amount of about 8,400,000 million euros.

Table 3. BH-MNE Cross-Border Cooperation Program 2014-2020.(million €)

Thematic priorities	IPA II CBC Bosnia and Herzegovina - Montenegro 2014-2020			
	Union support	State support	Total funding	% EU
TP1: Promotion of employment, social and cultural inclusion across the border;	2 100 000.00	370 588.23	2 470 588.23	85%
TP2: Environmental protection, promotion of climate change mitigation, management;	2 940 000.00	518 823.53	3 458 823.53	85%
TP3: Encouraging tourism, cultural and natural heritage.	2 520 000.00	444 705.88	2 964 705.88	85%
Total:	8 400 000.00	1 334 117.64	9 734 117.64	

Source: based on the data available at **https://ec.europa.eu/neighbourhood-enlargement/instruments/funding-by-country/bosnia-herzegovina_en**

The *Serbia-BH* cross-border cooperation program is a cross-border cooperation program dating from the 2007.-2013. budget period and continued in the period 2014.-2020. years. The program aims to increase the competitiveness of cross-border areas, and create social and economic cohesion through activities that improve physical, business, and institutional infrastructure. The table below shows the indicative financial allocation of funds by priority areas for the period 2014.-2020.

Table 4. SRB-BH cross-border cooperation program 2014-2020. (million euros)

Thematic priorities (tp)	IPA II CBC Bosnia and Herzegovina – Serbia 2014-2020			
	Union support	State support	Total funding	% EU
TP1: Promotion of employment, labor mobility and social and cultural inclusion	3 500000,00	617 647.06	4 117 647.06	85%
TP2: Environmental protection, promotion of climate change adaptation and mitigation, risk management;	4 900000.00	864 705.88	5 764 705.88	85%
TP3: Encouraging tourism, cultural and natural heritage.	4 200000.00	741 176.47	4 941 176.47	85%
TP4: Technical assistance	1 400000.00	0.00	1 400 000.00	100%
Total:	14 000000.00	2 223529.41	16 223 529.41	

Source: based on the data available at **http://srb-bih.org/en/sample-page/teorija-obuhvacena-programom/**

The continuation of cross-border cooperation between Serbia and Bosnia and Herzegovina is supported through two thematic priorities in the program period 2021-2027. years: T1- Investing in youth, education and skills and T2- Encouraging tourism, cultural and natural heritage. Thematic priorities have defined specific goals, expected results and indicative lists of activities. The total planned investments by the Union are 14,000,000 euros.

Table 5. BH-SRB cross-border cooperation projects that are ongoing, in the field of tourism

Project name	Total value of the project (€)
Developing rural tourism as a basis for the future sustainable development of the cross-border area of Serbia and Bosnia and Herzegovina	339,971.00
New locations for outdoor recreation in order to improve the quality of the tourist product - Open Air Everywhere	394.082,03
Experience the Roman heritage on the Drina and the Sava - the Route of the Roman Emperors	382,926.25
Eco tourism in the cross-border area of Serbia-BiH - Bird watching across the border	209,847.46
Via Dinarica: The green path beyond borders	337,555.55
Together for cultural tourism - Cross-border cooperation for the improvement of socio-economic development and the preservation of traditional handicrafts	322,205.89

Source: based on the data available at https://srb-bih.org/ba/bosnian-baza-projekta/

The *Adriatic Ionian Transnational Cooperation Program* (Interreg ADRION) was created as a form of transnational cooperation between a number of countries surrounding the Adriatic and Ionian Seas. A total of 8 countries participated in the ADRION program: Croatia, Greece, Italy, Slovenia and non-members of the EU-BH, Serbia, Albania and Montenegro. Projects are financed from the ERDF (European Regional Development Fund) for member countries and from the IPA (Instrument for Pre-Accession Assistance) for non-member countries, while part of the budget is also national co-financing.

Table 6. Adriatic-Ionian Program 2014-2020. (millions of euros)

ADRION	ERDF	IPA	State support	Total
Priority Zone 1: A smart region	16.693.547	2.998.111	3.475.815	23.167.473
Priority Zone 2: Greener and climatic region	38.395.155	7.077.221	8.024.538	53.496.914
Priority zone 3: Connection	15.024.191	2.684.333	3.125.034	20.833.558
Total	70.112.893	12.759.665	14.625.387	97.497.945

Source: based on the data available at https://www.adrioninterreg.eu/index.php/library/programme-document/

The mentioned total investments are increased for the fourth priority zone - Support for the implementation of the EUSAIR strategy for the fifth zone - Technical assistance, so that the total budget for the program period for all countries amounts to 118 million euros.

Table 7. List of approved projects with partners from Bosnia and Herzegovina, in the period 2014-2020.

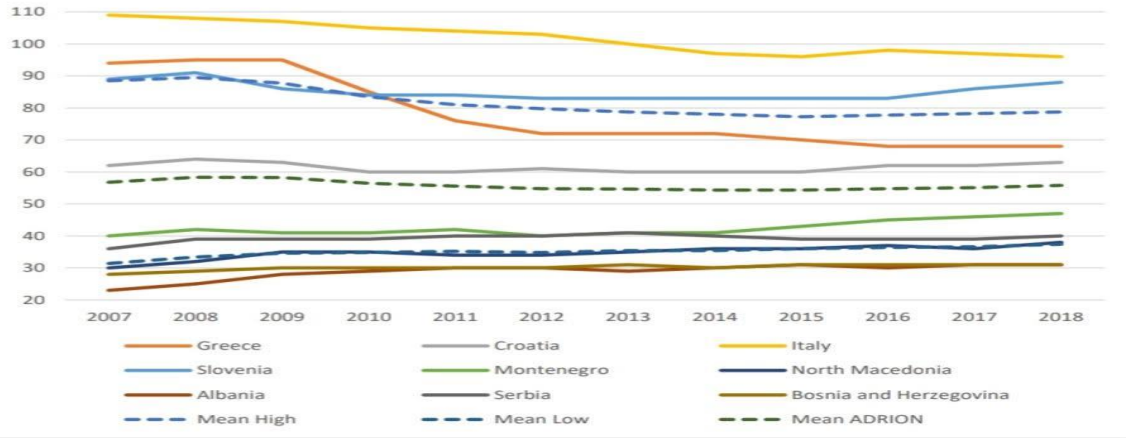
Call for projects	Total budget for partners from Bosnia and Herzegovina - million euros
First call	1.297.007,011
Second call	153.225,00
Third call	554.738,00
fourth call	73.651,00
Fifth call	355.732,50

Source: based on the data available at https://www.dei.gov.ba/hr/interreg-jadransko-jonski-program-transnacionalne-suradnje-adrion

When it comes to this program for the period 2021-2027. year, the focus of the program was placed on countering the negative effects caused by the COVID pandemic, especially in the tourism sector, in which the number of tourist arrivals dropped by as much as 73% (IPA Adrion, p. 11). As many as 72 places of world cultural heritage recognized by UNESCO are located in the countries covered by the program. The estimated budget of the IPA Adrion program is EUR 160

million, with a note that the list of countries has been modified for the 2021.-2027. program period. Countries are categorized into three categories - high-income EU countries (Italy, Greece, Slovenia), middle-income countries (Croatia) and countries with low per capita income (Albania, Bosnia and Herzegovina, North Macedonia, Montenegro and Serbia). The graph shows the fluctuation in terms of realized GDP, according to the development of the country. For example, Croatia's GDP makes up about 60% of GDP per capita in the EU27, while the same indicator for BH makes up only about 30% compared to the EU27.

Chart 1. GDP per capita for countries participating in IPA Adria 2021-2027. years



Source: based on the data available at https://www.adrioninterreg.eu/wp-content/uploads/2020/09/ADRION-territorial-analysis-post-2020-Appendix-final-approved.pdf

Transnational cooperation program Interreg Danube 2014.-2020. (Danube program) is a transnational cooperation program created with the aim of reducing the differences between the countries that geographically belong to the area of the Danube basin and the mountainous area of the Carpathians, the Balkans and part of the Alps. This program has the largest number of participating countries, a total of 14 countries: 9 EU members, 3 IPA countries and two ENI partner countries. Beneficiaries are all stakeholders and organizations that can benefit from the program, universities, non-governmental organizations, media houses, relevant authorities operating in the respective priority zones.

Priority	**Budget by zone**	**Total budget**	
		a) EU support	**b) State support**
Priority zone 1 Innovative and responsible business.	75. 980 561 €	ERDF: 202 095 405,00 €	42 653 480,00 €
Priority zone 2 Culture and environment	86 834 927 €	IPA II: 19 829 192,00 €	
Priority zone 3 Connectivity and energy responsibility	56 985 422 €	ENI: 10 000 000,00 €	
Priority zone 4 Good governance	35 276 689 €	Total EU: 231 924 597,00 €	
		Total a) + b)=	274 578 077,00 €

Source: basede on the data available at: http://www.interreg-danube.eu/about-dtp/programme-presentation

Table 8. Danube program 2014.-2020. total budget (millions of euros)

Observed by invitations, in the first invitation for the delivery of projects in Bosnia and Herzegovina the total budget was 2,895,064.59 euros, in the second 1,068,853.50 euros, while in the third invitation the budget was 1,688,321.76 euros, in total (IPA + co-financing). Almost all projects are closely related to tourism, and we can single out: FostIno, InnoXenia, Begin, Adrion 5 senses, Smart Heritrage, CCI4tourism, Creatures, Adriaticaves Plus and many others. Investing in other projects brings benefits for the tourism sector as well, in terms of greater mobility,

infrastructural equipment, and cultural, archaeological and landscape promotion. Program period 2021.-2027. of this project has a budget of around EUR 215,047,857.00.

Transnational cooperation program Interreg Mediterranean is a positive practice of territorial cooperation in the area of 14 countries and 64 regions of the Mediterranean. Program period 2021-2027. year is supported by a total budget of around 294 million euros, which is placed through three priority axes: Smarter Mediterranean, Greener Mediterranean, Management of the Mediterranean. The program is closely related to the preservation and valorization of cultural heritage, the promotion of green zones, the creation of sustainable tourism and numerous activities in the domain of maritime tourism. Essentially, the goal of this program is to significantly improve the Mediterranean region, which shows a lower average GDP per capita, a lower employment rate and a lower innovation index than the EU average.

CONCLUSION

The implementation of regional policy is controlled by the EU institutions, with the key role played by the European Commission, which approves funding programs for member states and compiles a cohesive report on the implementation of funded programs every third year. For the purposes of comparing regions and easier monitoring of regional development, a hierarchical system for the classification of spatial units in the member states of the European Union (NUTS) was designed. For regions that do not have EU membership, there is support in legislative adjustment and strengthening of institutional capacities and creation of a more competitive economy, through programs of territorial and cross-border cooperation. With the aim of allocation, redistribution and stabilization of pre-accession regions, the program is available to many countries, including Bosnia and Herzegovina, through various thematic priorities.
The special importance of these programs for Bosnia and Herzegovina is the multidimensionality of investments, which cover different spheres of business or legislation. When it comes specifically to tourism, it is not possible to specify the funds invested in that sector, because by investing in other sectors there is a spillover of economic effects that can often be greater than the specific investment. Of particular importance are the third program packages related to the period 2021.-2027. year, because they significantly mitigate the negative effects of the Covid-19 pandemic, which were particularly pronounced in the tourism sector. Covid brought a drop in direct contribution to GDP to tourism in BH from 2.5 to 1.5%, a drop in income by more than 50%, as well as a drop in bookings at the global level by more than 70%. Through the programs, special focus is placed on strengthening cultural integrity, a greener and more connected region, and decarbonization.

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Review Article

THE IMPACT OF DIGITAL COMMERCE ON ECONOMIC, ENVIRONMENTAL AND SOCIAL SUSTAINABILITY

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Abstract: *Globalization is a process that is closely related to the development of new technologies that open the possibility for new types of business. There is a dynamic development of business, new ones types of trade, which raises the question of its impact on environment. With the development of new business business formats of trade - electronic trade the attention of marketing-management more and more also occupy additional questions, such as: how develop the concept of sustainable development on the basis balanced goals (economic, environmental and ethical). Social responsibility comes to the fore business, marketing-management strategy trading company created on the platform environmental awareness, taking into account the impact business on sustainable development, on the one hand, and impact novelties that technology brings with it (scientific technical progress), on man, on the other hand. For a more objective view of the impact of digital innovations on the development of society as a whole is necessary look at the effects that ensure how personal existence as well as social reproduction consumer, a key stakeholder in the marketing trade strategy and society as a whole. It requires it increasingly intensive involvement of consumers in creation marketing-management of trade strategies in under the conditions of the "new-digital-Web/Internet" economy. In this way, they are enabled to choose and create e-purchase and delivery options products, which leads to the development of competitive recognition and sustainability of electronic commerce. Bearing in mind the facts-trends presented above to the development of trade on the information platform communication technologies (ICT), research the niche of the (co)author of this paper will be directed in the direction analysis of interdependence (of the new "triangle"), between trade, ICT and sustainable business. All more turbulent modern environment leads to the issue of survival and further development of humanity, a the need for business in accordance with the goals sustainable development.*

Key words: *digitization, trade, electronic business, internet, "new" economy, society 5.0, shadows of the digital age/commerce, sustainably business, ecology/economics/ethics.*

JEL classification: *O13, K56, K57*

1. INTRODUCTION

In recent decades, trade has undergone a true revolution. As a result, there is the discovery of electronic commerce, which today represents the most represented form of commerce. Its rapid development was noted especially after the pandemic caused by the Kovid19 virus. Use of online communications, mobile devices, social networks, etc. it changed the business models of retailers forever and it changed customer behavior forever. Considering the achievements achieved and sales increasing every day, questions began to be raised about the impact of this way of selling on the environment, although from the beginning it was believed that e-commerce on the Internet was more environmentally friendly than traditional commerce. It is undeniable that digital technologies have led to the reengineering of the marketing management of trade companies, both from the aspect of the entire supply chain and their communication, with various stakeholders, where the honorable place belongs to consumers.

However, this is only one side of the "coin" of digital technologies/digital innovations in commerce. For a more objective view of the impact of digital novelties on the development of society as a whole, it is necessary to look at the effects that ensure both personal existence and social reproduction of the consumer, a key stakeholder in the marketing strategy of trade and society as a whole. This requires an increasingly intensive involvement of consumers in the creation of a marketing-management strategy for trade in the conditions of the "new-digital-Web/Internet" economy. In this way, they are enabled to choose and create e-options for the purchase and delivery of products, which leads to the development of competitive recognition and sustainability of e-commerce.

The strengthening of the advantages of electronic compared to traditional trade in terms of effects on the environment should certainly be influenced more and more by the perceptions and behavior of e-customers themselves. It is encouraging that consumers are becoming more and more aware and that they are beginning to give more attention and trust to traders who carry out their logistics and other activities with a high level of environmental awareness. "Digital natives" of the Y generation (millennials) are very confident when using information and communication technologies. They generally believe that e-commerce is more environmentally friendly than traditional brick-and-mortar stores. They understand the importance and want information about the environmental impact of their purchases. They are ready to choose the option of waiting longer for product delivery if it means "more ecological" delivery. Even more, they believe that this option should be defined as a regular option, and that if they want faster and "less ecological" delivery, they should pay extra for it. (Brunetti et al. 2018) Electronic retailers are often virtual organizations that represent a new form of organizational structure, in which modern digital technologies are predominantly used to connect people, communicate, but also perform tasks. (Džafić et al., 2020)

Bearing in mind the above-mentioned facts-trends in the development of trade on the platform of information and communication technologies (ICT), the research niche of the (co)author of this paper will be directed towards the analysis of interdependence (the new "triangle") between trade, ICT and sustainable business. The work structure conceived in this way will also open up new questions - a new paradigm: the triumph of innovations brought by ICT, Industry 4.0, artificial intelligence, the "fight" between robots and employees in trade (man)... A new model of digital toralitarianism is born, where ICT has power over socio-economic development. The increasingly turbulent modern environment calls into question the survival and further development of humanity, and the need for business in accordance with the goals of sustainable development. (Digitalization in general, with special reference to trade, imposes the question; is it heaven or "hell" with the poppy of "man"?)

2. INTENSIVE DEVELOPMENT OF DIGITAL TRADE

After the conditions were created for the transition from the mechanical to the electronic phase of development, the development of the digital economy, the emergence of electronic commerce and electronic marketing, market-developed countries stepped into a new technological cycle, better known as Industry 4.0. In this cycle, the Internet represents a phase of development and provides new opportunities for the development of electronic commerce. Industry 4.0. as a new industrial revolution, it enabled the automation and development of trade in terms of technology and organization. There is a turning point in the factors of competitiveness. A resource-driven economy is giving way to an economy driven by knowledge, innovation and information. Knowledge and new ideas that lead to technological changes, on the one hand, and sustainable growth, on the other, are coming to the fore. Digital transformation is the process of introducing digital technologies into all segments of life and business. With the development and application of the Internet, the way to a digital economy is opening, which permeates all aspects of the global economy and refers to an economy based on digital technologies and communication networks. The use of the Internet leads to the reengineering of the entire supply chain, the development of new business formats for trade in goods, services and capital. It is produced and traded without the business partners even seeing each other. The way to a new concept is opening, the concept of virtual (electronic) business, electronic commerce, virtual supply chain.

The digital economy refers to the economy based on digital technologies, including digital communication networks (Internet, intranets and private value-added networks), computers, software and other related information technologies (Turban et al 2004). Internet sales is a form of electronic commerce where buyers and sellers come into contact through an electronic communication channel, using a global computer network for the exchange of goods and services

and payment. It is now fully identified with e-commerce due to its predominant participation. Electronic ie. Internet trade is one of the channels of traffic that has been developing irresistibly and intensively since its inception, and gained a particularly strong momentum with the onset of the Covid pandemic in 2019 and 2020. (Ilić et al., 2020)

A digital transformation strategy has four main areas: (Singh, 2020)

1) attract the attention of consumers,
2) transform products from traditional to digital,
3) optimize operations in order to reduce costs and achieve higher revenues and profits, i
4) empower employees with new knowledge and skills

One of the most represented forms of trade in the digital transformation is electronic trade, which was created precisely on the basis of the development of information and communication technologies and electronics, when a path was created for the development of the digital economy, which provides the basis for the creation of electronic trade. Electronic commerce has evolved in its development, with the development of satellite and cable television, micro-electronics and the application of information and communication systems, until the development of the Internet, which leads to the creation of new trade institutions. Electronic trade as a synonym for Internet trade is closely related to other scientific disciplines such as: business informatics, distributed marketing, electronic business, electronic marketing.

3. INTERDEPENDENCE BETWEEN TRADE, ICT AND SUSTAINABLE BUSINESS

Information and communication technology has encouraged the emergence of truly new scientific knowledge and traditional interpretation. The effects of ICT on the models of traditional economic systems have led us to the formation of the digital economy. Significant changes in production processes and the rise of Industry 4.0 have also affected goods and services and their global distribution, the system has also changed a lot to meet the demands, and the economic system has become complex and needs to be integrated. New technological innovations have revolutionized the economy. which, in addition to general disruption, produced exponential growth and essentially structural changes. Products and services are beginning to make great leaps in their development through innovation. Industry 4.0 is a term that denotes the integration of new management and automation methods based largely on advanced applications of information technology, new materials, biomimetics and intelligent robots. Advanced techniques and technologies increase productivity by reducing the number of employed workers and the market price of products.

The term Industry 4.0, or the digital transformation of the fourth generation industry, is more recent and was first used in public discourse a few years ago, during the Hanover Technology Fair in 2011. On that occasion, the Industry 4.0 platform was launched from the highest level, and in 2012, at the suggestion of the German Federal Ministry of Education and Research, a scientific-industrial consortium was formed, which published an introduction strategy with clear recommendations to the German government, but also to the business world, "while eight priorities, i.e. key areas on which the concept of Industry 4.0 is based, are listed: (Kagermann, Wahlster, Helbig 2013:6-7)

- Reference architecture and standardization - imply the connection and integration of a certain number of companies through a value network and business partnership, which will be sustainable only if a set of common standards is established, while the reference architecture will provide a technical description of those common standards and thus facilitate their implementation;
- Management of complex systems - production systems and the products of their operation are becoming more and more complex, as a result of which this requires adequate planning and technical-technological equipment of production engineers, both with methods and tools necessary for the development of those models;
- Comprehensive broadband industrial infrastructure – comprehensive, high-quality and reliable broadband network communications are a key requirement for Industry 4.0;
- Security and protection are critical to the success of smart manufacturing systems. It is important to ensure that facilities, production and products are not dangerous, neither for people nor their environment, while at the same time production facilities and products that integrate data and information must be subject to protection against misuse and unauthorized access;

- Organization and design of work - in smart factories, the role of employees will change significantly, primarily due to the existence of control in a real time frame, which as such tends to transform work content, work processes and work environment;
- Training and permanent professional development - Industry 4.0 will drastically change the very principle of engaging workers and their competence, as a result of which it will be necessary to implement an appropriate strategy of training and organizing work in a way that encourages learning and enables a lifelong cycle of training through learning;
- Regulatory framework - the existing legislation must be adapted to the market situation and the competition, first by taking into account business innovations due to the protection of business data, and then also the issues of responsibility related to them. In addition, the regulation must take into account issues related to the handling of personal data, issues related to trade.

New business models are being developed based on Industry 4.0. The characteristics of such business models are: mass production in the short term, linking of production capacities and fragmentation of the value chain. All this leads to the fact that there are no more boundaries between participants in the production and provision of services and users of products and services, which leads to the creation of new markets (Valenduc & Vendramin, 2016). Therefore, Industry 4.0 connected robotics and electronic business in a very successful way, which formed the "smart factory".

According to McKinsey, nearly 3,000 employees said the strongest motivations for adopting a sustainable mindset are: alignment with company goals, missions or values; building, maintaining or improving reputation; meeting customer expectations; and developing new growth opportunities (Spilakos, 2018).. Apart from financial and business results, the impact on the environment is important regardless of the size of the company. SMEs contribute 64% of environmental impact in the EU (Blundell et al., 2013). Therefore, SMEs could similarly improve their own environmental performance and demonstrate their significant power as drivers of industry change (Seidel et al., 2008).

Sustainable development and digitization affect how an organization adapts and runs its business. it seems that embracing digitization and transforming business organizations that integrate new technologies have become key elements for business survival. However, Čudanov et al. (2012) showed that the distribution of ICT application in Serbian companies has the properties of Pareto's law. These authors analyzed 67 selected companies in Serbia and obtained results according to which the application of ICT in Serbian companies is insufficiently developed. However, today most companies cannot be imagined without the application of new technologies in business. It is these technologies that bring changes in strategy and structure. Therefore, it is necessary to manage new technologies and operations in order to improve business performance. Traditional practice is being extended by sustainable practice. Participants have a direct or indirect impact on sustainable business. Government has a key role as it sets laws, rules, standards and guidelines to create a framework for sustainable development. Only synergy between governments, companies, consumers and financial markets can bring sustainability to business practices. Governments should establish and enforce regulations on sustainability, while companies and consumers should support investments, products and services in sustainability (Jednak & Jednak, 2019)

4. CHALLENGES OF DIGITAL TRADE WITH ASPECT OF SUSTAINABLE DEVELOPMENT

In the literature in the field of environmental protection, the concept of sustainable development appeared in the seventies of the last century, and from then until today it has constantly attracted the attention of a large number of researchers (Jones et al 2011). The concept of sustainability arose as an alternative to the practice of the economic system in the middle of the 20th century, which generated growth that, although intended for man, at the same time began to threaten him. Very simply, "sustainable development" is the concept of economic development with minimal use of non-renewable natural resources, and maximum use of renewable energy resources, so that future generations will be able to enjoy the benefits of a preserved environment. (Vujović et al. 2012) Speaking of sustainable development as a kind of science about complex systems, economist Radovan Pejanović (Pejanović, 2015) indicates that sustainable development "has become a way of thinking, i.e. world view, focused on the interconnectedness of economic, social and environmental changes and a way to realize our common aspiration for a decent life, which would

include world peace, economic development, social inclusion and environmental sustainability." Requirements for the preservation of unchanged natural and environmental conditions are relatively recent. They were created when it was noticed that rapid technological progress, which is undeniably a step higher compared to the previous one, also has a negative side that endangers man and his environment. The requirements for the preservation of the human environment are taken care of by institutions at the state level and these requirements appear in the form of laws, standards and regulations harmonized at the national and international level, which companies must fulfill, whether they are engaged in production or trade (Ćuzović, Ivanović, 2010). .

The boom in the digital economy, e-commerce, has created serious challenges and raised concerns about the impact on the environment. Many believe that overall, buying and selling this way has a positive impact on the environment. First of all, it is believed that in this way, since no customer goes to the store, the emission of harmful gases is reduced and contributes to the creation of the greenhouse effect. Furthermore, it is considered that the absence of traditional "brick and mortar" sales facilities also contributes to a positive impact, in the sense that energy consumption and other negative impacts on the environment are reduced. However, the reality is much more complex. Electronic commerce is not without negative impacts on the environment. In the modern markets of developed countries, consumers are becoming more and more aware and concerned about the preservation of the environment and the consequences of their actions. At the same time, they are starting to put pressure on production and trading companies to correct their behavior towards a higher level of sustainability. Customers want the highest possible level of shopping convenience and security and rarely criticize "excessive" packaging, even though all those packaging materials are simply thrown away without much thought.

The concept of sustainable development in trade can be seen through the following attributes (Yudelson, 2010): green sales facilities, green processes, green transport, green product, green price, green technology, green shipping, employment, earnings, better working conditions for employees, continuous improvement employee knowledge, innovation, development of the brand of organic products, management of relations with consumers, reduction of environmental costs (water, air, energy) and the like.

At the moment, the highest level of awareness and concern, in addition to the issue of transportation, exists in the matter of waste from the packaging of products that are delivered by the seller to the customer via postal and courier services. A typical e-commerce shipment may use up to seven types of packaging materials: paper receipts, envelopes, cardboard boxes, plastic bags, woven bags, tapes, and "pad" materials (bubble wrap, Styrofoam). (Chueamuangphan et al., 2019)

In order to reduce the negative effects of electronic commerce on the environment, first of all, it is necessary that electronic merchants sell products and services that have the least possible environmental impact. When it comes to packaging, it is primarily necessary to use recycled cardboard and packaging paper (bags) in order to eliminate plastic in this step. In this sense, effective guidelines and policies to avoid excessive use of packaging materials are very useful. Furthermore, 3D printing represents a field that needs to be perfected in terms of the possibility of printing packaging. Such packaging would better follow the shape and size of the product and would require less material. Production would be cleaner, with less CO2 emissions, more efficient and cheaper. (Escursell et al., 2020)

Logistics includes all activities that move products from the place of production to delivery to the end customer. These activities include warehousing and inventory management, sales, and especially transportation. Because customers demand delivery as quickly as possible (often within 24 hours), sellers use faster, more expensive delivery methods, harming the environment. In addition, the requirement to deliver goods directly to the doorstep will lead to a more pronounced negative impact on e-commerce. In door-to-door delivery, delivery vehicles travel long kilometers, consume more energy and emit more harmful gases. Traditional trade and shopping in stores, on the other hand, require transportation efforts and costs from the buyer in addition to those from the supplier. Customers of course have to go to the store to buy and take the product with them, which in itself has negative consequences. Clearly, we need to research and compare the shipping costs, profitability and environmental impact of one purchasing method versus another. Existing research shows that consumers are more inclined to shop in retail stores when they are at a certain distance from the point of sale, and as the distance between consumers increases, preferences will shift to electronic shopping. Gathering knowledge on these issues and creating management models will help environmental policy makers and traders themselves. Moreover, more aware consumers will

make more rational choices because it is certainly in their interest. Regarding shipping, the question of "undelivered" goods is also interesting when the address is free when the goods arrive or when the customer needs to be physically present to receive the goods. The percentage of undelivered goods is increasing due to the increasing number of single households and households in which both partners are employed.

When it comes to transportation, the proposal is to use electric and hybrid vehicles or biogas, which would reduce the negative impact on the environment and the emission of CO2 into the atmosphere. In addition, route planning software makes a huge contribution to defining the most efficient routes that reduce driving time, save money and, of course, reduce the negative impact on the environment. In this sense, it is worth mentioning the technologically successful development of package delivery by drone. Greater use of drones to deliver smaller packages could reduce the need for vehicles and trucks. Drones use batteries and therefore will not cause as much pollution as delivery vehicles.. It will also require a change in the form of packaging and the use of new, lighter, sustainable materials. In addition, many other technological solutions are being developed to improve the shipping and delivery process. One of them is a system consisting of special electronic locks and surveillance cameras (Amazon) that allows the delivery person to enter the apartment independently and leave the product.

Environmental problems become a challenge to trade management, putting in the foreground activities aimed at achieving eco-satisfaction of consumers. The value for the consumer is not only the functional and structural determinants of the qualitative design of the "offer package" (assortment), as well as the quality of service. The customer's value of products and services from the offered range extends to the area of eco-quality. This means that the customer's concept of the value of the "offer package" of the trading company implies the unity of the quality of the assortment from the aspect of technical-technological determinants (defined by the ISO 9000 standard) and environmental (defined by the ISO 14000 standard), with the quality of service as an additional marketing instrument. According to this understanding, ecology becomes not only the norm for achieving the customer's value of the product range in terms of eco-quality, but also the cultural pattern of behavior of ecologically educated citizens, entrepreneurs and managers. Ecological rationality, as can be seen, has recently become an important instrument in the marketing strategy of a trading company (Ćuzović, Sokolov-Mladenović, 2013).

CONCLUSION

Digital technology rules the world. The specter of technicalism-digital totalitarianism is spreading. Technology changes the existing image of man - transforms him into a new being - a Super "god" who is capable of controlling the entire universe. Information-communication-technologies (ICT) have become a tool in drawing the maps of the new cadastral survey of the earthly empire, on the one hand, and, on the other hand, the architects of the global and regional reshaping of cyberspace. On stage is a kind of competition of promoters of a new digital society in which artificial intelligence and supercomputers threaten to enslave human beings, placing them in virtual dungeons - where their life, at first glance, looks like they are in paradise, the so-called digital "civilization".

The boom in the digital economy, e-commerce, has created serious challenges and raised concerns about the impact on the environment. Sustainable development and digitization affect how an organization adapts and runs its business. it seems that embracing digitization and transforming business organizations that integrate new technologies have become key elements for business survival. It is believed that by means of digital commerce, since no customer goes to the store, the emission of harmful gases is reduced and contributes to the creation of the greenhouse effect. Also, it is considered that the absence of traditional "brick and mortar" sales facilities also contributes to a positive impact, in the sense that energy consumption and other negative impacts on the environment are reduced. However, the reality is much more complex. Electronic commerce is not without negative impacts on the environment. Environmental problems become a challenge to trade management, putting in the foreground activities aimed at achieving eco-satisfaction of consumers. When talking about sustainable development, in addition to the economic and environmental components, the social or social component is the third pillar of sustainability. However, with the use of modern technology, it seems that humans as a social being have become isolated from nature and all the benefits it provides. Although humans are part of nature and the universe, we are still just a speck of dust in the universe. On the one hand, the accelerated development of science and technology brings enormous benefits, but on the other hand, it can also lead to self-destruction! Modern civilization must learn to reconcile, that is, to balance its possibilities and desires, the

possibilities of its natural environment and its own capacity of consciousness.

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Review Article

INDUSTRIAL POLICY FOR THE NEW GLOBAL ECONOMY

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***Abstract**: Exceptional global changes in the last few years have led to the emergence of a new economic reality that shapes all parts of the economy and society. The latest technological and global trends have led to a strong increase in the importance of industrial policy. The Fourth industrial revolution, globalization and human capital are the main drivers of today's economic development. Environmental, digital and social transitions shape new types of jobs, services and business models. The changing geopolitical environment greatly affects the industry. The confluence of the COVID-19 pandemic and the Russian-Ukrainian conflict ultimately marked a turning point for the global economy as these key events laid bare economic vulnerability and at the same time made global political tensions worse. Global market competition, protectionism, market disruptions and trade tensions are increasing challenges. Their combined influence gives a new direction to the development of industrial policy and encourages the formation of a system of public instruments to support priority industrial areas. Policymakers in developing economies are increasingly adopting green industrial policies based on the production of green technologies and services. The main goal of the research in this paper is to identify the key features of the new reality that determine the necessity of industrial policy's approach to new trends. Understanding the major changes in the economic environment will help countries and businesses navigate global economic uncertainty with active industrial policies.*

***Key words**: industrial policy, economic development, globalisation, new economic reality.*

***JEL classification:** L520*

1. INTRODUCTION

After the world economic crisis of 2008, the global economy experienced significant changes. Increasing trade conflicts and protectionism have emerged as a result of the changing global economic balance. The confluence of the COVID-19 pandemic and the conflict in Ukraine are key events that have exposed economic vulnerability while greatly exacerbating existing geopolitical tensions. This has led to changes in global trade and dominant investments in safe investments. The conflict between Russia and Ukraine has had a major impact on the movement of goods and people, on the global supply chain, increasing costs, as well as product shortages that have led to food shortages around the world. In addition, the war in Ukraine has not only led to an unprecedented economic separation between the Group of Seven (G7) and Russia, but has further exacerbated existing tensions between the US and China, significantly raising the risk to global supply chains and production networks. Amid new economic and geopolitical realities, new strategies are needed to mitigate growing risks and take advantage of emerging opportunities.

As a result of these growing geopolitical tensions, countries and businesses around the world are intensifying efforts to reduce economic

dependencies and eliminate concentrated supply chains, often along emerging geopolitical blocs. Policies to reduce occasional globalization shocks, which are focused on security and resilience rather than efficiency, come with significant risks of fragmenting the global economy. Furthermore, it signals a shift away from liberal economic policies towards increasing government intervention, potentially resulting in weakened global growth. The movement of people, goods and information accelerated by globalization has shaped new economic conditions to which all national economies and governments must adapt in order to achieve economic growth. There was a need for proactive government policies that would overcome the problems and simply improve the economy. Industrial policy has risen to the top of the national agenda in advanced industrial economies. This represents a radical departure from recent economic history and reignites a debate that was waged more than 30 years ago. One of the lessons of the global financial crisis was that countries with a higher share of industry in their GDP were less affected by the crisis. An industrial renaissance began. This, at the same time, changed the discourse of industrial policy. After the long dominance of the laissez-faire approach, economists again began to deal with selective industrial policies. However, this debate is not just a revival of old concepts about the specifics of sectoral industrial policy or a lesson to be learned from the experience of Asian countries (the East Asian miracle). One significant difference is that industrial policy is now being aligned and facing new global challenges. The most prominent example of this new trend is green industrial policy.

The first part of the paper is dedicated to identifying threats and opportunities in the new economic reality. The second part of the paper deals with the role of industrial policy in the economy. Concluding remarks are given in the last part of the work.

2. NEW ECONOMIC REALITY: IDENTIFYING RESTRICTIONS AND POSSIBILITIES

2.1. RESTRICTIONS

Extraordinary global disruptions in the last few years have led to a new economic reality that shapes today's national economies and business results. The global economy is entering a period of slower growth and high inflation, while energy pressures, the rising cost of capital, an unstable labor market, geopolitical risks and the consequences of globalization contribute to greater challenges and uncertainties.

Slower economic growth and rising inflation are key features of global short- and medium-term economic forecasts. Global GDP growth is projected to remain subdued in 2023 and 2024 at 3% and 2.7%, respectively, constrained by the tightening of macroeconomic policies needed to contain inflation (OECD, 2023).

In 2023, the global economy grew at a rate of 3% in real terms, which is among the lowest rates since 1993, if we exclude the recession years of 2009 and 2020. Inflation is expected to decrease to 5.8% in 2024. year, and to 4.4% in 2025, but will remain far higher than the historical trend (4.1% on average during 2010-2020) (IMF, 2024).

In 2024, global real GDP growth is expected to be 3.1% (IMF, 2024). This slowdown is the result of high interest rates, rising business costs and global spending. Nevertheless, predictions are that the global economy will experience a gradual normalization of economic conditions, especially in the second half of 2024, with expectations of further easing of inflation and the conduct of a restrictive monetary policy. This will accelerate growth until 2025, when global growth is forecast to rise to 3.2% (IMF, 2024).

Annual GDP growth in the United States is forecast by the OECD to slow from 2.2% in 2023 to 1.3% in 2024, as tighter financial conditions ease demand pressures. In the Eurozone, where demand is already subdued, GDP growth is forecast to increase from 0.6% in 2023 to 1.1% in 2024 as the negative impact of high inflation on real incomes weakens. Growth in China will be constrained by reduced domestic demand and structural changes in the housing market, and will decrease from 5.1% in 2023 to 4.6% in 2024. (OECD, 2023).

The OECD forecasts that inflation will gradually ease through 2024, but will remain above central bank targets in most economies. Inflation in G20 economies is expected to decrease to 4.8% in 2024, while core inflation in G20 advanced economies is expected to decrease to 2.8% in 2024. Monetary policy should remain restrictive until there are clear signs that underlying inflationary pressures have been permanently reduced.

Manufacturing growth around the world has been hit by slowing growth in China. This permanent slowdown in growth was conditioned by a series of crises. More than fifteen years have passed since the beginning of the global financial crisis, but it is still reflected in the policy choices made

by advanced economies. The corona virus pandemic and the quarantine that followed are an additional cause of the increase in the level of public debt and a reversal in global development.

Geopolitical tensions and conflicts have reshaped the international order, which is increasingly multipolar, with far-reaching implications for technology, economic growth and development. These developments pose serious long-term dangers for humanity. Governments are facing growing fiscal pressures due to rising debt and increased defense spending. However, concerns about economic security should not prevent us from taking advantage of opportunities to reduce trade barriers, especially in service sectors.

The short-term challenge for policymakers is to successfully manage the reduction of inflation to the set target, gradually adjusting monetary policy to a less restrictive stance. At the same time, in many cases, they will have to absorb the effects of fiscal tightening, a renewed focus on fiscal consolidation to restore budgetary capacity to face future shocks, increase revenue for new spending priorities, and curb the growth of public debt.

Targeted and carefully timed structural reforms would strengthen productivity growth and debt sustainability and accelerate convergence towards higher income levels. More effective multilateral coordination is needed to resolve debt, create space for necessary investments, and mitigate the effects of climate change (OECD, 2023).

2.2. POSSIBILITIES

The key topics at the annual meeting of the World Economic Forum in Davos, which was held from January 15 to 19, 2024, were "Achieving security and cooperation in a divided world", "Creating growth and jobs for a new era", "Artificial intelligence as a driving force for the economy and society" and "Long-term strategy for climate, nature and energy". "Creating growth and jobs for a new era" was one of the key themes (WEF, 2024).

The meeting provided a platform for the dialogue, research and collaboration needed to avoid a decade of low growth and put people at the center of a more prosperous trajectory. Putting people at the center of a more prosperous growth trajectory, providing economic opportunity and meeting climate goals as well as the UN's Sustainable Development Goals requires investment, which in turn requires a strong global economy (WEF, 2024).

Amid continued economic uncertainty and geopolitical instability, global growth – as measured by gross domestic product (GDP) – has been slower than in previous years.

For the first time this year, the report introduces a Framework for the Future of Growth, structured around four key pillars, to underline the fact that GDP as a metric does not indicate the quality of that growth and its impact on the health of people and the planet.

The Growth Futures 2024 report introduces a multidimensional framework for assessing the quality of economic growth in 107 countries around the world. It characterizes a nation's economic growth through four dimensions: innovativeness, inclusiveness, sustainability and resilience (WEF, 2024b).

One of the conclusions of the forum was that in the new economic reality, a simple "return" to GDP growth is not enough, but instead, each country must take a unique and complex path towards achieving innovative, inclusive, sustainable and resilient growth.

As the report states, the key question is how future growth can be better aligned with other important priorities.

In graph 1, we see that the world is only halfway to innovative, inclusive, sustainable and resilient growth.

Graph 1. Global findings of the Future of Growth Report World average score across four dimensions (0-100 scale)

Source: World Economic Forum (2024a). Growth and Jobs at Davos 2024: What to know. WEF.

The forecast of the World Economic Forum's chief economists gives a divided picture for the coming year. Slightly more than half of the chief economists polled (56%) expect the global economy to weaken, and slightly less than half of those polled (43%) foresee unchanged or tougher conditions. The Forum's Global Risks Report 2024 reveals that "a lack of economic opportunity" is ranked as one of the top ten risks over the next two years. In the long term, barriers to economic mobility could grow (World Economic Forum, 2024a).

At the same time, artificial intelligence is having an impact on jobs. An International Monetary Fund (IMF) staff discussion note, Gen-AI: Artificial Intelligence and the Future of Work, reveals that nearly 40% of employees globally are exposed to the impact of artificial intelligence, while in advanced economies that share is 60% of employees (Cazzaniga et al. 2024). College-educated workers and women are more exposed to the impact of artificial intelligence, but they are still more likely to take advantage of its benefits first. At the same time, the increase in productivity could stimulate the growth of wages.

3. THE ROLE OF INDUSTRIAL POLICY IN THE ECONOMY

More recently, there has been a revival of the role played by industrial policy, partly due to the international financial and economic crisis of 2008, partly as a response to structural adjustment processes resulting from the impact of rapid international economic integration. Development literature that deals with the successes and failures of various forms of state intervention and business-government relations observed in developing countries has contributed to this.

After the 2008 crisis and the failure of the free market, there is a widespread re-examination of the importance of industrial policy. In developing market economies, extensive public policies were at the root of industrialization. The experience of conducting industrial policy shows that in most cases, it is difficult to assess whether government policies have been effective in achieving certain outcomes. The dilemma has long been present, would even better results be achieved with a more active industrial policy? (Lutovac Đaković and Medan, 2021).

Andreoni and Chang (Andreoni, Chang, 2019) and Rodrik (Rodrik, 2008) have given convincing arguments in favor of conducting industrial policy. Cimoli, Dosi, and Stiglitz (Cimoli et al, 2009) discussed the importance of industrial policy for developing economies. Industrial and innovation policy, as well as industrial policy in Europe, were dealt with by Pianta (Pianta, 2014), Foster MacGregor (2013) and Aiginger (Aiginger, 2014). Mazzucato (Mazzucato, 2013) emphasized the need for a broad role of "transformative" public action in innovation and industrial change. The role of green industrial policy for accelerating structural changes towards rich green economies was pointed out by Rodrik, Altenburg (Rodrik and Altenburg, 2017).

Based on the debate in the literature, there are five main reasons for the development of a new industrial policy, especially in Europe.

The first is rooted in macroeconomics. Getting out of the current stagnation requires a significant increase in demand, which could arise as a result of public investment. The second reason is related to the changes in the economic structure that are the result of the crisis. The biggest losses occur in "problem" industries. Economic activities that could offer new jobs are needed, while the bloated financial sector should be reduced.

The new industrial policy should encourage the rise of new ecologically sustainable economic activities such as: environmental protection, sustainable transport, energy efficiency and renewable energy sources, dissemination of knowledge, application of ICT and web-based activities, as well as health, population welfare and care activities. All these activities will create jobs that require a high degree of qualifications, but the wages for these jobs will be above average.

Third, a new industrial policy is needed in order for public enterprises to start activities that are unprofitable and therefore unattractive to private investors. There is a need for significant public sector action in setting priorities, investing and creating jobs. Public action could support the organization of new markets, development of competences and entrepreneurship, access to capital, dissemination of knowledge, environmental protection, well-being, social integration and territorial cohesion. The new industrial policy should reverse the situation that arose as a result of mass privatizations in previous years.

The fourth reason for the new industrial policy is related to the regional dimension. A growing gap is emerging within Europe and across the world, which is becoming multipolar. Fifth, a new industrial policy could be the main tool to address the urgent need for environmental transformation.

Making advanced economies sustainable is a transformation that concerns the entire economy and the entire society. Reducing the use of non-renewable resources, developing renewable energy sources and energy efficiency, protecting ecological systems, reducing carbon dioxide and greenhouse gas emissions, reducing waste and recycling are not only environmentally, but also socially acceptable new activities.

A combination of direct public action to provide environmental services and appropriate regulations for private activities is needed, including environmental protection, taxation, incentives, public procurement and the organization of new markets. A new industrial policy could provide a framework for the integration of different instruments of all policies that are needed for sustainable economic development (Pianta, 2015).

Industrial policy has come into disrepute since the 1980s mainly on the basis of two arguments.

First, governments were considered to have no more information than actors in the private sector about the direction in which structural change should be encouraged.

Second, the industrial policy measures used could be subject to lobbying and rent-seeking behavior of economic subjects. "Rent-seeking" or "rent-seeking" is the use of the resources of a company, organization, or individual to obtain economic gain from others, without reciprocal benefits to society through wealth creation.

An example of "rent enjoyment" is when a company lobbies for subsidies, grants or customs protections. These activities do not create any benefit for society, but only redistribute resources from taxpayers to the company (Lutovac, 2020). Partly for the purpose of recognizing the danger of "rent-seeking", the trend in the new industrial policy is to abandon traditional forms based on subsidies and turn towards a "soft" industrial policy based on a facilitating, coordinating role, in accordance with a systemic approach. Government failures are more common in developing countries due to the weaker capacity of governments to design and implement industrial policy (Lutovac, 2020).

A different perspective on industrial policy is needed today, one that focuses on activities to end the depression, finance the necessary public investment and restore sustainable economic activity. Part of the decision on the future development of the industry must be returned to public ownership. The new generation of industrial policies must overcome the limitations and failures of the past, such as collusion between political and economic powerhouses, excessive bureaucracy, lack of accountability and lack of entrepreneurs.

Decision-making mechanisms should be creative, with priority criteria for the use of public resources that include various social interests and are open to the voices of civil society and trade unions.

The general principles of industrial policy are simple. They should favor the evolution of knowledge, technology and economic activity in directions that improve economic performance, social conditions and environmental sustainability, as well as favor activities and industrial sectors characterized by learning processes (individuals and in organizations), rapid technological changes and strong growth . This would include activities focused on knowledge and information and communication technologies (ICT), environment and energy, health and well-being.

Current changes are dominated by ICT. Industrial and technological policies should encourage innovation as a social activity and open process by facilitating rules on access and knowledge sharing, rather than enforcing intellectual property rules designed for a previous technological era. Open source software, copyleft, peer-to-peer activities, Wikipedia make this clear. The potential of ICT and web-based activities have the possibility of wider application, contribute to higher productivity and lower prices, create new goods and social benefits. ICT erases the boundaries between the economic and social spheres.

Current industrial models must be transformed in the direction of environmental sustainability. The technological paradigm in the future will be based on "green" products, processes and social organizations that use much less energy, resources and land, will have much less impact on climate change and the ecosystem, will switch to renewable energy sources; will organize transportation systems based on autonomously driven cars; will rely on the repair and maintenance of existing assets and infrastructure and protect nature and the Earth. Such a perspective opens up enormous opportunities for research, innovation, and new economic and social activities. A new industrial policy should address these complex, long-term challenges (Pianta, 2015).

Green growth requires green technologies: new production techniques that conserve non-renewable resources and emit fewer greenhouse gases. The availability of green technologies simultaneously reduces the social costs of transitioning to a green growth path and helps to achieve a satisfactory level of progress along that path.

The importance of using industrial policy to enable green growth is quite large. The main task facing policy makers is to secure investments in green technologies. Industrial policy can play a significant role in achieving this goal (Rodrik, 2014). The practice of new industrial policy can improve the design of institutional frameworks that counter both informational and political risks.

CONCLUSION

Industrial policy drove the very successful expansion of the economies of European countries from the 1950s to the 1970s. After that, there followed a period when industrial policy became marginalized. During the 1980s, the neoliberal revolution put an end to the old approach to industrial policy. The new ideology even led to the dropping of the term "industrial policy". The result was a general loss of influence over the direction of industrial change and structural adjustment. Interest in proactive industrial policy revived at the beginning of the new millennium.

The most significant reason was that the most successful developing countries, especially the newly industrialized countries of East Asia, were those that led an active policy of industrial development. Another reason was that the policies associated with the Washington Consensus did not sufficiently support economic development and produce the expected results. In recent decades, the dynamics of the world economy have been changing, which is of key importance for the way in which industrial policies can stimulate economic development. Industrial policy lost its selectivity and limited itself to horizontal instruments, such as tax incentives for research and development. In addition, it refers to the prediction of long-term technological trends and market development, as well as providing incentives for the structural adjustment of the national economy to new changes. Policies that facilitate structural adjustment must be reinvigorated to strengthen growth prospects. Lowering labor market barriers and improving skills development could help increase investment, productivity and make future growth more inclusive. A key priority is the revival of global trade, which is an important source of long-term prosperity for both advanced and developing economies. Increased international cooperation is needed to ensure better coordination and faster progress in efforts to reduce carbon dioxide emissions. As climate change mitigation and other environmental challenges increasingly influence the future direction of economic development, environmental considerations should become a key element in creating a new green industrial policy. Finally, it is necessary to consider the implications of recent geopolitical changes, new industrial policies and the development of artificial intelligence for the formation of a new economic framework aimed at avoiding a decade of low growth.

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MARKETING ASPECTS OF ELECTRONIC COMMERCE

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Abstract: *Electronic commerce has become an indispensable segment of contemporary business, resulting in a transformation of the way companies operate and how consumers access products and services. The focus of this study is on analyzing the impact of marketing aspects within the realm of electronic commerce, with a particular emphasis on the role of marketing in the digital business environment. Within the scope of the research, the concept of the marketing mix in e-commerce is thoroughly examined, with a specific focus on the four fundamental elements – product, price, distribution, and promotion – in the digital context. Additionally, consumer behavior in e-commerce has been analyzed, aiming to understand the factors influencing their purchasing decisions and interactions with online brands. Through this study, insights into key aspects of marketing strategies in electronic commerce are provided, emphasizing the importance of innovation, adaptation, and continuous monitoring of trends to ensure companies remain competitive and successful in the digital environment.*

Key words*: Electronic commerce, Marketing aspects, Marketing mix, Consumer behavior, Innovations*

JEL classification: *L81, M31, F02*

1. INTRODUCTION

In the contemporary business environment, an ever-increasing number of companies are acknowledging the necessity of integrated marketing and electronic commerce as a pivotal factor in attaining and maintaining success and viability in the market. This trend stems from the rapid development of technology and changes in consumer behavior, with consumers increasingly using digital channels for information gathering, product research, and purchasing. To effectively respond to these changes, it becomes essential for companies to align marketing strategies with the specificities of electronic commerce, leveraging the wealth of data and analytics to personalize communication with consumers and enhance user experiences. Additionally, an increasing number of companies acknowledge the significance of integrating marketing activities with technical and operational processes of e-commerce to create sustainable competitive advantages and maximize results. In this context, the connection between marketing and electronic commerce becomes a crucial factor for achieving success and long-term sustainability in the market. This paper is divided into the following sections: the first part focuses on the key elements of integrating marketing and electronic commerce; the second part examines in detail individual segments of the marketing mix adapted to e-commerce, while the third part is dedicated to analyzing consumer behavior in e-commerce, particularly exploring the advantages that electronic business brings.

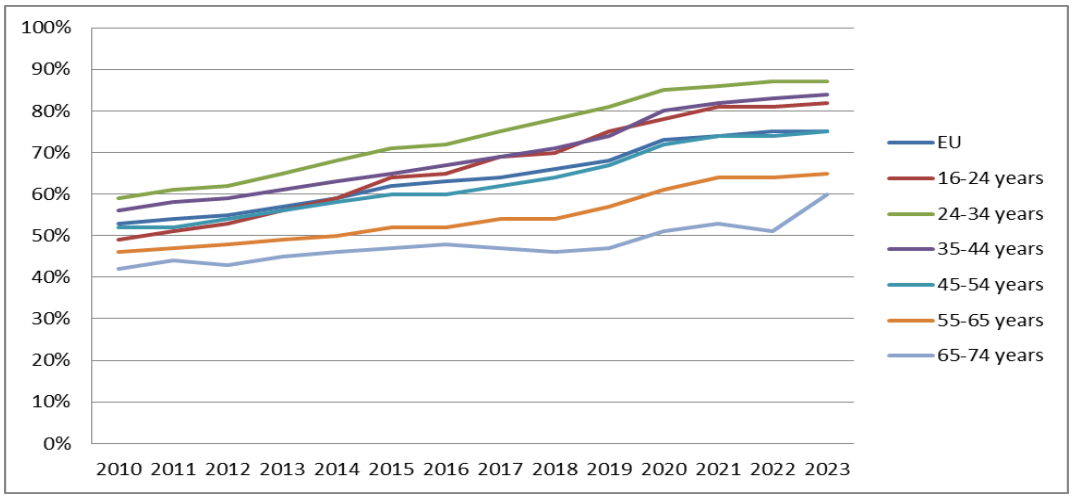
2. CORE ELEMENTS OF MARKETING AND E-COMMERCE INTEGRATION

In a world where digital technology is increasingly becoming commonplace, electronic commerce becomes the key point of interaction between companies and consumers. This new paradigm enables access to the global market with just a few clicks, opening doors to unprecedented opportunities and transforming traditional business practices. E-commerce encompasses a wide range of activities, including network

infrastructure such as routers, servers, and Internet-supporting software. A broader definition includes all electronic transactions, including those conducted via credit cards, along with the necessary infrastructure for their execution. At a stricter level, e-commerce is based on the process of buying and selling goods and services over the Internet, regardless of whether they are paid for or delivered through online platforms (Semerádová & Weinlich, 2022). This type of commerce encompasses various platforms such as online stores, electronic marketplaces, and digital service delivery platforms E-commerce has become a fundamental component of the contemporary economic infrastructure, facilitating the global reach of companies and offering users a vast array of products and services. With the increase in internet speed and the development of secure online payments, e-commerce has experienced explosive growth in recent decades. Today, users can purchase almost anything they need online, from everyday essentials to luxury products, with just a few mouse clicks or screen touches. The accessibility and convenience of e-commerce have become an integral part of the modern consumer's life.

Since 2015, there has been a discernible generational divide among internet users with regard to their attitudes towards online shopping. Younger age groups, such as 16-24 years old, 25-34 years old, and 35-44 years old, are above the EU average in terms of online shopping frequency, while older age groups, such as 55-64 years old and 65-74 years old, are below average. In 2023, 87% of individuals aged 25 to 34 used internet services to purchase goods or services for personal use. This represents an increase in comparison to the figures for 2021. when online shopping surged particularly during the COVID-19 pandemic. In terms of percentage, the age group of 35 to 44 follows with a share of 84%, which also represents an increase compared to 2021. In 2023, 82% of the age group of 16 to 24 bought or ordered goods or services via the internet, representing a 1 percentage point increase compared to 2021. The age group of 45 to 54 accounted for 75% in 2023, which is in line with the EU average for that year and 1 percentage point above the participation of this age group in online shopping in 2021. The share of the remaining two age groups (55-64 years old and 65-74 years old) was below the EU average, with a share of 65%, i.e., 60%, by the end of 2023. (Eurostat, 2024).

Chart 1. Distribution of internet users in the EU who made purchases or placed orders for personal use within the last year, categorized by age groups



Source: *Eurostat (2023)*

However, merely setting up an online store is not enough to achieve success in e-commerce. It is crucial to attract the attention of consumers among the numerous competitors on the internet. This is where marketing comes into play. Marketing encompasses all the strategies and activities a company employs to boost the sales of its products and services. This involves adjusting production and distribution methods to meet consumer needs and demands. marketing, in the context of e-commerce, includes strategies and techniques that companies use to attract, engage, and retain users on their online platforms (sfetcu, 2015). through the use of digital channels such as social media, email, and targeted advertising, marketing plays a role in enhancing the visibility of e-commerce**,** behavior. Additionally, marketing enables companies to tailor their products or services to

the needs and desires of the target audience, thereby increasing the likelihood of converting visitors into customers. Marketing in e-commerce plays a crucial role Building customer relationships is essential in e-commerce. Through personalized campaigns, relevant content, and effective communication, companies can build loyalty among their users, which contributes to the long-term stability and growth of their business. In summary, marketing is crucial for e-commerce success because it enables companies to reach the right target audience, build customer loyalty, and gain a competitive advantage in the digital market. Without effective marketing, even the highest quality products or services may go unnoticed amidst the vast online offerings. Consequently, it becomes imperative for all companies engaged in e-commerce to invest in effective marketing strategies.

To fully leverage the potential of marketing and e-commerce, it's necessary to integrate these two disciplines, creating synergy that allows companies to reach their target audiences most efficiently and achieve sustainable growth in the digital environment. Digital platforms such as websites, mobile applications, and social media provide the primary channel for promoting products and services, enabling companies to reach a broader audience and establish their online presence. Through the use of digital platforms, companies can directly interact with consumers and tailor their marketing strategies to meet their needs. However, for these platforms to be effective, it's essential to track their performance and user responses. This is achieved through analytics and tracking, where companies can gain insights into how users react to their digital marketing activities. Analytics enables companies to identify trends and user behavior patterns to adjust their strategies accordingly. Based on this information, they can optimize their strategies and content to improve their results.

In this process, SEO (Search Engine Optimization) and SEM (Search Engine Marketing) play a crucial role, allowing companies to be more visible online and attract more users to their digital platforms. Through the use of SEO and SEM techniques, companies can improve their rankings on search engines and target advertise their products and services to users who are interested in them. Through these optimizations and better visibility, companies can create a positive user experience on their online platforms, focusing on elements that will enhance user interaction, increase customer loyalty, and encourage repeat purchases.The integration of digital platforms, analytics, SEO, and SEM forms the basis for a successful e-commerce strategy that caters to the needs of modern consumers (Šarac, Radovanović and Jevremović, 2018)

3.MARKETING MIX IN ELECTRONIC COMMERCE

In the world of marketing, the concept of the marketing mix represents a key tool that companies use to effectively position their products or services in the market. It is not a scientific theory but a conceptual framework that identifies the main decisions managers make when configuring their offerings to meet consumer needs. These tools can be used to develop both long-term strategies and short-term tactical programs (Palmer, 2012). Electronic commerce has further evolved this concept, offering companies new opportunities to adapt their strategies to the digital environment and create competitive advantages. Through electronic commerce, the marketing mix becomes an even more crucial factor in business, as online platforms enable more direct interaction with consumers and faster responses to changes in the market environment. With the help of digital tools, companies can more accurately track customer needs and preferences, adjusting their marketing mix accordingly.

3.1. E – PRODUCT

The growth of e-commerce has not only changed the product element of the marketing mix but has also led to fundamental transformations in the nature of products themselves. The original definitions of products were based on physical goods or services, however the advent of digital technologies has introduced new dimensions. First, products now combine tangible components with digital services, opening the door to a wide range of new possibilities and experiences for consumers. Second, the advent of digital technologies has facilitated the networking of products, thus integrating them into a broader digital ecosystem, creating additional value and interaction for users. Third, products are increasingly transformed into digital services, emphasizing the growing importance of the digital experience in e-commerce (Kannan and Li, 2017).

In the context of electronic commerce, the essence of the "Product" segment partly overlaps with the traditional concept but also brings new aspects. E-commerce enables the development of new electronic distribution channels and creates a virtual environment that fosters the production of goods and consumer goods tailored to online demand. A key characteristic of the assortment of electronic retailers is the ability to develop product clusters that do not have a physical form but are based on digital or virtual forms. The essential characteristics of such goods are that

they implement an "economic form" of information, namely forms of its economic realization, exchange, transfer, use, and consumption. This trend underscores the increasing impact of digitalization on how we perceive and consume products in e-commerce (Hamari and Keronen, 2017).

3.2. E – PRICE

Pricing is an intriguing topic in the online environment as it is the only element of the marketing mix that generates revenue (Allen and Fjermestad, 2001). The pricing segment within the marketing mix in e-commerce plays a significant role in attracting and retaining customers, but it differs from traditional market approaches. In e-commerce, prices are more transparent and subject to dynamic changes due to the rapid and easily accessible access to market condition information.

One of the key aspects of pricing in e-commerce is dynamic pricing, where algorithms analyze data on demand, competition, and other factors to automatically adjust product prices in real-time. This enables companies to optimize their revenue and profitability, as well as attract consumers with offers that are relevant to their needs and preferences. Prices are dynamic in the online environment due to several key factors. First, the online market is highly transparent, meaning consumers can easily compare prices of products from different sources. Second, competition is very intense, with a large number of sellers offering similar products. Third, digital technologies allow companies to automatically adjust prices in real-time based on factors such as demand, supply, and competitor behavior. This puts additional pressure on companies to be competitive and constantly adjust their prices to match changing market conditions. Additionally, various pricing strategies are often used in e-commerce, such as dynamic price differentiation for different consumer segments, offering personalized discounts and promotions, and using tools for dynamically tracking competitor prices. All of this aims to maximize value for consumers and increase competitiveness in the online market.

It is important to note that in e-commerce, price is not the only factor influencing a customer's decision; providing additional value through fast delivery, easy navigation, transaction security, and quality customer support is also crucial.

3.3. E – PLACE

Unlike traditional stores, where physical location is significant, e-commerce platforms operate in a virtual environment where geographical barriers are virtually non-existent. Today's consumers are not limited to a specific location for shopping but can access online stores wherever they have an internet connection (Allen and Fjermestad, 2001). The emergence of e-commerce has redefined the concept of distribution, emphasizing accessibility and convenience for consumers worldwide. Online stores provide customers with accessibility, meaning they offer flexibility in choosing the time and place for shopping. This means that customers can purchase products or services at any time of day or night, regardless of their location. Online stores offer a particularly useful alternative, eliminating the necessity to physically travel to physical stores, which results in reduced congestion, shorter wait times, and reduced travel costs. Customers are provided with access to a wide range of products and stores that may not be available in their vicinity, further increasing convenience and choice.

While many companies remain or start as virtual merchants without physical presence, an omnichannel approach is becoming increasingly prevalent. Instead of limiting purchases to a specific physical location, an omnichannel strategy allows customers to access products or services through different channels, including online platforms, physical stores, and mobile applications. Particularly significant is the integration of channels when customers seek information in one but make purchases in another (Chen, Cheung and Tan, 2018).

In the traditional distribution model, logistics was a crucial element in the transfer of physical products from manufacturers to end consumers. This process required building a supply chain that would enable efficient management of warehouses, transportation, and product distribution. However, the development of information technologies and the internet has changed the way distribution occurs. Today, instead of relying solely on physical products, distribution increasingly relies on the transfer of information, ideas, and services over the network. This new approach enables the transfer of software, digital products, and services with almost instantaneous effect, without the need for physical distribution. This transition to virtual exchange of information and services via the network brings numerous benefits, including cost reduction, greater speed and efficiency, as well as greater flexibility for all parties involved. It also opens the door to new business models and innovations that are impossible in the traditional distribution model.

3.4. E – PROMOTION

In e-commerce, the promotion of products or services takes place through digital channels such as websites, social media, email, and other online platforms. These channels enable companies to

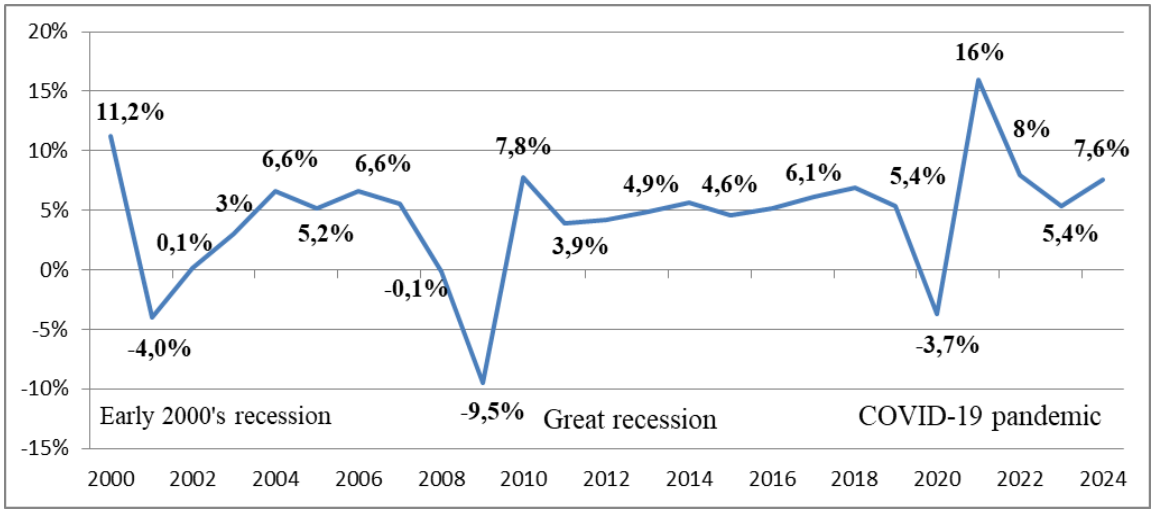
reach a wide range of consumers globally, using various techniques and tools for promotion. Promotion elements in e-commerce may include creating effective digital advertisements displayed on websites or social media, organizing promotional events online, sending personalized emails or direct marketing messages, as well as using influencers or bloggers to promote products through their online channels.

Global advertising expenditure analysis is the process of studying and interpreting data on advertising spending worldwide to understand trends, patterns, and dynamics in this sector. This analysis is important as it provides insights into economic, social, and technological trends, enabling companies to make informed decisions about resource allocation and advertising strategy to maximize efficiency and gain a competitive advantage. The analysis of the global advertising market from 2000. to 2024. reveals a dynamic picture of changes in advertising costs during that period, reflecting economic and social events that have shaped the industry over the past two decades.

At the beginning of the millennium, the world faced the challenges of an economic recession, which was particularly pronounced during 2001. and 2002. These recession periods were reflected in fluctuations in advertising costs, including an unexpected decline of -4.0% in 2001. The period thereafter was characterized by moderate growth in costs, up to 6.6% in 2006. However, in 2008, a global economic crisis occurred, which had a serious impact on the advertising market. Costs plummeted to -9.5%, marking a significant decline. This period was extremely challenging for many industries, including advertising. After 2011, the situation slowly stabilized, with average advertising cost growth remaining at around five percent. Then, the world faced a new challenge in 2020. when the outbreak of the COVID-19 pandemic resulted in a significant decline of -3.7% in advertising costs. Despite the aforementioned challenge, 2021. was distinguished by an impressive growth of 16%., which will prove to be the highest percentage of the observed period. According to forecasts, the industry anticipates a resurgence in costs by 7.6 percent by 2024. (Statista, 2024).

Promotion aims, among other things, at informing, persuading target customers, and reminding. This explains the objectives of promotion. (Tjiptono, 2008). Firstly, promotion aims to inform consumers about the company's products or services, providing them with relevant information about the characteristics, benefits, and features of the products or services.

Chart 2. Global expansion of advertisig



Source: *Statista (2023)*

Secondly, promotion seeks to persuade target consumers to choose the company's product or service, using various techniques and marketing strategies to attract attention and stimulate the desire to purchase. Thirdly, promotion serves the purpose of reminding consumers of the existence and advantages of the company's products or services, keeping them present in consumers' minds and encouraging them to reconsider their choice or return to purchasing. All these purposes

of promotion aim to increase sales, create consumer loyalty, and build brand awareness.

The structure of advertising media has become increasingly complex as digital platforms have become ubiquitous and diverse. With a wide range of channels for promoting products or services, marketing professionals are faced with the challenge of choosing the most effective media and reaching their target audience. This growing number of media requires a deeper understanding of consumer preferences and habits, as well as adaptable advertising strategies to achieve optimal impact and return on investment. At a global level, segments such as Audio Advertising, Banner Advertising, Classifieds, Influencer Marketing, Search Advertising, and Video Advertising stand out.

Audio Advertising: Audio advertising refers to the promotion of products or services through audio formats such as radio commercials, ads on music streaming platforms, or advertisements in podcasts. Audio Advertising has experienced gradual growth, reaching approximately 10 billion dollars by 2023.

Banner Advertising: Banner ads are digital advertisements displayed on web pages in the form of static or animated images. Banner Advertising remains one of the primary means of advertising, continuing to attract the attention of marketing professionals. Since its inception, this form of advertising has undergone significant evolution, adapting to technological and social changes, and catering to the needs of modern internet users. During the observed period, investments in banners have nearly doubled.

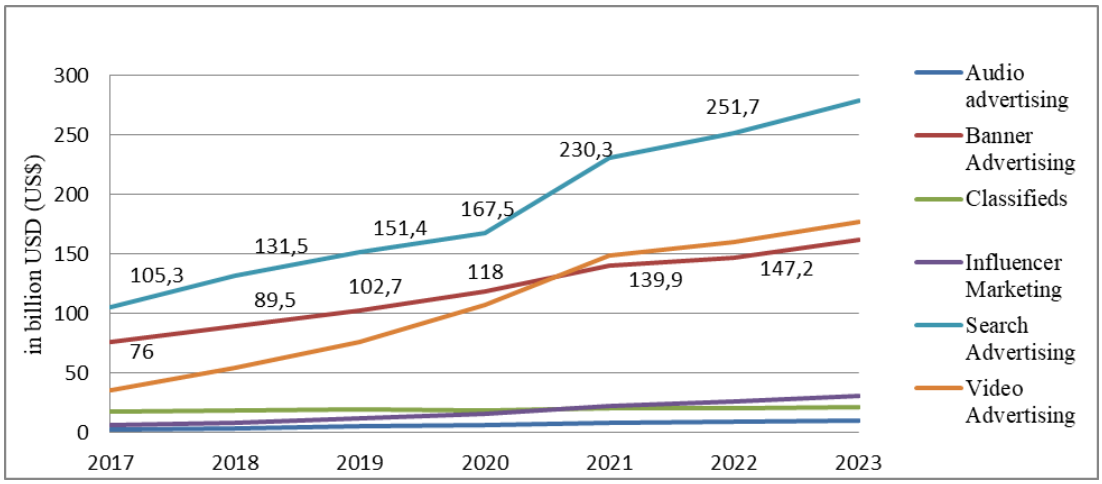
Classifieds: Classified ads are advertisements used for selling or renting products or services, typically organized into categories such as real estate, jobs, or personal ads. Classifieds have demonstrated the greatest stability during the observed period, ranging from 17.5 to 21.1 billion in U.S. dollars.

Influencer Marketing: Influencer marketing involves collaborating with influential individuals, known as influencers, on social media platforms to promote products or services. Influencer Marketing is gradually growing, considering the increasing influence of social media and the power of influencers in shaping consumer opinions and behaviors. This trend underscores the growing importance of authentic and personal recommendations over traditional advertising methods, as brands increasingly recognize the value of partnering with influencers to directly engage their target audience on digital platforms. In 2023, an estimated 30.8 billion was invested in Influencer marketing..

Search Advertising: Search advertising is a form of digital advertising where ads are displayed to users based on their searches on search engines such as Google, Bing, or Yahoo. The significant growth in this segment is a result of the increasing use of the internet and search engines as the primary source of information, leading companies to invest more in this effective form of advertising. This segment dominates due to the growing popularity of search engines as the main source of information for users. Companies recognize the value of advertising on search engines as an efficient way to reach a target audience actively seeking specific products or services, resulting in a high return on investment in this area. Investments in Search Advertising are by far the largest, reaching 251.7 billion in 2023.

Video Advertising: Video ads are promotional videos or commercials displayed on digital platforms such as YouTube, social media, and video streaming services. The significant growth in this segment is due to the increasing popularity of video content on the internet, as well as the effectiveness of video ads in capturing audience attention and conveying marketing messages.

Chart 3. Segmentation of online advertsing (2017-2023)



Source: *Statista (2023)*

4.CUSTOMER BEHAVIOR IN ELECTRONIC COMMERCE

In the context of traditional shopping environments, consumers encounter a multitude of constraints that frequently impede the shopping experience. These include the necessity to visit the store in person in order to make a purchase, which required time, effort, and often travel. Furthermore, the selection of products was constrained to those available in local stores, which frequently resulted in consumers being unable to locate products that met their specific needs or preferences. In the modern era, consumers seek convenience, transparency, and advanced technological solutions to enhance their shopping experience.

Consumer behavior provides key insights into their needs, preferred shopping locations, and factors influencing their purchasing decisions. These decisions can be influenced by social, personal, and psychological factors. Understanding how consumers recognize needs, seek information, evaluate options, make decisions, and react after purchase is crucial for the success of product sales.

This trend underscores the growing importance of the video format in digital marketing, as brands increasingly recognize the power of video content in capturing audience attention and conveying complex marketing messages. Video Advertising is experiencing rapid exponential growth, reflected in nearly fivefold increase in investments in this area in 2023. compared to 2017.

However, understanding this behavior is challenging due to the diversity of consumer characteristics and preferences. (Cirqueira, Hofer, Nedbal, Helfert and Bezbradica, 2019).

With the advent of e-commerce, these limitations have disappeared, and consumers have become aware of the many advantages offered by online shopping. Online stores provide personalized product recommendations based on previous searches and purchases. This feature adds value to users, allowing them to discover new products or accessories that may be useful or interesting to them. This capability contributes to a more efficient and personalized shopping experience, which is often lacking in traditional stores where recommendations are less individualized.

Convenience and accessibility are among the greatest advantages of e-commerce, allowing consumers to shop from the comfort of their homes or mobile devices, whether they are at home, at work, or even on the go. This continuous access to shopping allows consumers to explore and purchase products at any time, regardless of geographic location. These factors make shopping a faster and simpler process. The process of purchasing with a few mouse clicks or screen touches enables consumers to quickly and efficiently complete their purchases without long lines or waiting at the checkout. The expediency and simplicity of the aforementioned process facilitate the ease of use for consumers to use their free time for other activities, further enhancing their satisfaction with the shopping experience. (Meng, 2009). Additionally, product personalization and recommendations are key features of e-commerce that have revolutionized how consumers research and decide on purchases. Through the analysis of past purchases, searches, and browsing behavior, e-commerce retailers can provide personalized product recommendations relevant to each individual consumer. This not

only helps consumers find products that best meet their needs but also increases the likelihood of conversion.

During online shopping, there are several factors influencing consumer behavior. These include trust in sellers, often based on store reputation, customer reviews, and transaction security. Additionally, internet accessibility, page loading speed, and availability of mobile applications play a crucial role in attracting users. Payment convenience, with various options such as credit cards, e-wallets, and bank transfers, significantly impacts the shopping experience. The variety of products on offer enables consumers to select items that align with their specific preferences, while competitive prices often determine the final decision. The presence of products that may not be available in physical stores and the ability to shop at any time further motivate users. (Sullivan and Kim., 2018).

User satisfaction, expressed through positive engagement, is crucial for marketing success as it builds the foundation of loyalty and long-term support. Customer satisfaction in e-commerce arises from the convenience and comfort of the purchasing process. E-commerce allows customers to shop according to their own schedule and preferences, without the need to physically visit a store, while the convenience of online shopping enables them to explore a diverse range of products or services in a straightforward manner. This customer satisfaction in e-commerce is not just a mere privilege but also a key factor in solidifying loyalty and increasing engagement. When customers feel satisfied with their experience, there is a higher likelihood that they will choose the same brand again for their needs. Satisfied customers are more willing to recommend products or services to their friends and family, becoming unofficial brand ambassadors. This not only contributes to brand growth but also creates a positive reputation that attracts new customers. Therefore, creating a positive shopping experience becomes a priority for companies aiming to maintain customer loyalty and achieve long-term success in e-commerce.

CONCLUSION

The complexity and differentiation of marketing aspects in electronic commerce clearly demonstrate that the integration of marketing and e-commerce is a key factor for success in digital business. Through the analysis of key integration aspects, it has been proven that effective coordination of marketing strategies with the technical and operational processes of e-commerce enables companies to create a sustainable competitive advantage in the market. This paper has highlighted the importance of adapting the classical marketing mix to the specifics of e-commerce. By properly utilizing the elements of product, price, distribution, and promotion, companies can effectively attract, engage, and retain online consumers. The analysis of consumer behavior in e-commerce emphasizes the need to understand their preferences, habits, and expectations. Through personalized marketing strategies, tailored content, and experiences, companies can enhance interaction with consumers and increase conversion rates. In conclusion, this research underscores the complexity and dynamics of e-commerce, but also highlights the numerous opportunities offered by the integration of marketing principles. Through continuous adaptation of strategies and ongoing learning from consumer behavior, companies can achieve significant success in the digital market. Marketing plays a crucial role in promoting, attracting, and engaging online consumers in e-commerce, while e-commerce simultaneously provides important data and platforms for marketing strategies and analysis, which are crucial for the development of effective marketing campaigns and business improvement.

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Review Article

CAN MANAGING ABSENTEEISM ALLEVIATE THE DEMOGRAPHIC CHALLENGES OF THE WORKFORCE IN THE REGION

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***Abstract**: This paper explores the intricate relationship between demographic changes and the phenomenon of absenteeism in the workforce, focusing particularly on Eastern European economies. The initial sections detail the profound demographic shifts, such as aging populations, low birth rates, and high emigration rates, which have significantly influenced labor markets and productivity in countries like Slovenia and Croatia. These changes have exacerbated the challenge of an already existing labor shortage, leading to increased operational costs and reduced competitiveness in laborintensive industries such as trade, tourism, and manufacturing. The central thesis of the document posits that absenteeism largely resulting from inadequate labor force and outdated work models—further compounds these issues. It examines the causes of absenteeism, distinguishing between planned and unplanned absences, and discusses their respective impacts on the productivity and financial overhead of businesses. The study also addresses the broader economic implications of these absences, including indirect costs like decreased client satisfaction and disruptions in business operations.*

In response to these challenges, the paper argues for strategic absenteeism management as a crucial approach for mitigating the adverse effects of demographic changes on the workforce. It suggests implementing comprehensive strategies that include early intervention, flexible work conditions, health support programs, and training for management to effectively handle absences. Such measures aim to retain workers, particularly the aging and more experienced ones, by ensuring they remain healthy, satisfied, and minimally absent from work.
Ultimately, the paper contends that while managing absenteeism can temporarily alleviate some of the pressures caused by demographic shifts, a longterm solution would require broader economic and social reforms to rejuvenate the workforce and enhance productivity sustainably. This strategic approach to absenteeism management is presented as essential not only for reducing costs but also for fostering a supportive work environment that can adapt to demographic realities and maintain economic vitality in the region.

***Key words**: Absenteiseem, Demographic changes, Sick leaves, West Balkan Region, Croatia*

***JEL classification:** J24*

1. INTRODUCTION

With the change in the economic model in Eastern Europe at the beginning of the 1990s, numerous issues related to the (non)competitiveness of economies in the region compared to countries in the near and far environment came to light. The fact is that the war events in the first years of transition, the absence of investments, and very low investments in new technologies and infrastructure renewal resulted in numerous economic problems that are still visible today. Although reduced competitiveness is often the result of several different factors, such as outdated technology or high capital costs (due to business risks), it is primarily associated with insufficient labor productivity. The causes of low labor productivity, which investors and entrepreneurs often criticize in the region's economies, can be attributed to numerous factors, starting from demographic challenges such as a lack of quality workforce (unfavorable age and educational structures), outdated organizational models not adapted to new generations of workers, to the low competencies of the workforce and managerial structures of companies. Demographic changes, visible through aging population trends, low birth

rates, and high rates of emigration of young and educated people, represent the basic challenges of each country in the region. (Jurić & Hadžić, 2021.) These factors not only affect the labor market but also have a broader impact on the economy, affecting consumption, the workforce, and public finances. In the last five years, the problem of labor shortage has been particularly pronounced in Slovenia and Croatia, economically more developed countries in the region, which previously utilized labor from neighboring countries due to similarities in the educational model and the absence of a language barrier. However, given the demographic changes that have affected all countries in the region, employers have turned to importing labor from Asia, which has not proven to be a solution due to the need for longterm integration and adaptation of workers. The aging of the workforce and the reduction in productivity due to frequent absences and slow adoption of new technologies by older workers increase labor costs and put employers at a disadvantage. Therefore, it is a priority for employers to retain existing employees in the work process for as long as possible, with minimal absences, to keep costs acceptable. Retaining existing workers is less demanding and cheaper compared to hiring new ones, which requires additional time and resources for training and integration. Thus, along with existing measures to address the problem of labor shortage, society must also address the existing working population. However, this requires employers, as well as all other participants in the economic processes, to find certain solutions for the negative phenomena that the strategy of retaining workers in the work process brings, regardless of their age and health condition. One such negative phenomenon is the temporary absence of workers from the work process, colloquially called "absenteeism". This phenomenon represents one of the key factors in productivity and generates a large part of the socalled "hidden" labor costs. Many employers are not even aware of how much absenteeism impacts their business.

Therefore, after the initial explanations of the impact of demographic changes on the labor market, the concept and causes of absenteeism will be detailed, while the third part of the paper will deal with its consequences. In the fourth part of the paper, the relationship between demographic changes and absenteeism will be explored, and in the concluding section, an attempt will be made to answer the question of whether managing absenteeism can mitigate the consequences of demographic changes, which also represents the goal of this paper.

2. WHAT IS ABSENTEEISM AND HOW DOES IT OCCUR?

The term "absenteeism" originates from the Latin word "absens" (genitive: absentis), meaning absent or not present. According to a widely accepted definition, absenteeism in labor economics refers to an employee's single or multiple instances of absence from work without a justified reason (Croatian Encyclopedia, 2024.). However, as technology advances, allowing more employees to work from various locations, such definitions become outdated, necessitating a redefinition of absenteeism. Today, absenteeism is better defined as the phenomenon of temporary and complete absence of an employee from the work process, found in organized business systems where specific business processes require human labor.

The absence of an employee from the business process can vary in duration and be caused by a range of different internal and external factors. There is a fundamental distinction between two types of absenteeism: planned and unplanned. Paradoxically, there are various forms of worker absences that an employer plans and budgets for in advance. Planned absences include annual leave (individual and collective), employee training sessions, preventive medical checkups, and absences due to planned days off (often in cycles, e.g., for field or shift work). While the causes of planned absences are relatively transparent, and their costs are predictable and limited, they still require management, primarily to avoid overlapping planned and unplanned absences. (Chakraborty & Subramanya, 2013.) On the other hand, unplanned absences present a greater challenge for employers, both in terms of costs and business process organization. An unplanned absence is any absence whose occurrence and duration are unknown, often with no planned replacements or budgeted funds. Besides sick leave, which is the dominant form of unplanned absenteeism, this category also includes absences due to unforeseeable circumstances, in accordance with legal or collective bargaining provisions (e.g., family death, family care, weddings, moving, etc.). Besides these forms, which fall under the category of macroabsenteeism, it is also important to distinguish another group – microabsenteeism. This category includes absences lasting less than one day, such as being late to work, taking frequent breaks (beyond allotted times for smoking or coffee), and leaving the organization for personal reasons.

In addition to the basic distinctions of absenteeism, it is also possible to identify absences that arise due to cultural and behavioral reasons. Among these, "capricious" absences

stand out, which include conflicts with superiors or lack of motivation due to dissatisfaction with salary or career progression. There are also absences due to personal needs or tasks (like attending to personal documentation or agricultural work) and those caused by social issues (such as alcoholism or domestic violence). Capricious absenteeism demands particular attention, especially frequent sick leaves during organizational changes, such as the dissolution of a department. Many employees, feeling insecure, may "escape" into the comfort zone of sick leave. Although not directly covered by the concept of absenteeism, there is another closely related phenomenon called "presenteeism." This refers to situations where an employee is physically at the workplace but does not fully participate in the work process. Reasons can range from the employee being too ill to work effectively, to lack of motivation or inadequate resources and tools to perform their duties. Frequent voluntary absenteeism often precedes permanent departure from the organization, known as employee turnover, which can significantly affect the organization's effectiveness (loss of knowledge and strengthening competition).

Causes of absenteeism across different levels:

1. **Macro Level**: This encompasses factors beyond the control of the participants in absenteeism, such as the state of the healthcare system, socioeconomic conditions, epidemics, and flexibility of labor laws.
2. **Individual Level**: This includes personal characteristics of each worker that can influence the frequency of absenteeism. Factors at this level include age, gender, health status, and family environment. This level also addresses causes stemming from generational differences, as different generations have varied needs, behavior patterns, and motivations for absence (e.g., poor health vs. dissatisfaction with work pace).
3. **Organizational Level**: This involves factors within the organization itself that can more or less influence workers' absenteeism. These include organizational culture, leadership, line management, selection processes, and procedures. It is worth noting the role of lower and middle management's competencies, as their inadequate people management skills often lead to conflicts or overburdening of employees, thereby supporting the occurrence of absenteeism.

Certain causes of absenteeism are linked to complex regulations or often biased or unclear legislation that defines legal relationships between employers and employees. For example, lengthy processes required to grant disability retirement to permanently incapacitated workers can significantly impact absenteeism rates. Furthermore, the acceleration and complication of business processes, which are sensitive to time and involve numerous steps with complex instructions and commands, as well as the misalignment of processes and new technologies, have a considerable negative impact on the health of the working population. Despite improvements in workplace safety and advances in medicine, the frequency and duration of sick leaves have not decreased but have shifted towards an increase in oncological and psychological diagnoses caused by stress (CIPD, 2023).

While all the aforementioned causes significantly affect absenteeism (and presenteeism), there are additional, very specific factors for sick leave that have been proven to generate the most days and cases of worker absence. Contrary to the common perception that the key driver of sick leave is the abuse of this right by irresponsible workers, the actual most influential factor is the slowness of procedures in the public health system. This situation arises when a general practitioner declares temporary work incapacity based on observations and basic tests, then refers the patient for further treatment, such as a specialist examination and/or specific diagnostic procedures to determine the course of therapy and the length of the sick leave. However, inefficiencies in the healthcare system can prolong this process for several weeks due to waiting lists, the need for the patient to travel to distant locations, or the delivery of results (Coordination of Croatian Family Medicine, 2017). Another significant driver of sick leave is the organizational structure itself, often related to the peak overloading of certain workers due to a suboptimal number of personnel needed to perform the job or frequent redistribution of tasks from absent employees to those present. The largest part of the blame for the escalation of absenteeism generated in this way falls on poorly educated line management who lack the necessary knowledge and skills in human resource management. Finally, the third most significant driver of sick leave is the misuse of sick leave by irresponsible individuals who often use such absences to perform other work to generate additional income, such as side jobs, agricultural work, or other activities. Sometimes, individual workers misuse sick leave to exert additional pressure on the employer and strengthen their position in case of a labor dispute.

3. CONSEQUENCES OF FREQUENT ABSENTEEISM

Regardless of the causes, both absenteeism and similar phenomena result in increased costs that are typically grouped under total labor costs. Historically, absenteeism costs were considered immeasurable and unmanageable, and therefore, often systematically overlooked. However, recent

trends have shifted, and organizations are now actively identifying, differentiating, and attempting to reduce absenteeism costs using advanced tools and methodologies. (Badubi, 2017).

Absenteeism costs can be differentiated into three main categories:

1. Direct Costs: These include all the costs most employers recognize and are associated with the calculation of employee wages, directly linked to the fact that an employee is absent from the work process. This category covers sick pay borne by the employer, paid leave during annual vacations, the cost of overtime that is not caused by an increase in business volume, and other allowances defined by collective agreements or labor regulations related to employee absence. Despite employers' perception that this is the largest item, direct costs only account for about onethird of the total cost of absenteeism.
2. Administrative Costs: These are the costs of additional administrative work required within an organization to record and compensate for each worker's absence. Administrative costs include, for example, the cost of calculating wages for workers absent from the work process, the cost of handling an increased volume of documentation for absent workers, the cost of the selection process for choosing replacement workers, and the administrative costs of employing substitute workers.
3. Indirect Costs: These encompass expenses that many employers do not directly associate with absenteeism but significantly affect the overall business performance. Indirect costs of absenteeism include the cost of training replacement workers, the cost of supervising substitute workers, the cost of delays and/or interruptions in business operations, and the decline in client satisfaction due to inability to deliver or delays in delivery. When discussing indirect costs, it is essential to consider the drop in productivity in the case of increased absences. For example, when one worker is absent, the employer temporarily redistributes the work among the remaining workers. If such redistribution happens very frequently or lasts too long, there is a productivity drop because workers are operating beyond their capacity.

While each of these costs presents a challenge for employers and is subject to proper monitoring and efforts aimed at reduction, most employers have yet to face the fact that absenteeism has an exceptionally large impact on work productivity. According to research, the total costs of absences expressed as a percentage of total wages paid in 2013 ranged from 6.3% in China to 12.3% in Europe. The average productivity loss in organizations when employing substitute workers was between 19.9% in Australia and 31.1% in the USA. According to this source, employee absenteeism inevitably leads to productivity loss, whether due to substitute workers who are unfamiliar with the roles they perform, colleagues who are less productive in their "regular" work because they are replacing an absent worker, or additional engagement of managers who must spend time addressing employee absences (e.g., adjusting processes, seeking replacements, etc.). The indirect costs resulting from productivity loss are often more difficult to calculate due to the subjective nature involved in assessing employee productivity. The report highlights a particularly striking fact that the share of total absenteeism costs (direct and indirect) in the gross wages paid in 2013 amounted to 20.9% in the USA and up to 38.3% in Europe. (SHRM, 2013) According to this study, the average employer in Europe pays almost 40% of wages for work that is never performed.

4. CONNECTIONS BETWEEN DEMOGRAPHIC CHANGES AND ABSENTEEISM

From the data provided, it is evident that the consequences of absenteeism have a considerable impact on the economy, particularly in Europe. The situation is even more unfavorable in Eastern European countries, where laborintensive industries (trade, tourism, manufacturing) predominate and where labor costs are a significant component of economic competitiveness. Moreover, countries in Eastern Europe, especially those closer to the region, are particularly affected by demographic changes such as population aging, emigration of the youth, and negative natural growth, raising the question: Is there a link between demographic changes and the escalation of absenteeism in their economies?

Observing certain statistical data, it is possible to find connections between these two phenomena, especially by tracking the indicators of sick leave as the dominant form of unplanned absenteeism. This is primarily because data on sick leaves are most commonly subject to statistical tracking. Although these phenomena have been recorded across the region, for the purposes of this text, data on demographic trends and sick leaves are presented only for the Republic of Croatia, where there is a certain consistency in monitoring these data. According to public sources, the issue of sick leaves in other regions is very similar to that in Croatia, but the data are quite insufficient. For example, in Serbia, official data that are available generally cover only those sick leaves that are charged to the Health Insurance Fund (sick leaves longer than 30 days), while data on sick leaves that burden employers are mostly unavailable or

at least confusing. The same can be said for other countries in the region (partially tracked or not published at all), which actually gives a rather "optimistic" picture, although the actual state of worker absenteeism is far from satisfactory. Given that Croatia has been part of Eurostat's data recording system since 2013, and since the paradigm of demographic changes and the issue of sick leaves is almost identical to other countries in the region, it can be said that Croatia represents an ideal choice for observing the connections between these phenomena.

Since joining the EU in 2013, Croatia has faced significant demographic challenges. From that year onwards, the number of emigrations has increased enormously. This is partly due to the economic crisis of 2008, from which Croatia only recovered in 2015, combined with the elimination of administrative barriers for emigration to wealthier Western European countries, leading to the country losing nearly 350,000 residents who moved abroad (Croatian bureau of statistics, 2023). Alongside the wave of emigration of mainly workingage population, Croatia has been recording a negative natural increase rate for years, and the reduction in population numbers more or less corresponds with the economic transition and the war events at the end of the last century. Indeed, the country lost more than 913,000 residents or 19% of the total population between 1991 and 2021, nearly half of that number (413,056 residents) lost in the period 2011 – 2021 (Croatian bureau of statistics, 2021). Such depopulation, especially the migration wave, could not be compensated by immigration until a significant increase in the import of labor from the region and especially from Eastern Asia, recorded during 2022 and 2023. According to the Ministry of the Interior, the number of issued work permits in 2023 has grown by an incredible 427% in just five years, from 32,734 in 2018 to 172,499 in 2023. The growth trend in the number of work permits is particularly noticeable in the period between 2021 and 2023 when the number of permits more than doubled in just two years (110%). These demographic trends have also had a certain impact on the age structure of the workforce. In the period from 2018 to 2021, the number of employed persons aged up to 24 years fell by more than 5% while the number of employed persons older than 50 years grew by 6.8%. During the same period, the proportion of those older than 55 years increased by 13.2%. The situation regarding the younger worker population significantly changed in 2022 when the number of employed under 24 years old grew by 9.9% compared to 2021, but the number of older workers did not decrease, continuing to grow, so that in 2022 there were almost 17% more workers older than 55 years compared to 2018 (Croatian bureau of statistics, 2024). This change in trend among younger workers is explained primarily by the increase in the import of workers from abroad (the number of work permits in 2022 was 51% higher than in 2021), while the continued trend of growth among older workers arises as a result of the intensive aging of the domestic working population.

The described demographic trends have almost certainly influenced the indicators of sick leave in Croatia. According to annual reports from the Croatian Health Insurance Fund, in 2022 Croatia recorded more than 20 million sick leave days for the first time, reaching nearly 21.7 million days, or 13.4 sick leave days per employed worker. However, the overall trend of increasing sick leave indicators has been visible since 2014, when the number of sick leave days grew from approximately 12.5 million in 2014 to an increase of 73% by 2022. During the same period, the number of workers only grew by 18.6%. In this context, the period between 2014 and 2015 is particularly interesting, marking the beginning of economic activity growth (exit from recession) where the number of workers nearly stagnated (a decrease of 0.9%) while the number of sick leave days increased by 11% (almost 1.4 million more days). In the following years (2016 2022), the economy grew at an average rate of about 3.4% per year, indicating a significant intensification of economic activities (Croatian National Bank, 2024). Such economic growth during the same period is accompanied by an average annual increase in the number of employed of about 3.3% each year; however, the discrepancy between the rate of increase in the number of workers and the rate of growth in the number of sick leave days becomes increasingly evident, as the number of sick leave days grows at almost double the average rate of 6.61%. This disproportion is even greater when looking at the number of cases in the mentioned period, which grows at an average annual rate of 10.35%, almost three times greater compared to the growth of the economy and the number of employed. Analyzing the period from 2018 – 2022, the connection between demographic trends and sick leave indicators becomes even more apparent. It should be noted that this is a period in which the lack of workers particularly came to the forefront. In the mentioned period, the average annual growth rate of the economy is 3.6%, the average annual growth rate of the number of workers is 1.7%, while the average annual growth rate of the number of sick leave days is approximately 6.9%, and the number of sick leave cases even 10.9%. During the same period, there was an increase in the number of workers older than 50 years by

8.9% and those older than 55 years by as much as 16.7%, while the number of workers aged 25 – 49 years almost stagnated (0.6%). Thus, the general trend in the described period is that the rate of increase in the number of workers does not keep up with the increase in economic activities, which may indicate that much of the work is performed in conditions of a reduced number of workers (the largest growth is in tourism and trade, which are laborintensive activities) while on the other hand, this overload is indicated by the much higher rate of increase in sick leave indicators. It is important to note that the impact of the Covid19 pandemic is excluded from these figures, as it is not the subject of this analysis (Stojić, 2022). A change in the trend of sick leave indicators occurred only in 2023, where, compared to 2022, the number of sick leave days decreased by 8.5% and the number of cases by 10.5%. Despite media reports suggesting that this decline was exclusively the result of intensive controls on the misuse of sick leave by workers, this trend should certainly be viewed in the light of the fact that in 2023, nearly 40% more work permits for foreigners were issued compared to the previous year, which undoubtedly resulted in a significant increase in the number of younger workers. Indeed, the control of sick leave misuse encompassed a negligible number of cases (1.89% of the total number of sick leave cases) and overall, sanctions were imposed in only 0.12% of cases, with the note that not all sanctions related to irregularities concerning sick leaves (Croatian Health Insurance Fund, 2024.). Therefore, it is more realistic to attribute the decline in sick leave indicators to the fact that, among other things, a larger number of younger workers entered the labor market.

Thus, there is a solid causal link between demographic challenges and absenteeism. It has already been mentioned that one of the key drivers of the escalation of sick leaves is working under conditions with a suboptimal number of workers. Croatia has been facing a pronounced shortage of labor for a long time, especially in the last five years, meaning that employers, in conditions of economic activity growth, have distributed work among fewer workers than necessary (+3.6% economic growth vs. +1.7% growth in the number of workers). Such an unequal distribution of work primarily occurred because employers needed much more time to find and onboard workers into the business process, so replacements did not arrive in time to share the burden. The increase in the number of older workers (+9% workers older than 50 years) further negatively impacted the already high workload, as older workers are more prone to frequent absences due to objectively poorer health conditions. Due to more frequent and longer absences of workers, employers were forced to distribute their work among the remaining workers because replacements could not be found in the labor market. As a result, the remaining workers became overburdened and frustrated, and they themselves began to take more sick leaves, creating a kind of "spiral" of rising sick leave indicators and consequent decline in work productivity. The trend only changed when the liberalization of labor import took effect with a cumulative impact during 2023. The delayed effect is likely because the import of foreign workers in the previous two years did not significantly increase productivity due to poor integration of foreign workers and lack of knowledge in managing them (Butković, Samardžija, Rukavina 2022). Highlighting the data on sick leave indicators that burden the employer's account (sick leaves up to 42 days), the culmination of worker overload is visible in the period 2021 – 2022 when the number of sick leave days charged to the employer increased by 18.4%, or, in one year, this indicator almost doubled compared to the previous four years (+36.2% in the period 201822.). Thus, when the impact of the Covid19 pandemic is excluded (which caused a slight increase in sick leaves charged to the fund by 2.5% in 2020 and 4.5% in 2021), the main trend in the increase of sick leave indicators can be linked to demographic changes such as the aging of the working population and the overburdening of workers due to the redistribution of work due to the frequent absence of other workers (https://hzzo.hr/).

5. CAN MANAGING ABSENTEEISM MITIGATE THE CONSEQUENCES OF DEMOGRAPHIC CHANGES?

Although demographic changes affecting the region are deep and farreaching, managing absenteeism can serve as a temporary lever to cushion the decline in productivity in the countries of the region. The longterm solution likely lies in other strategies such as demographic renewal, importing and integrating workers from demographically richer countries, or substituting human labor with certain technological solutions. However, each of these strategies implies a longer timeframe for action and/or fundamental social or economic reforms. The question arises: what to do in the meantime to keep labor productivity at a satisfactory level for attracting new investments and further economic growth? Here, potentially managing absenteeism as a standard business process among employers with certain interventions in the legislative framework and public health system could ensure a sufficient level of competitiveness until longterm strategies show results.

According to the author, strategies for managing absenteeism should encompass the following aspects:

• Early recognition and intervention: Introducing systems for early identification of workers who show signs of frequent absenteeism can help in timely addressing potential health or social issues.

• Flexible working conditions: Implementing flexible working hours, the possibility of working from home, and other forms of remote work can help workers better align their professional and private obligations, reducing the need for absences.

• Supporting workers' health: Introducing corporate health programs that include regular health checks, sports activities, and mental health programs can enhance the overall health status of workers and decrease the necessity for absences.

• Education and training for management: Providing training for managers on the importance and techniques of effective absenteeism management, as well as on maintaining motivation and engagement among workers.

• Integration and adaptation in importing labor: In the context of labor importation, it is necessary to ensure faster and more efficient integration of foreign workers through language courses, cultural adaptation, and mentorship programs that can shorten the time required for their full productivity.

• Improvement of legislative framework: Also, enhancing the legislative framework to enable faster and more efficient handling of absenteeism, as well as improving the public health system to shorten wait times and enable quicker return of workers to work.

Despite the fact that absenteeism management methodologies are relatively new in the field of human resources management and are considered one of the more complex areas, employers are increasingly turning to them as one of the key tools in ensuring appropriate levels of work productivity. However, absenteeism management has not yet established itself as an important skill in the countries of the region. There are several reasons for this: from low awareness that absenteeism can be managed, through poor information exchange within the organization (absence data are dispersed among lowerlevel managers and hardly reach the managers who need to make decisions), to the general stance of most companies' management on taking responsibility for solving the problem of unplanned absences. It has been noted several times in the public domain that employer representatives believe that the problem of absenteeism, especially sick leaves, should be solved by "someone else," in this case, the state. Accordingly, they address the problem to the health or socialpension system without having taken any measures themselves to prevent or reduce such occurrences. This employer stance is contrary to an environment that implies at least three participants in the absenteeism management process: employers, workers, and the state (health and social systems). All three participants strongly influence the occurrence of absenteeism, but only employers can achieve something in a relatively short period by introducing models of sick leave management. Therefore, the introduction of any method of managing sick leaves at employers can be considered the only successful way that can bring quick results with minimal investment. Concurrently, work should be done to improve the legislative framework that will better define the rights and obligations of workers who justifiably are absent from the work process and improve procedures in the public health system to avoid waiting for services that unnecessarily prolong sick leaves. However, one of the bigger challenges in introducing the process of managing absenteeism is the deeply ingrained attitude of management that the key cause of this phenomenon is the targeted and voluntary misuse of workers' rights to absence, especially when it comes to sick leaves. When an employer is faced with frequent and prolonged absences of workers from the work process, there is a natural inclination to introduce measures that include some form of repression. The management of the organization, most often intuitively and based on experience with a small number of exposed cases of absenteeism, draws potentially incorrect conclusions about possible patterns or the scale of the absenteeism problem in the organization. In most cases, this means adopting the attitude that there is "a lot" of misuse of sick leaves in the organization, even though there may only be a few unproven cases that were highly exposed (supported by the attitude of lowerlevel managers). This leads to the perception that the main motive for workers' absence is related to their voluntary decision (instead of objective health problems caused by overburden and increasing age of the working population), and attempts are made to solve the problem in such a manner. The described generalization inevitably leads to a situation where, for instance, all sick leaves are declared an undesirable phenomenon that must be "dealt with" urgently. Typically, this is followed by the introduction of "logical" measures such as financial disincentives for absences or the degradation of workers who take leave, regardless of the actual reasons for their absences. An atmosphere of fear is created within the organization, where workers believe that they will be sanctioned in some way if they are absent or that they will not be able to prove the objective

reasons for their absence. In such a model, the employer usually introduces some kind of "attendancebased bonus" (for example: a worker must not be absent more than 1 day per month) which is only paid to employees who meet the set criteria. Some employers even go a step further and, as a method of managing absenteeism, hire private investigators (or send other workers to those who are on sick leave) to either through surveillance and secret photography or through a form of courteous visit, "prove" that the worker has somehow abused their sick leave. However, such an approach can only bring additional problems to the employer. Besides generating high costs, these activities are also quite ineffective (as they do not address the real cause of the problem but rather what management mistakenly considers the real cause), and have unforeseeable consequences for the organization. If we consider this behavior of employers in the context of a lack of workers and the notorious overburdening of those who have remained in the business process, it becomes clear that repression will cause the complete opposite effect. Namely, any model of managing absenteeism that is repressive in nature generally has a very negative impact on organizational culture and the reputation of the employer in the context of socially responsible business practices. This means that in conditions of a labor shortage, an employer who enforces repression against workers on sick leave will surely not be successful in attracting new workers, especially younger ones for whom social responsibility is one of the key desirable characteristics of a future employer.

To mitigate the negative effects of demographic changes through the process of managing absenteeism, employers need to shift their mindset from mass repression to a model that helps workers return to the work process healthy and satisfied as quickly as possible. In conditions of a shortage of new workers, employers must rely on those available in the labor market, who are typically older on average and likely in somewhat poorer health. These workers do not lack motivation for work, and they are generally not dissatisfied with the compensations and benefits they receive from their employer; rather, they are simply lower in performance and thus overburdened, which gives them objective reasons for absence. Therefore, it would be rational to assume that certain measures and methods could be used to improve their performance by helping them to quickly return to the work process in case of "dropouts," or to prevent their overburdening through certain improvements in the organization itself. Under these assumptions, the methodology for managing absenteeism would encompass a range of measures, and some of them could include:

Accelerating the determination of workers' actual health status

To make sick leaves as short as possible, employers could significantly reduce the duration of sick leaves by introducing a model of advanced healthcare. Instead of waiting for examinations or tests in the public health system, it would be necessary to redirect them to a much faster and more efficient private health system, with the employer bearing the costs of these procedures. Based on the findings from such an intervention, a general practitioner could decide to end the work incapacity (if there is no basis for continuing the sick leave) or immediately start treatment, which will cumulatively reduce the number of days on sick leave. For employers, this would be quite costeffective because, by looking at the average waiting lists for certain frequent medical procedures, it is clear that a large number of workdays and the consequent direct and indirect costs can be saved.

Education of line management

Direct managers, due to their lack of knowledge or low competencies in managing people, often trigger an escalation of absenteeism themselves. In a typical business organization, good individual contributors are appointed as managers to reward them for their past contributions to the organization without determining whether these individuals have the key competencies, knowledge, and skills for managing people. As they often lack these, the appointed managers are not capable of properly managing the human resources under their charge, whether it involves managing conflicts or time, or applying transparent and objective criteria for redistributing work tasks or assigning annual leave or days off to workers. Such unskilled management leads to a situation where certain workers always work more than others, causing them to have certain health issues and consequently take sick leave. The business process then relies on the remaining workers who also become burdened and "drop out" of the process, until there is a significant drop in work productivity or it becomes impossible to carry out the business process to completion.

Reducing stress levels in the organization

Workplace stress is becoming one of the leading causes of work incapacity (CIPD, 2023), so the employer should introduce certain measures to reduce its level within the organization. For instance, the stress experienced by workers when returning to the workplace after a prolonged absence can cause recurrences in taking sick leave. Due to the pace of changes in the

organization, for a worker who has been absent for a long time, returning to the workplace means relearning and adapting to new settings while being expected to immediately take over all their responsibilities and achieve full productivity. The inability to meet these expectations creates a large amount of stress and causes objective or subjective ailments that lead to temporary work incapacity. Examples of this phenomenon are often recorded among workers who have returned to the work process after maternity leave, and the employer has not provided a period of adjustment, causing them to frequently take sick leave, justifying it with health conditions or child care needs. Measures that the employer can take in such cases include a gradual return to the work process with a specific plan and a predefined procedure.

Enabling a balance between business obligations and personal life

Working in conditions of labor shortage and "peak" loads during certain periods or parts of the business process significantly affects workers and their health. To meet goals and expectations, secure a livelihood, or gain opportunities for promotion or rewards, workers may overly focus on work, neglecting all other aspects of life. While this brings shortterm benefits to the employer in the form of high productivity, such a worker is likely to become prone to absenteeism and even permanently leaving the organization. Therefore, it is advisable for employers to introduce certain models to prevent imbalances in workers. These models include introducing benefits such as working from home, engaging in sports activities, the ability to take days off without prior notice, and organizing social gatherings for workers along with their families, etc.

In addition to these measures and tools, there are a whole range of methods for managing absenteeism that largely aim at preventing the causes of absences or providing support to workers who are absent so that they can return to the work process as soon as possible. It is also essential not to overlook the response in cases of genuinely identified abuse of absence rights because, although they are few and do not have a significant impact on increasing absenteeism indicators, they have a very negative effect on organizational culture and increase the potential for absenteeism. These comprehensive approaches help not only in managing the immediate issues related to absenteeism but also in building a supportive and resilient organizational culture that can adapt to the challenges posed by demographic changes and labor market dynamics.

CONCLUSION

Given the demographic trends and challenges facing the working population in the region, particularly in the context of increasing absenteeism, it is clear that managing this issue requires a strategic approach. Demographic changes, including the aging population, emigration of young and educated individuals, and negative natural increase, have a profound impact on the labor market and workforce productivity. These demographic challenges directly contribute to the escalation of absenteeism, especially in laborintensive sectors such as trade, tourism, and manufacturing, where labor costs are a significant factor in competitiveness. Moreover, the fact that economic activities are growing faster than the number of available workers further complicates the situation, creating an overload on existing workers, which leads to an increase in absenteeism, especially unplanned. In countries like Croatia, Serbia, and other countries in the region that are undergoing economic transition, it is evident that negative demographic changes exacerbate the already existing problem of labor shortage. In such conditions, unplanned absenteeism becomes more pronounced, directly affecting the increase in labor costs and reduction in productivity. Understanding the link between demographic changes and absenteeism is crucial for developing effective management strategies that can mitigate these negative consequences.

Employers face the challenge of mitigating the negative effects of demographic changes until longerterm strategies such as demographic renewal or integration of workers from countries with surplus labor are established. In this context, managing absenteeism can serve as a key tool for maintaining productivity and competitiveness. Increasingly in practice, it is shown that employers who effectively manage absenteeism can significantly reduce both direct and indirect costs associated with worker absences. Managing absenteeism, if conducted strategically and systematically, can greatly alleviate these challenges. The primary goal is to reduce unplanned absenteeism through a series of proactive measures that include better management of health at work, flexibility in work arrangements, and improving the work culture through open communication and support for workers. It is also important to educate managers and leaders about the importance of managing absenteeism and the methods that enable it. From this, it follows that employers should implement proactive measures for managing absenteeism, which includes better management of the health and fitness of workers. Managing absenteeism

should not be stigmatized or based on repression, but rather on understanding the causes and prevention. A strategy that enables workers to be healthy and satisfied in their work environment, and provides them with the necessary support, will ensure better overall efficiency and productivity, thus improving the economic outlook for the region. By implementing these strategies, employers can not only reduce costs associated with absenteeism but also create a work environment that is adapted to demographic changes and challenges of the modern workforce. This is crucial for maintaining a high level of productivity and competitiveness in the market, which is vital for the economic growth and development of the region.

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Review Article

OPERATION OF TOURIST BUSINESS ENTERPRISES USING INFORMATION-COMMUNICATION TECHNOLOGY

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***Abstract**: Overcoming crisis periods in business on the tourist market in Serbia is effectively overcome by using modern information and communication technologies. The development and use of these technologies enabled the broader application of electronic distribution channels that enable more comprehensive access to the market. This is particularly significant in the tourism industry due to sudden demographic changes and migration processes of tourists and employees in this propulsive business area. Travel agencies, as well as other entities in the tourist market, operate more and more intensively (even predominantly) using information and communication technologies. The effects of using personal computers, the Internet, global distribution, and reservation systems are multiple. They are manifested in the expansion of the market, the improvement of the placement of tourist products, increased business efficiency, cost reduction, strengthening competiveness, and the potential disintermediation of traditional travel agencies. This paper contains the summary results of research conducted in 2023 among travel agencies in Serbia on the impact of the most modern information and communication technologies on the tourism market in Serbia and its transformation from the perspective of business efficiency and competitiveness.*

***Key words**: modern ICT, tourist market, transitional changes, migrations, transformation, competitiveness.*

***JEL classification:** D12, O12, E20*

1. INTRODUCTION

Modern information and communication technology (ICT) is critical in the functioning of the modern economy, market, individuals, and society. These sophisticated technologies have far-reaching consequences for all spheres of human activity. This means that externally dynamic progress in ICT and digital data processing contributes to shaping all human activities into a specific techno-economic system called the "digital economy." The dynamic development and comprehensive application of the Internet produced new electronic distribution channels, leading to the effective expansion of the tourist market. This especially applies to economic activities such as tourism, which rely mainly on information. ICT significantly impacts the efficient business of travel agencies, where online sales are beginning to dominate. In an increasingly turbulent market, the survival of travel agencies largely depends on quick adaptation to ever-faster changes and mastering increasingly modern technologies. Therefore, the intended research was based on the assumption that applying this technology increases competition in business, and from the aspect of tourism companies, the work focuses on travel agencies. The central topic is the impact and the way ICT application reshapes the tourism market. However, the effects of application cannot be achieved by segmental application. However, essential changes are achieved by introducing and applying an integral information system, leading to acceptable competition in the tourist products and services market. Essential changes in this activity were created by unifying the information and communication system all tourism employees use. Internet services enable access to the global market and enable multiple advantages: (1) cost reduction, (2) market expansion, (3) intensive marketing, (4) the power of constant interactive communication with potential clients, partners, and other market participants;

These are just some opportunities that can be used as advantages in the tourism market. The overall processes, incited by the application of ICT, were

significantly intensified by the deregulation of air traffic because much more information is used, with constant changes, thanks to the appearance of new airlines, the introduction of new routes, frequent changes in tariffs, stimulating policies of special tariffs and the like (Petrović, 2019, p. 34-45). The most significant changes took place in the distribution of tourist services thanks to the widespread use of central reservation systems and intensified Internet use. The modern tourist market is an electronic market where distribution and marketing are carried out using electronic media. The Internet enabled a simple and cheap system of communication with the market, which represented an additional incentive for the global business orientation of leading tour operators while at the same time providing a far more efficient system of direct communication with consumers (Petrović, 2014, p.33). Electronic distribution channels represent a great challenge and threat, considering that they lead to the disappearance of traditional intermediaries in the tourist market (disintermediation), so implementing "electronic intermediaries" is intensifying more and more. The comprehensive application of ICT resulted in a noticeable improvement in the functioning of tourism organizations, both internally and externally. Back-office functions (accounting, monitoring of commissions, personnel) and front-office functions (client history, creating routes, issuing tickets, and communication with suppliers) were integrated so that, in their business, travel agencies reached a high level of synergy, efficiency, and effectiveness, which resulted in a reduction in business costs. Therefore, a more comprehensive business control is achieved by monitoring transactions automatically forwarded to the headquarters (Bethapudi, 2013, p. 67-79). The tendency for numerous clients to independently search for favorable and attractive tourist arrangements is developing, thus changing the agencies' business. On the other hand, many agencies have switched to doing business exclusively via the Internet, occupying a significant place in the tourist market. This type of agency business became dominant during the pandemic (2020-2022), and significant disruptions occurred in the market. However, the Internet began to take precedence even before the general business crisis. For example, a 2018 survey found that over 57% of Americans purchased or booked travel arrangements online, compared to only about 18% in 2000 (Horrigan, 2019, p.43). Research conducted in 2023 showed that 2023 94% of Americans used the Internet to plan and book travel in any form (Chose & Fesenmaier, 2024, p.428). At the beginning of the twenty-first century, there have been significant changes in the distribution of tourist products and consumer services. Over time, the application of ICT technologies has intensified and led to changes in distribution channels. Online access to information and accommodation booking, plane tickets, etc. Consequently, it was reflected in business and the modeling of agencies and tour operators. In addition, new intermediaries emerge on the market, especially under the influence of the Internet as an essential communication and sales channel for tourist products and services. That is why some analysts predicted the disappearance of classic travel agencies and mediation (Rodrigues et al., 2023, p. 20). In addition to reshaping the tourist market, modern ICTs are changing the competitive structure. This is mainly related to the acquisition of that advantage and is affected by the online visibility that only a limited number of companies can have at the top of the search engine results list when searching for tourist content (Smithson et al., 2011, p. 1583), Application of ICT a new service appears, and then suddenly develops online self-service travel. For those interested, this kind of service is made possible by online platforms that offer extensive information about attractive sightseeing locations, accommodations, restaurants, transport connections, shopping, and entertainment. Clients can choose the attributes and the way of travel according to their wishes. The platform will automatically create a route based on the criteria and display appropriate information about the desired trip (Xiaolong et al., 2018). In tourism agencies in Serbia, owners filled out questionnaires from small agencies during the research, while in large ones, managers at the middle and high management levels filled in the questionnaires. The study's primary goal was to determine the impact of applying the most modern ICT on travel agencies' business. The primary hypothesis from which this research started is that the application of modern ICT in the business of travel agencies intensifies competition among them and on the market, and to test this assumption; the agencies were offered a position based on which they ranked on the scale.

2. MATERIALS AND METHODS

In treating new business trends, the possibilities of applying many online self-service travel systems were considered. For example, Plan Tour uses an automatic planning approach to generate a multi-day plan with the most relevant points of interest in a city/region being visited. The system collects information about users and points of interest, groups those points with the help of clustering techniques, and fragments the system - problem into daily subproblems. An automated planner is then used to create high-quality travel plans based

on user ratings on social networks. This means using an intelligent system that crosses generated knowledge with efficient automated techniques (Cenamor et al., 2017, p. 1). During 2023, 239 travel agencies (YUTA) operated on the territory of Serbia. In the Research conducted that year, 120 travel agencies were included. According to the compiled questionnaire, all agencies were divided according to basic features:

- Size of tourist agency (small, medium, large);
- Character of the travel agency (local, regional, national, international;
- The business area of the tourist agency (organization of services in tourism, mediation in the provision of services in tourism, organization and mediation in the provision of services in tourism);
- Number of branches for performing activities (one, from 2 to 5, more than 5);
- Total number of employees (1-5, 6-20, 21-50, over 50);
- Types of services provided by the travel agency and the territory where these services are provided).

The presentation of research results primarily includes answers to questions related to the use of ICT in business:

- Do you apply modern ICT in business?
- How many computers do you have?
- Do any of your employees have computer training certificates?
- Do you have a professional in charge of computer maintenance?
- What is your agency's internet connection speed?
- Do you have your website?
- Do you have a person in your employment who regularly maintains and updates your website?
- Which package do you use for web hosting of your internet presentation?
- Which of the global distribution systems do you use in your agency?

Table 1. Essential characteristics of travel agencies from a sample of 120 (in%)

By size	small	60,6	medium	29,2	large	10,2	
Tourist agency character	local	32,2	regional	32,2	national	21,2	intern.14,4
Number of branches	1	65,2	from 2 - 5	26,3	more than 5	8,5	-
Total number of employees	to 5	66,9	from 6-20	19,5	from 21-50	8,4	over 50 10,2

Source: Author's observation during research in 2023

In the questionnaires, a certain number of positions were offered, which the respondents had to rank according to the principle of the Likert scale (do not agree at all, mostly disagree, neutral, mostly agree, completely agree). The points that were offered to the tourist agencies for ranking are the following statements:

- The application of modern ICT in business contributes to the reduction of business costs;
- The application of ICT to the business of the agency contributes to greater business profitability;
- The offer of arrangements on our website is regularly updated;
- We offer our clients the possibility of online reservation arrangements;
- ICT increases competition in the tourist market;
- Traditional travel agencies that are unable to adapt to the increasingly dynamic market and master the latest technologies will be pushed out of the market;
- Clients will, in the future, satisfy a more significant part of their needs via the Internet;
- The support of global distribution systems to travel agencies has a positive effect on the placement of tourist products;
- The application of modern ICT in the business of travel agencies contributes to greater business efficiency.

All these hypotheses require proof or rejection, and the results of ranking certain attitudes are often used. To confirm the main hypothesis, Pearson's X2 - test was used to prove a direct connection between the answers when ranking different attitudes, contingency tables, Pearson's X2 - test, as well as Spearman's □ (ro) and

Kendall's tB (tau-b) were used—the correlation coefficient.

3. RESEARCH RESULTS

The given sample of travel agencies was first asked to answer questions related to using ICT in business. Then, they were offered a certain number of attitudes, and they ranked according to the principle of the Likert scale. The most important results of the research are presented in 7 paragraphs, and they are as follows:

- More than half of the travel agencies included in the research (52.4%) have intermediaries with a computer training certificate. The percentage of agencies with such employees grows along with the agency's size.
- All surveyed agencies use broadband Internet access, with only 19.1% of surveyed agencies responding that they use slower broadband connections of 1-5 Mbps. While all others (89.9%) use connections faster than 5 Mbps;
- 13.6% of the surveyed agencies answered that they do not have their website;
- They do not use any global distribution system, answered 40% of the surveyed agencies, and of those that are used in the travel agencies in Serbia, the most represented are Amadeus and Galileo/Appolo;
- 44.9% of agencies, or almost 27.1% of agencies from the sample, fully agreed that ICT contributes to the reduction of business costs;
- Half (50%) of the agencies or most (38.1%) of the agencies from the questionnaire fully agreed that ICT contributes to greater business profitability;
- Most of the surveyed agencies believe that the support of global distribution systems in travel agencies has a positive effect on the placement of tourist products.

Table 2. Ranks the offered position
Opinion: ICTs increase competition in the tourist market

Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Mostly disagree	1	8	8	8
Neutral	16	12,9	12,9	12,7
Mostly agree	31	26,3	26,3	39,0
Completely agree	72	61,0	61,0	100,0
Total	120	100,0	100,0	

Source: Results of a survey conducted in a sample of 120 t.a. during the year 2023

The initial hypothesis was tested using data from 120 tourist organizations in Serbia. These organizations were assumed not to have a clearly defined position on the impact of ICT on increasing competition in the tourism market. The respondents' answers were not randomly distributed, with varying numbers of answers in each of the five offered categories. The expected frequencies (for each of the five provided answers) could be 120:5 = 24.0. However, the X2 test was used to check whether the recorded frequencies deviate from the expected frequencies. The null hypothesis (H0) is based on the fact that there is no difference between the answers provided by tourism organizations in Serbia and randomly distributed answers. The test results of this research are presented in the IBM SPSS program. Research indicates, from the aspect of perceived and expected frequencies and possible deviations, because no agency ranked the stated position with the answer "I do not agree at all," the expected frequencies for the remaining four answers are 29.5 for the entire sample.

Table 3. Observed and expected frequencies.
ICT increases competition in the tourism market

Opinion	Observed frequencies	Expected frequencies	Deviation
Mostly disagree	1	29.5	-28,5
Neutral	16	29,5	- 15,5
Mostly agree	31	29,5	1,5
Completely agree	72	29,5	42,5
Total	120		

Source: Research on a sample of 120 agencies during the year 2023.

The value of the X2 test is 96,983, and it should be noted that no cell has an expected frequency lower than 5, which is essential for the reliability of the X2 test results. The results show that the observed frequencies are statistically significantly different from the expected frequencies. According to this result (X2 - test) and the observed deviations observed from the expected frequencies, the null hypothesis (H0) is rejected. The alternative hypothesis (H1) is accepted, considering that there is solid statistical evidence that tourism agencies in Serbia believe that applying modern ICT into their business increases the competition in the tourist market.

Tabel 4. Ranking of the positions offered

Attitude: In the future, the client will have an increasing part of his tourist needs via the Internet				
Opinion	Observed frequencies	Expected frequencies		Deviation
Strongly disagree	1	8	8	8
Mostly disagree	3	2,9	2,5	3,4
Neutral	9	7,6	7,6	11,0
Mostly agree	35	29,7	29,7	40,7
Completely agree	70	59,3	59,3	100,0
Total	120	100,0	100,0	

Source: Authors, survey conducted in 2023

4. DISCUSSION

Undeniably, the research results confirm that tourist agencies in Serbia believe that the application of modern ICT in business increases competition in the market. From that aspect, in order to get a clearer picture of the research results and more precisely determine the reasons for this attitude of travel agencies in Serbia, with the help of contingency tables (cross-tabulation), Pearson's X2 - test, as well as Spearman's ro and Kendall's tB (tau- b) correlation coefficient, the interdependence of the ranking of the previous position with the ranking of other positions carried out by the travel agencies included in the research was also analyzed. For example, one of the opinions offered is that "in the future, clients will satisfy an increasing part of their tourist needs via the Internet." Table no. Three shows how the travel agencies included in the research ranked this attitude.

Using the contingency table and Pearson's X2 test, the data from this position were compared with the agencies' responses when ranking the position used to prove the hypothesis (Table 1). Then, the correlation of the ranking of these positions was examined with the help of Spearman's (ro) and Kendall's (B) correlation coefficients. These results are presented in the following tables.

Table 5. Person's X^2 – test

	Value	Degree of freedom	Significance (two-tailed)
Person's X^2	25.691	12	.012
Odds ratio	21.923	12	.038
Linear-linear association	10.880	1	.001
Number of valid cases	120		

Source: Authors, research results, 2023.

Using the contingency table and Pearson's X2 test, the ranking of the previous position was compared with the agencies' responses when ranking the positions used to prove the hypothesis (table 1). Then, the correlation between the ranking of these positions was examined with the help of Spearman's r (ro) and Kendall's tB (tau-b) correlation coefficient. Based on the results of Pearson's X2 test (25,691) at a significance level of 0.012, it can be concluded that those agencies from the sample who believe that the use of ICT increases competition in the market, also agree that in the future, clients will satisfy an increasing part of their tourism needs via the Internet. The correlation during ranking these attitudes was determined with the help of Spearman's (ro) and Kendall's tB (tau-b) correlation coefficient. These correlation coefficients show a significant positive correlation when ranking the expressed attitudes at the significance level of 0.01, which is two-way. The next position offered was: "Traditional travel agencies that are unable to adapt to an increasingly dynamic environment and to master new technologies will be pushed out of the market."

Table 6. Ranking of the position offered.

Attitude: Traditional TAs are unable to adapt to an increasingly dynamic environment Moreover, to master new technologies, they will be squeezed out of the market.

Opinion	Observed frequencies	Expected frequencies		Deviation
Strongly disagree	6	5,1	5,1	5,1
Mostly disagree	3	2,5	2,5	7,6
Neutral	21	17,8	17,8	25,4
Mostly agree	31	26,3	26,3	51,7
Completely agree	59	50,3	50,3	100,0
Total	120	100,0	100,0	

Source: Authors, research results, 2023.

Looking at the contingency table and Pearson's X2 test, the ranking of this position is compared with the agencies' responses when ranking the position used to prove the initial hypothesis. Based on the results of Pearson's X2 test (61.953) at the significance level of 0.000, it can be concluded that the sample agencies believe that modern ICT use increases competition in the market. They think that classic travel agencies, which cannot adapt to an increasingly dynamic environment and master the most modern technologies, will be pushed out of the market. Correlation analysis points to that conclusion, considering the ranking of the proposed positions. This means that Kendall's tau-b and Spearman's ro correlation coefficients show a significant positive correlation when ranking these attitudes at a significance level of 0.01 in that period.

Table7. Person's X^2 – test

Indicator	Value	Degree of freedom	Significance (two-way)
Person's X^2	61.953	12	.000
Odds ratio	30.178	12	.003
Linear-linear association	10.351	1	.001
Number of valid cases	120		

Source: Authors, research results, 2023.

The following table shows the ranking of attitudes related to the impact of ICT on increasing profitability and reducing the operating costs of travel agencies.

Table 8. Ranking of the positions offered

Position: The application of modern ICT in the operation of agencies contributes to greater profitability				
Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Strongly disagree	1	8	8	8
Mostly disagree	3	2,5	2,5	3,4
Neutral	10	8,5	8,5	11,9
Mostly agree	45	38,1	32,1	50,0
Total	120	100	100	

Source: Authors, research results, 2023.

Looking at the views on the impact of ICT on increasing the profitability of the business (previous table) or on reducing business costs (following table) and the concordance of the ranking of these views with the ranking of the view that was used to prove the hypothesis (table no. 1), results were obtained that do not say enough in contribution to the existence of a statistically significant connection between the answers given by the agencies.

Table 9. Ranking of the positions offered

Position: The application of modern ICT in the operation of agencies contributes to greater profitability				
Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Completely disagree	2	1,6	1,6	1,6
Mostly disagree	5	4,2	4,2	5,9
Neutral	26	22,0	22,0	28,0
Mostly agree	32	27,1	27,1	55,1
Total	120	100,0	100,0	

Source: Authors, research results, 2023.

Although the non-parametric correlation coefficients showed the existence of a significant positive correlation at a substantial level of 0.01 in the first (Kendall tau-b = 0.246; Spearman ro = 0.272), Pearson's X2 test in both cases did not show a connection between the responses of the agencies, when ranking the mentioned attitudes (table 1, 8 and 9) at a statistically significant level. This means that the agencies (which participated in the research) accept that ICTs influence the level of competitiveness but do not justify their introduction into business with lower business costs or increased profitability. This is because the introduction of ICT in the business of agencies requires significant investments in hardware and software, training employees to work with new technologies, or the hiring of experts, especially for small agencies, up to 5 employees and only one branch, which were the most in the sample (65%). By introducing new technologies, such agencies take a slightly defensive stance because their motive is not to increase profitability or reduce costs, and the fear of competition and disintermediation can justify such an attitude. More specifically, there is a fear among small agencies that agencies that master new ICT faster could, in the long term, gain a competitive advantage over them and push them out of the tourism market, in the long term or entirely.

CONCLUSION

Dynamic movements in the tourist market and the rapid development of ICT technologies influenced the reshaping of the tourist market. The dominance of global distribution systems is on the decline, and the development of the Internet and the World Wide Web have changed distribution channels. The Internet has long been a low-cost channel for direct marketing and has contributed to erasing the differences in the geographic reach of global brands and small or local independent hotel chains and airlines. These "small" ones began to invest more and more in their websites and booking systems and became more independent from global distribution systems and travel intermediaries. Consequently, the tourism market is reshaping: instead of intermediation (global distribution systems), there is disintermediation (branded websites and booking systems). Online platforms, as systems, contain up-to-date information about popular tourist destinations and provide helpful tourist information that is in line with user preferences. The effects of more intensive use of computers and the Internet, electronic reservation systems, online systems for booking accommodation and reviews, global distribution systems, and, in general, electronic business in the work of agencies are multiple and consist of expanding the market, improving the placement of tourist arrangements, increased business efficiency, cost reduction, etc. In Serbia, out of a total of 239 agencies that were active in 2023, the research included 120 of them, which indicated the existence of solid statistical evidence (X2 = 96.983 at the significance level of 0.000) that agencies believe that the application of ICT in business increases competition in the tourism market. In addition, the agencies believe that they will satisfy a more significant part of their needs via the Internet, which is confirmed by Pearson's X2 test (25.691) at a significance level of 0.012 and with the help of Spearman's (p 0 0.88 and Kendall's (tB = 0.310)) coefficient correlation at the =.01 level of significance. Realizing the challenges of ICT, tourist agencies find their chance to offer their services through electronic distribution channels. The application of ICT increases competition, and traditional agencies will be pushed out of the market because they do not use modern ICT, which was confirmed by Pearson's X2 test (61.953) at the significance level of 0.00 and with the help of Spearman's (r = 0.283) and Kendell's (tB =0.310) coefficient at the significance level of the correction coefficient that the application of ICT increases the competition for the overall offer and the attitude that this modern technology in business contributes to greater profitability. A correlation was established at the significance level of 0.01 with the help of Spearman's (r = 0.246) and Kendall's (rB = 0.264) coefficients. However, Person's X2-test did not confirm this correlation at a statistically significant level. A correlation was also established between the attitude that ICT increases

competition and the attitude that its application contributes to reducing business costs. Small tourist organizations, with up to five employees and only one branch office, when monitoring and introducing ICT, do not expect an increase in profitability or a decrease in costs but have a skeptical attitude. Other agencies, from the sample, have a motive for introducing ICT due to the fear of increased competition and disintermediation, that is, the fear that those with more intensive application of ICT could dominate the tourist market for a more extended period.

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ENVIRONMENTAL FACTORS THAT DETERMINE THE DOMAIN OF THE ACCOUNTING PROFESSION IN BOSNIA AND HERZEGOVINA

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***Abstract**: Today, in addition to the executive function, accounting also has an advisory role in business organizations. Changes in the business environment of the company require raising the level of competence and responsibility on the part of accountants. Professional accountants cover a wide range of operations from commodity and financial accounting, tax and financial advisory. The accounting profession strives to ensure the shortest possible path of transformation of business practices and processes, without giving up the basic accounting principles. The aim of this paper is to present the influence of environmental factors, from the economic, legal, political, cultural and professional aspects, i.e. whether they are a „tailwind" or a „pain point" of the accounting profession in Bosnia and Herzegovina.. Regardless of the upcoming changes and challenges, this paper advocates the hypothesis that the accounting profession still has the greatest integrity in providing relevant information, which is crucial in making quality business decisions in the private and public sector.*

***Key words**: accountants, accounting profession, Bosnia and Herzegovina, environment factors*

***JEL classification**: M41*

1. INTRODUCTION

The lack of a clear and systematic response to the growing problems opens up again the issue of unfinished transition and reform processes. There is one doubt in Bosnia and Herzegovina: Are we still in the transition phase or are we already on the wrong track? However, starting from the fact that we are still in the process of transition, the accounting profession faces a number of challenges. The domain of its efficiency and effectiveness at the micro and macro level determines its role and importance. A competent accounting profession is one of the essential conditions leading to a modern system of financial reporting, which should result in a greater degree of understanding of the economic statements of economic entities. There is a key dilemma, is the environment a limiting factor in the accounting profession? The answer to this question can only be obtained if all the key factors of that environment are analyzed that affect the domain of the accounting profession.

2. PROFESSIONAL ACCOUNTANTS AS THE MAIN BEARERS OF THE ACCOUNTING PROFESSION

„The organization of accountants as a profession was preceded by the establishment of accounting firms. An independent accounting firm was founded by William Deloitte in 1845, while Samuel Price and Edwin Waterhouse jointly formed an accounting firm in 1867. Symbolic organization as a profession was established with the establishment of the Institute of Accountants of England and Wales in 1880 and the receipt of a Royal Charter. At the same time, with this act, the first designation of the accounting title "authorized accountant" was made. In 1882, the first professional organization in America was founded, which still exists today, called the American Institute of Certified Public Accountants. Four years later, the first license for the title "Certified Public Accountant" was granted in New York State. In this way, the accounting profession is formally recognized, because the Law states that the title of certified public accountant (CPA) will be awarded to persons who pass the state exam, now the exam for obtaining professional titles, and have three years of experience in this area, which has not changed until today. The demand for CPAs in America increased significantly twenty years later, when the US government imposed a war tax. The demand trend was intensified during the greatest world crisis of 1929-1933. and it continued with moderate intensity until today." (Novicevic, Milojevic, 2019, p. 9-10) Compared to others, the accounting profession belongs to the younger professions, created when the double-

entry bookkeeping system was established. The accounting profession experienced its greatest crisis during the „great“ economic crisis of 2008. This results in a great loss of credibility, and the profession is subordinated to the interests of the world oligarchy and big capital. The accounting profession organized in this way did not have the strength to satisfactorily serve the realization of business goals. Regardless of all the difficulties it faces, the accounting profession today represents the most important profession in the modern economy and society. It is precisely this function that it performs that is the guarantor of its future even today, in the era of the digital economy.

The challenges faced by the accounting profession in Bosnia and Herzegovina are:

1) application of legal regulations,
2) more and more unqualified accountants,
3) insufficient application of new, digital technologies.

It can be said that accountants are the main bearers of the accounting profession. Their work is important for both the public and private sectors. In the public sector, they generate fiscal policy. In the private sector professional accountant (Novicević, Milojevic, 2019, p. 14):

1) „participates in the management of the company by using knowledge and skills from economics, management and accounting, on the basis of the formed own understanding of business systems and the environment, poses challenging business questions to the management of the company, takes a pragmatic and objective attitude when solving current business problems and formulating, implementing and improvement of business strategy,
2) provides business advice to lower costs, increase revenue and reduce business risks,
3) directly manages the company through: drawing up business and financial budgets, determining management fees, supervising all issues related to the financial health of the company and providing security to the management so that all processes in the company function,
4) provides an insight into the extent to which achieved results are based on strategic, tactical and operational decisions,
5) maintains high ethical standards and helps the company to become ethical.“

A professional accountant should observe the following basic principles:

1) „Integrity - to be straightforward and honest in all his professional and business dealings.
2) Objectivity - not to allow bias, conflict of interest or excessive influence of others to override professional or business judgment.
3) Professional competence and due diligence - to maintain professional knowledge and competence at the required level with the aim of providing the client or employer with competent professional services based on current achievements in practice, legislation and techniques and to act diligently and in accordance with applicable technical and professional standards.
4) Confidentiality - to respect the confidentiality of information obtained as a result of professional or business relationships.
5) Professional conduct - to comply with relevant laws and regulations and to avoid any activities that would bring discredit to the profession.“ (Međunarodna federacija računovođa, 2018)

The AICPA prescribes the following ethical principles of professional conduct:

1) „Principle of responsibility - In carrying out their responsibilities as professionals, members should apply sensitive professional and moral judgment in all their activities.
2) Principle of public interest - Members should accept the obligation to act in a manner that will serve the public interest, respect public trust and demonstrate commitment to professionalism.
3) Principle of Integrity - In order to maintain and extend public trust, members should perform all professional responsibilities with the highest sense of integrity.
4) Principle of objectivity and independence - A member should maintain objectivity and be free from conflicts of interest in the performance of professional responsibilities.
5) The principle of due care - The member should respect the technical and ethical standards of the profession, to constantly strive to improve the competence and quality of services and to maximally enable members to assume professional responsibility.
6) Principle of scope and nature of services - A member in public practice should respect the principles of the Code of

Professional Conduct when determining the scope and nature of services to be provided.“ (AICPA, 2014)

According to the Law on Accounting and Auditing of Bosnia and Herzegovina:

1) „The accounting standards that are applied throughout the territory of Bosnia and Herzegovina are:
   a) international accounting standards (IAS), ie International Financial Reporting Standards (IFRS);
   b) accompanying instructions, explanations and guidelines issued by the International Accounting Standards Board (IASB).
2) Audit standards and principles of professional ethics of professional accountants and auditors that apply throughout the territory of Bosnia and Herzegovina are:
   a) international auditing standards (ISA);
   b) code of ethics for professional accountants;
   c) accompanying instructions, explanations and guidelines issued by the International Federation of Accountants (IFAC).
3) The standards from this article also include standards, instructions, explanations, guidelines and principles that IFAC and IASB adopt after the entry into force of this law.
4) The standards from this article apply to all private and public companies and other legal entities with headquarters in Bosnia and Herzegovina.
5) Exceptionally from the provisions of paragraph 4 of this article, and until the publication of international accounting standards for governments and other legal entities from the public sector, budgets, budget users and extrabudgetary funds will apply the valid regulations of the institutions, entities and Districts on accounting and financial reporting.“(Ministry of Finance and Treasury of Bosnia and Herzegovina, 2015)

Also, according to the Law on Accounting and Auditing of Bosnia and Herzegovina, the following professional titles in the accounting profession are prescribed:

1) certified accounting technician,
2) certified accountant,
3) authorized auditor.

The accounting profession aims to create a true picture of the financial reporting of business organizations. In the future, the accounting profession will be forced to increasingly adopt sophisticated technologies. This will mean that accountants must improve their skills. This doesn't mean that accountants will be replaced by technology in the era of artificial intelligence, but their role will change over time. The accounting profession is rapidly transforming due to the productivity optimization available through new technologies.

Accountants need to embrace new technology so that their role in the economy remains relevant. This means monitoring technological trends, optimizing and adapting accounting software to meet the needs of the company, openness to learning and accepting new technologies. It is important to emphasize the following:

1) new technologies will not replace accountants, they will support them,
2) accuracy and security of accounting operations will improve,
3) accountants will be able to provide better insight into financial statements,
4) the most effective accountants will be those who are open to change.

„As chief financial officers, professional accountants have oversight of all matters relating to a company's financial condition. This includes creating and leading the strategic direction of the business towards the analysis, creation and transmission of financial information. A description of the multiple roles of professional accountants in business is not complete without considering the duties that the profession has towards the general public. As a profession that has gained a privileged position in society, the accounting profession as a whole deals with a wide range of issues that have an angle of public interest. In the case of professional accountants in business, they not only have to maintain high standards, but also play a key role in helping organizations behave ethically. Professional accountants have always had to have a deep knowledge of existing professional and ethical standards and regulatory frameworks, as well as to regularly update and develop their capabilities to meet dynamic market changes and transformations around the world.“ (Jui, L. Wong. J., 2013) In accordance with the set goal of this work, a survey of accounting and finance employees was conducted in 20 companies in the area of the city of Bijeljina, and the results indicate the following:

1) the average accountant in the city of Bijeljina is a female person, with a university degree, older than 45 years
2) attach great importance to continuous education and attending seminars,

3) they strive to improve the role of the accounting profession as a protector of the public interest,
4) their role as strategy creators and business analysts is insufficiently valued,
5) the environment is highlighted as key in the formation of the credibility of the accounting profession.

Competent professional accountants in business are an invaluable asset to a company. Their knowledge enables a pragmatic and objective approach to solving problems. It is of great importance for management, especially in small and medium-sized companies. They help in the company's corporate strategy, give advice on how to reduce costs, improve your strengths and mitigate risks. As in other professions, accountants must demonstrate their relevance in the capital market and their ability to face and develop in accordance with new challenges. Public expectations from this profession and its holders are high. The value of professional accountants will also be measured by the responsibility they have not only to their organizations, but also to the public.

3. ENVIRONMENT AS A LIMITING FACTOR OF THE ACCOUNTING PROFESSION

Companies have an imperative to retain existing and conquer new markets. This imperative must be fulfilled in order to survive in an extremely turbulent environment. We are witnessing rapid technological changes. Globalization has neither reduced nor called into question the importance of the accounting function in modern business. The accounting profession, based on moral and professional values, is an important link in the organization and management of a company. However, the business environment is becoming more and more dynamic and, as such, focuses on events that require a higher level of knowledge and skills from accountants. „Technological advances have seen accounting roles shift from transaction-focused tasks to using data generated by technology to inform stakeholder strategies, resulting in a shift in skill requirements. The accounting profession has experienced significant changes in its adoption and use of new technology, which has become a catalyst for innovation.“ (Freeman, Wells, 2015, p. 67)

Environmental factors that determine the domain of the accounting profession are:

1) economic,
2) legal,
3) political,
4) factors of culture,
5) professional.

The economic factors of the environment that affect the accounting profession in Bosnia and Herzegovina are manifested through the representation of small, medium and large companies, as well as through the sophistication of users of accounting information. „Forced reorganization of business activity multiplied the number of small and medium-sized enterprises, but the tradition of greater regulation of accounting reporting remained. What has changed is the effort for greater harmonization with the international regulation of this area. Hence, international financial reporting standards (IFRS) and international accounting standards (IAS) were hastily introduced, as a replacement for part of state regulations. It was expected that this would provide the basis for a rapid inflow of foreign capital and the connection of our economy through small companies, as a force, to large foreign multinational companies. That didn't happen though. The economy was left with a mass of small businesses and the destroyed remnants of large enterprises. There was a huge gap between imports and small, almost frivolous in terms of structure and quality, exports. Accounting regulation for this situation becomes formally internationally acceptable, but real standards regulate areas of business that almost do not even exist here. This causes numerous problems in the understanding and application of adopted standards.“ (Puskarevic, 2019, p. 6-7)

Users of accounting information can be internal or external. Internal users of information are capital owners, management and leadership bodies, professional services and employees. External users are the state and its bodies, banks, statistical institutes, suppliers, potential investors. Based on the requirements of different business-interest groups, accounting information takes on a different form and dimension. They are created as a product of accounting information systems, which are the main sources of data and information needed for the decision-making and management process of the company. The degree of complexity of the accounting information depends on how educated the users are to interpret it correctly. In Bosnia and Herzegovina, banks use information from financial reports to the greatest extent. For banks, this information is crucial for obtaining company loans.

„The influence of the legal factor is manifested through the degree of detail of the accounting legislation. The tax legislation and its impact on the company's accounting reports are certainly the most important here. As we stated earlier, by taking over and putting into force the operation of

IFRS and IAS, the state formally renounced a good part of the regulation of the profession. However, state regulations still determine the obligation, form and structure of accounting reports, and the tax legislation, in parallel, the obligations regarding the preparation of reports for the purposes of assessing the fulfillment of tax obligations. Accounting laws regulate obligations regarding the organization of accounting in legal entities, obligations regarding reporting and ensuring the legal foundation of these processes. The legal system, therefore, is not an important constraint on the development of accounting standards by the accounting profession, and this is positive for international accounting bodies, which strive towards the growing harmonization of national accounting frameworks. However, when it comes to the correctness of the report, i.e. adherence to the principle of objectively informing users, here, as in other aspects of life, it cannot be said that legal norms are respected. The content of the report is quite far from the reality of the financial and business potential of the legal entity, which is presented through the reports. The level of crime and corruption is significantly encouraged and maintained through the formal correctness of the report. The legal system is unable to deal with corruption, which is stated daily in the reports of numerous institutions.“ (Puskarevic, 2019, p. 9-10) The Tax Administration supervises the activities of legal entities, all with the aim of checking whether the accounting operations are in accordance with the provisions of the relevant laws and regulations. However, there are certain contradictions in the work of this „institution“. Often in the public we can hear „a company without an employee made a profit of millions“. Also, we have the case that in the Republika Srpska, the biggest tax debtors are the state institutions, and the control of their financial reports is carried out by the state audit service. This shows not only the way these legal entities work, but also the way these „relevant institutions“ work, where financial statements give a „cosmetic“ picture of the legal entity's financial condition. All this affects the credibility of the accounting profession.

Bosnia and Herzegovina is in a continuous political crisis, a crisis of institutions and authorities. Constant political conflicts and delaying decision-making affect investments, growth and development. Overall, the political crisis and the business environment are deterring all those who think about where to invest their money. This impoverishes the economy and citizens even more. „In the previous period in Bosnia and Herzegovina, the political will of the dominant ethno-national elites to build and strengthen institutions and implement systemic reforms was generally absent. Ethnopolitical elites prioritized narrow particular interests, to the detriment of the general interest.“ (Blagovcanin, 2024)

The influence of cultural factors on the accounting profession is reflected in its independence, as well as the position of accountants in the social structure. The independence of the accounting profession is viewed in relation to state institutions and business owners. In relation to state institutions, it is not questionable, but on the other hand, many accountants are exposed to pressure to create financial reports according to the „wishes“ of the company owner. It can be said that the social status of accountants in Bosnia and Herzegovina is satisfactory, which should indicate the importance of the accounting profession in reform processes.

The Law on Accounting and Auditing of Bosnia and Herzegovina regulates the acquisition of professional titles in the accounting profession in the following way:

1) „For the accounting profession in Bosnia and Herzegovina, a unique program for obtaining qualifications and training is applied at the level of Bosnia and Herzegovina, in the same way and under the same conditions for the entire territory of Bosnia and Herzegovina.
2) The program is determined by the Commission, in accordance with IFAC standards and guidelines. Uniqueness of testing and certification is a key component of the program. Differences between entities and Districts in terms of testing are not allowed under any circumstances.
3) The Commission shall publish the program no later than three (3) months after the day of its formation.
4) The Commission also adopts and publishes program changes, if and when IFAC changes or supplements its standards and guidelines.
5) Persons, who join the accounting profession in Bosnia and Herzegovina after the entry into force of this law, may obtain the titles referred to in Article 5, paragraph 1 of this law only if they meet the requirements of the corresponding part or parts of the program.
6) In addition to the requirements regarding testing and certification, the program also contains the necessary conditions that candidates should meet in terms of: a) vocational education and work experience for the appropriate level of certification;

b) appropriate knowledge of legal regulations and the tax system of Bosnia and Herzegovina, which is proven through a written exam.

7) Training services for candidates for the accounting profession, in accordance with the program, are provided by companies from the private sector, professional bodies of educational institutions in Bosnia and Herzegovina, which meet the conditions established by the Commission. Upon completion of the training, the training organizer issues a certificate to the training participants about the number of hours and the program of the training provided. Attendance of training courses is not mandatory for candidates, but taking the test, as a component of the program, is mandatory for candidate certification.
8) Exams are conducted according to the program determined by the Commission, under the same conditions for all persons in Bosnia and Herzegovina. The preparation of the tests is carried out by the Commission, while the activities related to the administration of the tests can be transferred by the Commission to one or more professional bodies, whereby they will closely monitor the implementation of such activities.
9) Continuing professional education is included in the program in accordance with the instructions issued by the Commission, and is carried out by professional bodies.“ (Ministry of Finance and Treasury of Bosnia and Herzegovina, 2015)

CONCLUSION

Without accounting records, it is not possible to record business events, so without accounting you cannot do business. Accountants' work is not only about records, their support is vital for management as well. Precisely, what kind of strategic and tactical decisions will be made depends on that support, because they are based on financial reports. It is impossible to imagine the functioning of the economy without a competent accounting profession, as well as the state itself. That is why it is extremely important to identify and solve the problems that exist in this profession.

When it comes to environmental factors, which are described in this paper, it can be said that they are not completely limiting for the accounting profession in Bosnia and Herzegovina, but they represent a barrier to its domain and development. According to the survey mentioned in this paper, the respondents point out the environment and its factors as crucial for the prosperity of the accounting profession. That's why we have to work on arranging these factors, so that they don't stumble the accounting profession, but instead act as the „wind at its back“.

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THE IMPORTANCE OF INFORMATION SYSTEMS IN ACTUARIAL PRACTICE

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Abstract: *Information systems have become indispensable tools in actuarial practice due to their pivotal role in the analysis, interpretation, and prediction of financial risks. They play a crucial role, enabling actuaries to analyze vast amounts of data, identify patterns, and forecast future financial obligations. These systems are essential as they empower actuaries to make informed decisions regarding risk management and future financial obligations, such as pension plans and insurance. Through the utilization of information systems, actuaries can effectively assess financial risks, adjust management strategies, and provide relevant information to management and other stakeholders. This paper explores how actuarial practice utilizes information systems, emphasizing the importance of their role in decision-making and enhancing the financial stability of organizations. By analyzing existing information systems used in actuarial practice, we investigate their characteristics, advantages, and limitations.*

Keywords: *Actuarial science, actuary, information, systems, risk, management.*

JEL classification: *L86, G22*

1. INTRODUCTION

The primary role of insurance is to compensate policyholders when insured risks materialize. In order to fulfill its function, an insurer must ensure it has sufficient funds, based on collected premiums, to meet its obligations to policyholders at any given time without jeopardizing its liquidity.

Due to the importance of determining insurance premiums for both the insurance companies themselves and the policyholders who pay them, it is necessary to approach this task responsibly by utilizing statistical and accounting data processed with the help of information systems.

The paper analyzes the significance of information systems in processing data relevant for making insurance-related decisions, with a focus on the increasing involvement of artificial intelligence in modern society.

1.1. PROBLEM AND SUBJECT OF INVESTIGATION

The subject of the research paper is the application of information technology, large-scale data processing systems, and artificial intelligence in the field of insurance. It is important to focus on the work of actuaries in data processing to make correct decisions in determining premiums, ensuring the basic conditions of adequacy of tariff rates to minimize policyholders' expenses in the form of premiums while ensuring that the calculated premium covers insurer expenses and provides surplus income over expenditures.

1.2. RESEARCH OBJECTIVES

The research objectives are in line with the formulated problem and subject of investigation. The scientific objective is to examine the

significance of information technology and its application in insurance. The societal objective is to assess the challenges in the real insurance sector, including those faced by actuaries, and to identify any issues in implementing artificial intelligence. The contribution of this research will be reflected in evaluating the current state of the market, identifying the most important problems facing this field of insurance, and exploring possibilities for their resolution.

The first part addresses the fundamentals of actuarial science and information systems. The second part focuses on the various uses of information systems in actuarial science, while the third part is centered on the transformation of actuarial science through technological advancements.

The actuarial profession is one of the oldest occupations in the field of finance. The word "actuary" originates from the Latin word "actuarius," which referred to a clerk who kept records in the Roman Senate and was responsible for acts. Over time, this word has evolved from its etymological origins to acquire an entirely new meaning. Since the late 18th century, the term "actuary" has referred to professionals engaged in actuarial work in the modern sense of the word. (J. Kočović, M. Koprivica, D. Janković, 2018)

In all business domains, including insurance, informational support plays a crucial role. Actuarial tasks such as profitability calculations, tariff development, and reserve calculations require sophisticated information tools. Without adequate informational support, these tasks would be extremely difficult, if not impossible, to perform. This support encompasses everything from databases to specialized software tools designed specifically for actuaries.

Thanks to the development of computer technology and the integration of stochastic actuarial models with modern financial theory, actuarial science has undergone revolutionary changes, accompanied by changes in the actuarial profession. (J. Kočović, M. Mitrašević, 2010)

The value of an information system is not limited to computer technologies. Information systems have been present even before the emergence of computers and information technologies. With the advent of computers and the advancement of information technologies, the role of information systems in actuarial science has gained importance. It is crucial for different parts of the system to communicate and exchange information for the system to function efficiently. The efficiency of any system depends on the quality of its information support. The higher the quality of the information system, the greater the efficiency of the system, as it enables better communication among different parts of the system.

Actuaries play a crucial role in insurance companies, constantly assessing risks. To perform this task, actuaries have access to the company's information system. They determine the price of insurance products, calculate reserves, and strive to cover all damages that policyholders may incur in the future. Their main concern is the solvency of the company and finding ways to reduce risks. Additionally, they calculate profitability and form an optimal investment portfolio for the company using the law of large numbers and probability theory. Actuaries work with large datasets covering a sufficiently long time period. Such datasets are provided by information systems through a unified database within the insurance company, as well as data from institutions such as the Statistical Office and the Insurance Agency.

For many years, the insurance sector has been reluctant to change, proving to be one of the most conservative sectors. This was also due to the entry barriers represented by strict regulation, the complexity of the products offered and large capital requirements (M. Boyer and S.M. Nyce, 2011).

In recent years, digitalization has been assigned an increasingly significant role as a means of improving the design, development, and distribution of innovative insurance products and services through new digital platforms, ecosystems, and other digital distribution channels. There is a wide range of practices in the market, and the level of digitalization can vary significantly from one insurance company to another and can develop rapidly. (P. Hielkema, 2024)

Over the past decade, digital technology has become a driving force in the development of society and the global economy, causing radical changes in socioeconomic processes through its digitization. Digitalization now encompasses almost all aspects of human life. Furthermore, technologies are transforming digital ecosystems across all industries. They enhance and create new financial services to better meet the growing demands of clients. (D. Pauch, A. Bera, 2022)

Observing the changes in the digital world that affect society as a whole, we realize that we should rethink the degree of digitalization. Some processes, even despite technological advancements, are not or should not be digitized due to the high costs of such activities or the need for customers to break away from practices that function quite well and to which they are accustomed and attached. Digitalization also poses the risk of data leakage or loss, especially

personal data. Insurers are required to ensure the protection of personal data, as well as in cases of irregularities, as they are exposed to penalties, lawsuits, loss of customer trust, and damage to reputation. (A. Chojan, J. Lisowski, and P. Manikowski, 2022)

2. TYPES OF INFORMATION SYSTEM USAGE IN ACTUARIAL SCIENCE

The introduction of information systems in actuarial science represents a crucial step towards enhancing efficiency, precision, and risk management in insurance. These systems enable process automation, analysis of vast amounts of data, and prediction of future events, providing actuaries with powerful tools for making informed decisions. Through integration with other actuarial tools and systems, information systems become the foundation for a holistic approach to actuarial functions.

New, advanced tools are available that enable the processing and utilization of big data in ways that were not previously possible. These tools include data management capabilities and computer techniques such as predictive analytics and advanced algorithms that have significantly increased the speed and capacity of data storage. With rapid advancements in data availability and the development and expansion of advanced data analysis techniques, the insurance industry's interest in big data analysis opportunities is growing proportionally.

The first component of a digital strategy is the use of new technologies and their strategic role. Companies were able to describe which new technologies they wanted to apply in the future. (W. Becker, O. Schmid, 2020)

Most insurance companies are working in partwith old IT systems and need further investments to prepare people and systems for the digital world. Moreover, insurers need to define the future work environment for their employees and sales representatives (sales process, sales tools, etc.). (M. Eling and M. Lehmann, 2018)

The following will discuss various uses of information systems in actuarial science, highlighting how they contribute to improving insurance practices.

2.1. PROCESS AUTOMATION

Process automation involves using information systems to automate routine tasks such as data collection, processing, and analysis, as well as premium calculation and reserving. Process automation in actuarial science utilizes information systems and software to speed up routine tasks and enhance efficiency. This includes automating data collection and processing, premium and reserve calculations, as well as risk analysis. Through automation, actuarial processes become less susceptible to human errors and can be executed more quickly and efficiently. This technology enables actuaries to focus on analyzing complex scenarios and making key decisions, rather than spending time on administrative tasks.

Automation can also contribute to increasing the accuracy of actuarial assessments and adapting to changing market conditions and regulations. Through integration with other actuarial tools and systems, process automation becomes the foundation for effective risk management and business optimization for insurance companies.

2.2. RISK ANALYSIS

Information systems are used to analyze various types of risks, such as financial risk, mortality risk, health risk, and others, using advanced analytical tools and models. Risk analysis in actuarial science is a key component in assessing the likelihood and consequences of potential events. Risk is defined as uncertainty about the occurrence of a future event. In situations of uncertainty, there is doubt about our ability to accurately predict the future outcomes of our actions. (J. Kočović, T.R. Antić, M. Koprivica, P. Šulejić, 2021)

Using information systems and statistical tools, actuaries identify and assess various types of risks, including financial, operational, and others. This analysis enables insurance companies to understand potential losses and take appropriate measures to manage them. Actuaries study historical data, develop risk models, and conduct simulations to predict future scenarios. Risk analysis also involves assessing the probability of different events occurring, as well as their financial implications. Through this understanding, insurance companies can adjust their risk management strategies and minimize potential losses. This analysis is continuously updated to take into account changing market conditions and new information.

2.3. MODELING

Using information systems for the development and application of actuarial models that aid in risk assessment, premium calculation, reserving, and other actuarial functions is essential. Modeling in risk analysis is a key process used to develop

mathematical or statistical models to predict potential scenarios and their impacts on the organization. Actuaries utilize various types of models, including those used to assess events and their consequences, simulations, and optimization, to better understand risks and their business implications. These models are applied to different types of risks, such as financial, operational, actuarial, and others, to identify and quantify potential threats. Model development involves identifying relevant factors and variables, as well as quantifying them within the model to simulate possible outcomes. By using historical data to validate models, actuaries verify the accuracy and reliability of their predictions. Modeling enables actuaries to forecast future scenarios and assess the probability of certain events, allowing organizations to better understand their exposure and develop effective risk management strategies. Through continuous improvement and validation of models, organizations can increase the reliability and usefulness of their risk analyses, contributing to more efficient risk management and achieving business objectives. (Ida Panev, Marin Kaluža, 2022)

2.4. DATA MANAGEMENT

Data management in risk analysis is a key process that involves collecting, storing, processing, and analyzing various types of data relevant to risk assessment and management. Actuaries must ensure that errors in premium estimation often arise precisely due to inadequate data management used in calculations, data system vulnerabilities, their untimely availability, inadequate statistical grouping, inconsistencies with the basic assumptions of the methodology, and others. Often, errors can occur in the case of a small amount of data, short time series of data (e.g., not all damages have occurred), as well as poor data quality. Actuaries are aware that a premium assessed based on such inadequate data may be underestimated and will further imply incorrect management decisions, which may lead to the insolvency of the insurance company.

Actuaries use information systems and sophisticated tools for data processing to effectively manage large amounts of information. This includes data on policyholders, insurance policies, financial transactions, and other relevant information. The key aspect of data management is ensuring the accuracy, completeness, and reliability of the data to make risk analyses as precise as possible. Additionally, actuaries must also ensure the privacy and security of data in accordance with relevant laws and regulations. Data management enables actuaries to identify patterns, trends, and key risk factors based on available information. Through effective data management, organizations can better understand their exposures and develop risk management strategies tailored to their specific needs. This may involve adjusting product offerings, optimizing portfolios, or developing new business strategies. Ultimately, efficient data management enables organizations to make the right decisions, minimize risks, and achieve their business goals.

The increasing use of new technologies and pervasive digitalization have a significant impact on customer expectations, which was particularly evident following the risk of the pandemic (Covid-19). Key factors shaping modern customer expectations include constant connectivity to the online world, the ubiquity of social media, and the availability of technology for speech and image recognition. (D. Pauch, A. Bera, 2022)

2.6. PREDICTIVE ANALYTICS

Predictive analytics in risk analysis involves using data, statistical algorithms, and machine learning to forecast future events and identify potential risks. Actuaries employ advanced models and data analysis techniques to identify patterns and trends that may indicate future scenarios. This analysis includes gathering large amounts of data, such as historical loss data, demographic data, and financial data, to identify factors that may influence risk occurrence. Through the application of predictive analytics, actuaries can assess the likelihood of certain events occurring, as well as their potential financial implications. This enables organizations to take appropriate measures to protect against potential losses and optimize their operations. A key aspect of predictive analytics is continuously updating models and analyses based on new data and changing market conditions. Through these analyses, organizations can better understand the dynamics of risk and adjust their risk management strategies in response to changes in the environment. Predictive analytics also enables organizations to identify new business opportunities and optimize their business processes based on predicted trends and potential risks.

2.7. INTEGRATION WITH OTHER SYSTEMS

Integration of information systems with other actuarial systems and tools to ensure coordination and compatibility in operation

Integration with other systems in risk analysis involves the process of connecting information systems, software tools, and other technological platforms to enable efficient exchange of data and information. Actuaries use integration with other

systems to access various data sources and tools necessary for risk analysis. This integration may involve linking internal systems of insurance companies with external data sources, such as databases of regulatory bodies or financial institutions. Through integration, actuaries can access a wide range of information and resources necessary for assessing different types of risks and effectively managing them. An important aspect of integration with other systems is ensuring compatibility and interoperability between different platforms and systems. This enables the exchange of data and information without the need for manual interventions or data format conversion. Through integration with other systems, actuaries can enhance their risk analyses and develop comprehensive risk management strategies tailored to the specific needs of the organization. This integration also allows organizations to leverage the latest technological tools and resources to improve their operations and gain a competitive advantage in the market.

3. TRANSFORMATION OF ACTUARIAL SCIENCE THROUGH TECHNOLOGICAL ADVANCEMENTS

Transformation of actuarial practice through the implementation of information systems represents a crucial step towards modernizing and enhancing the insurance industry. With rapid technological advancement and increasing amounts of generated data, actuaries are increasingly relying on sophisticated technological tools to more efficiently analyze risks and make informed decisions. This transformation not only enables actuaries to address future challenges in insurance adequately but also paves the way for innovative approaches in risk management and providing better service to clients.

Digital transformation in insurance requires an innovative business model focused on customer needs, more connected products and services, new technologies, and real-time data. Clients also increasingly expect almost real-time interaction with insurers for submissions and claims, especially for customer care. (S. Radwan, 2019)

3.1. AUTOMATING PROCESSES

Process automation in actuarial practice is a key strategy for improving efficiency and accuracy in data processing and decision-making. By using advanced information systems and software tools, actuaries can automate routine tasks such as data collection, cleansing, and analysis, freeing up time for more complex analysis and strategic planning. This approach not only reduces the risk of human error but also speeds up processes, enabling insurance companies to respond more quickly to market changes. Implementing automation can also result in reduced operational costs, improved operational efficiency, and increased overall competitiveness of the company. However, it is important to note that automation requires careful planning and implementation to ensure that processes remain accurate, reliable, and adaptable to changing market needs and regulatory environments.

3.2. DATA ANALYTICS AND ARTIFICIAL INTELLIGENCE IN ACTUARIAL SCIENCE

Data analytics and artificial intelligence are increasingly becoming key factors in the transformation of actuarial practice. Through the application of advanced data analysis techniques, actuaries are able to gain deeper insights into complex risks and make informed decisions about managing them. Artificial intelligence, including machine learning and deep learning techniques, enables actuaries to predict future events and identify patterns that would otherwise remain undiscovered. These technologies not only improve efficiency and accuracy in actuarial practice but also open doors to innovative approaches in risk management and providing better service to clients. Considering the rapid technological advancement and the growing volumes of data being generated, data analytics and artificial intelligence are becoming indispensable tools for actuaries striving to remain competitive in the dynamic insurance sector.

CONCLUSION

The role of information systems in actuarial practice is becoming increasingly significant as the insurance industry faces growing challenges and demands for fast, accurate, and efficient risk management. This paper has explored various aspects and forms of using information systems in actuarial practice, highlighting their crucial role in improving efficiency, accuracy, and risk management. We have examined how information systems enable process automation in actuarial practice, reducing the need for manual intervention and allowing actuaries to focus on analyzing complex scenarios and making strategic decisions. This process automation contributes to increased productivity and efficiency, which is crucial for insurance companies aiming to remain competitive in the market. We have also explored how information systems facilitate analysis of large volumes of data and prediction of future events. By using sophisticated algorithms and machine learning techniques, actuaries can better understand complex risks and make more accurate assessments, contributing to better risk management and informed decision-making.

Additionally, we have investigated the significance of integrating information systems with other actuarial tools and systems. Integration enables a holistic approach to actuarial functions, contributing to better coordination and more efficient management of data and information.

In essence, information systems play a crucial role in the transformation of actuarial practice, enabling insurance companies to be more efficient, accurate, and innovative in addressing increasing challenges and market changes. This is a time of great change in the insurance industry, and information systems are key to achieving success in this dynamic environment.

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ECONOMIC IMPLICATIONS OF DIGITAL CURRENCIES: CHALLENGES AND OPPORTUNITIES IN DEMOGRAPHIC TRANSITION

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***Abstract**: In this paper, we explore the economic implications of digital currencies during demographic transition. Through the analysis of the impact on economic patterns and population dynamics, we aim to identify challenges and opportunities in various demographic contexts.Our interdisciplinary approach investigates how digital currencies shape consumption and saving patterns across different demographics, and how this affects economic activity and stability. We also examine their impact on migration patterns and transnational financial flows in an increasingly globalized economy. Moreover, we analyze the socio-economic consequences of adopting digital currencies for older populations and vulnerable groups. By considering factors such as access to technology and financial literacy, we highlight potential policy and practice strategies that can maximize the benefits of digital currencies while minimizing their negative consequences on economic and social equilibrium. Ultimately, our research aims to provide valuable insights that can inform decision-making and contribute to the widespread adoption of digital currencies.*

***Key words**: Economics, Digital Currencies, Demographic Transition*

***JEL classification:** J11, E0, E7, E52, G20*

1. INTRODUCTION

Digital currencies are the latest direction in the development of modern financial systems (Jakšić et al., 2022).). The rise of digital currencies has created a significant need to talk about their economic impact amid the digital revolution. What's particularly intriguing is how digital currencies intersect with demographic changes, as societies undergo significant shifts in population structures, birth rates, and aging demographics. This combination presents both challenges and opportunities that require careful analysis.

Digital currencies, such as popular cryptocurrencies like Bitcoin and Ethereum, represent a paradigm shift in financial transactions. Their decentralized nature, facilitated by blockchain technology, challenges the traditional roles of central banks and regulatory authorities (Dimitrijević, 2021). As these currencies gain momentum, they introduce a new dimension to economic dynamics that influences monetary policy, financial stability, and international trade.

However, societies around the world are experiencing demographic changes on an unprecedented scale. Declining birth rates, increasing life expectancy and changing labor force dynamics are shaping the socioeconomic landscape. Such changes pose challenges to traditional economic models, from pension sustainability to health care spending, and require innovative approaches to fiscal policy and social protection.

Against this backdrop, the interplay between digital currencies and demographic transitions becomes increasingly relevant. How do digital currencies affect the financial behavior of different demographic groups? What role do they play in enabling cross-border transactions in aging populations? Can they offer solutions to challenges such as financial inclusion and intergenerational wealth transfer?

Exploring the economic implications of digital currencies within the context of demographic transition reveals a multifaceted landscape that is complex and challenging. This paper aims to delve into the intricacies of this convergence, analyzing the challenges and opportunities it

presents for economies worldwide. By shedding light on these dynamics, we can inform policy discussions and guide strategic decision-making in an era defined by technological innovation and demographic change.

2. THE EMERGENCE AND EVOLUTION OF DIGITAL CURRENCIES

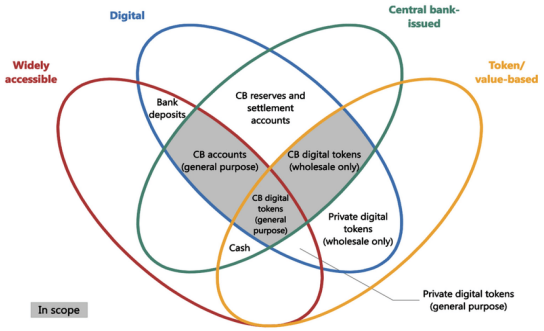
Cryptocurrencies, such as Bitcoin and Ethereum, have gained significant attention from various stakeholders, including investors, policymakers, and financial institutions, due to their increasing adoption since the emergence of Bitcoin in January 2009. Moreover, the academic community has also been showing a keen interest in studying cryptocurrencies (Grujić i Vojinović, 2014). The emergence of digital money has been described as a revolution, with many likening it to the industrial revolutions of the past (Adrian & Mancini-Griffoli, 2019). The new era of digital money has been driven by various factors, including advancements in technology and infrastructure such as crypto algorithms, distributed ledger technology (DLT), and widespread access to communication devices such as smartphones, tablets, and laptops. dditionally, there has been a growing demand for efficient and reliable financial services, as well as a need to respond to changing consumer behavior and evolving expectations. This new era of digital money has the potential to promote financial inclusion for various social and economic groups, including SMEs, previously unbankable individuals, and businesses in areas with limited banking services (IMF, 2020).

The process of development of digital currencies is multifaceted, it includes the emergence, growth and spread of new forms of digital assets used in the exchange of value. Although the origins of digital currencies can be traced back to earlier decades, significant advances in the fields of cryptography and distributed systems have enabled the creation of new decentralized currencies, such as Bitcoin, Ethereum and others. This process consists of several key phases. Firstly, there is a technological transformation that allows for the creation and distribution of digital currencies without traditional intermediaries like banks or central institutions. Subsequently, digital currencies start to gain attention as an alternative to traditional currencies, due to their features like decentralization, transparency, and limited supply (Vujević, 2023). Furthermore, digital currencies expand and are adopted across various sectors of society, including trade, investment, and financial transactions.

During this phase, new technological innovations such as smart contracts and decentralized financial platforms appear, which further enrich the system of digital currencies. Through this process, digital currencies have evolved into a complex and dynamic ecosystem that includes different types of currencies, technologies, platforms and applications. Although digital currencies have brought numerous innovations and changes in the way financial transactions are conducted, they also face challenges such as regulation, security and scalability. Despite all the challenges, the development of digital currencies continues to shape the future of the financial sector and society as a whole.

Cryptocurrencies offer a range of benefits that make them an appealing choice for payment. With the ability to provide a degree of anonymity akin to cash, they offer flexibility and freedom in financial transactions. In addition, the lack of geographical restrictions and the fast settlement of clearing make them ideal for cross-border payments. These advantages, combined with the absence of currency conversion costs, make cryptocurrencies a logical choice for anyone seeking a modern and efficient payment solution.

Figure 1. The classification of money forms based on four key aspects - "money flower"



Source: Cunha, P.R., Melo, P, Sebastião, H. (2021). From Bitcoin to Central Bank Digital Currencies: Making Sense of the Digital Money Revolution. Future Internet 13.

Figure 1 represents two main types of Central Bank Digital Currency (CBDC): retail and wholesale. Retail CBDCs can be account-based or token-based and are accessible to the general public. On the other hand, wholesale CBDCs are digital tokens with limited access that are used in wholesale. For transactions such as interbank payments or securities settlement. Account-based retail CBDCs are like commercial bank accounts, while token-based retail CBDCs are digital cash with similar. The idea of account-based retail CBDCs was proposed by Nobel laureate James

Tobin in the 1980s, who suggested that people should have deposits in the central bank to store value without the risk of bank failure.

3. CHALLENGES AND OPPORTUNITIES OF DIGITAL CURRENCIES

Digital currencies are transforming the modern banking industry. With their growing adoption, they possess the potential to revolutionize monetary policy. It is important for us to embrace the impact of this innovative financial tool and its impact on the banking sector.

The potential of digital currencies, specifically cryptocurrencies such as Bitcoin, to transform our understanding of monetary policy and banking systems cannot be overstated. With the inherent decentralization and security of digital currencies, they offer a myriad of advantages that traditional fiat currencies simply cannot match. The future is now, and it's high time we explore the thrilling possibilities presented by digital currencies (Badawil & Jourdan, 2020).

The widespread adoption of unregulated private mobile money by over 4 billion users, which has facilitated trillions of dollars in financial transactions, has raised concerns about the stability of the monetary system and the decreasing effectiveness of conventional monetary and fiscal policies. As a response, more than 100 central banks across the globe have initiated a concerted effort to develop retail Central Bank Digital Currencies (CBDCs), which will be accessible to all individuals. The primary aim of CBDCs is to provide stability and liquidity to the financial system during times of crisis. However, there remain uncertainties and challenges regarding the successful implementation of monetary and fiscal policies, particularly when it comes to achieving greater fiscal transparency without infringing upon individual rights and privacy (Vujović, 2023) While anticipated enhancements are expected, they may come with inevitable trade-offs in terms of the speed and effectiveness of monetary policy transmission.

According to Obradović et al.'s (2023) research analysis, the current impact of digital currencies on monetary policy is deemed insignificant. However, their potential should not be overlooked, as there is a need for more research and consideration globally. Digital currencies have the ability to influence monetary policy and the banking system in several ways. One significant example is the shift in the total money supply in the economy, whereby traditional money is gradually replaced by digital currencies as a means of payment. This transfer can have an impact on interest rates in the banking system if users decide to withdraw funds from traditional bank accounts and transfer them to digital currencies. Consequently, this can lead to a decrease in deposits, forcing banks to increase interest rates to attract new deposits or restrict lending, which directly affects monetary policy. The future impact of digital currencies on monetary policy is subject to speculation and cannot be predicted with certainty. However, based on available data and current trends, some tendencies can be identified, primarily in the continued and accelerated development of blockchain and DLT technologies, and the increased influence of digital currencies leading to a redefinition of monetary policy (Tomić & Todorović, 2020). Banks must actively monitor and initiate new research in the field of digital currencies to better understand their future impact on monetary policy. In any case, the development of technology requires alignment of regulatory frameworks and changes in the approach to conducting monetary policy.

Demographic transition refers to the process of changes in the demographic characteristics of a population (Wan Ahmad, Astina & Budijanto, 2015). Typically, it involves a shift from high rates of birth and death to lower rates, leading to changes in the age distribution and other demographic parameters. The process usually involves a decrease in the birth rate, an increase in the average lifespan, urbanization, and changes in social and economic patterns. The connection between demographic transition and cryptocurrencies can be complex and multidimensional (García-Medina & González Farías, 2020). Here are a few ways in which they can be linked: 1. Financial Inclusion: In countries undergoing demographic transition, there is a need for diverse financial instruments and platforms that enable individuals to manage their finances efficiently and securely. Cryptocurrencies can provide an alternative to traditional banking services and enable greater financial inclusion, especially for those who are less privileged or living in rural areas (Sarma & Pais, 2011). 2. Generational Wealth: Demographic transition can lead to changes in the distribution of wealth between generations. Cryptocurrencies can provide a new way to transfer wealth, especially between older and younger generations. For example, older family members may use cryptocurrencies as a means of transferring inheritance or providing support to younger family members. 3. Global Transactions: In a world where demographic transition often goes hand in hand with globalization, cryptocurrencies can facilitate the transfer of money between different geographical locations. This can be particularly significant for migrants who want to send money home to their families in developing

countries. 4. Fiscal Policy: Changes in demographic characteristics can impact government fiscal policy. Cryptocurrencies, especially if they become part of official transactions, can influence how governments deal with revenues and expenditures, as well as how social programs are planned and implemented. These connections between demographic transition and cryptocurrencies underscore the complexity and diversity of factors shaping modern financial systems and their relationships with broader social and economic changes (Smutny, Sulc & Lansky, 2021).

Adapting regulatory frameworks and institutional infrastructure to cater to changing demographics in the context of cryptocurrencies is a significant challenge. This requires developing new rules and regulations that govern the use of cryptocurrencies in various demographic contexts, taking into account the specificities of different population groups (Badawil and Jourdan, 2020). Ensuring adequate consumer protection and transaction security within the realm of cryptocurrencies is another major challenge, especially considering the evolving demographic structure of users. Therefore, developing effective mechanisms to protect against fraud, identity theft, and other abuses that could jeopardize financial stability and trust in cryptocurrencies is crucial.

Finding a balance between user privacy and the need for transparency and regulation in cryptocurrency transactions is also a key challenge. To achieve this, it is necessary to develop flexible approaches that enable privacy protection while also ensuring transparency and accountability in the use of cryptocurrencies, considering the diverse demographic characteristics and individual preferences of users.

Moreover, educating and raising awareness among users about the potential risks and benefits of using cryptocurrencies in different demographic contexts is essential. This calls for the development of effective educational programs and campaigns that inform users about safe cryptocurrency usage and promote responsible financial behavior across all segments of the demographic population.

Opportunities related to cryptocurrencies are favorable circumstances or potential benefits that can be realized through their use. Here are a few key opportunities to consider (Wilson, 2019):

- Financial inclusion: Cryptocurrencies provide an opportunity for those excluded from traditional financial systems to become included. This includes individuals without bank accounts or access to banking services, as well as residents of rural or less developed areas.
- Transaction efficiency: Cryptocurrencies enable fast and inexpensive transactions, especially for international payments. This can be particularly useful for individuals and companies looking to transfer money across borders or avoid high commission and currency conversion costs.
- Technological innovation: Cryptocurrencies are associated with blockchain technology, which has a wide range of potential applications in various sectors. This includes areas such as logistics, healthcare, smart contracts, and digital identity.
- Investment opportunities: Cryptocurrencies offer the opportunity to invest in new digital currencies or blockchain projects that have the potential for growth and profit. This can attract investors looking for new ways to diversify their portfolios.
- Enhanced privacy and security: Certain cryptocurrencies provide a higher level of privacy and security in transactions compared to traditional banking systems. This may be appealing to those who want greater control over their finances and data In essence, opportunities related to cryptocurrencies represent different ways in which their use can bring benefits to individuals, companies, and society as a whole.

In addition to the advantages mentioned earlier, there are several potential benefits to utilizing cryptocurrencies, including (Hameed, 2019; Al-Omoush, Gomez-Olmedo & Funes 2024):

- Decentralization: Cryptocurrencies can function independently without the need for a central authority, such as a government or bank. This can offer users greater control and autonomy while minimizing the risk of corruption or manipulation.
- Micropayments: Cryptocurrencies can enable small transactions that would otherwise be impractical or expensive using traditional payment methods. This can facilitate new business models such as pay-per-use services or content monetization.

- Community building: Cryptocurrencies can encourage a sense of community among users who share similar values or interests. This can lead to new forms of collaboration, innovation, and social impact.
- Transparency: Cryptocurrencies can provide an auditable and transparent record of transactions, helping to prevent fraudulent activities such as money laundering. This can also increase

Overall, the opportunities and benefits of cryptocurrencies are varied and constantly evolving as the technology and its applications continue to evolve. It is critical to carefully weigh the risks and challenges, such as volatility, regulation, and security, to make informed decisions and maximize the potential benefits (Garett, Emish & Young, 2023).

CONCLUSION

In summary, research on the impact of digital currencies amidst demographic changes has shown that there is a complex and dynamic relationship between technological advancements, economic shifts, and demographic transformations. This poses challenges that call for regulatory framework adaptations, institutional infrastructure adjustments, consumer protection and privacy measures, and user education on the potential risks and benefits of using digital currencies.

On the other hand, digital currencies present opportunities that include increased financial inclusion, transaction efficiency, technological innovation, decentralization, micropayments, community building, and transparency. These opportunities can help expand financial services to new segments of the population, facilitate global transactions, encourage innovation across various sectors, and promote accountability and transparency in financial systems.

To harness these opportunities and overcome the challenges, it is crucial to make wise regulatory decisions, develop effective consumer protection and privacy mechanisms, and implement educational programs and campaigns. Constant research and monitoring of trends in the field are also necessary to keep up with changes in demographic characteristics and technological advancements.

Ultimately, digital currencies are a vital aspect of modern financial systems and have the potential to significantly impact economic and social changes. By carefully considering the challenges and opportunities and applying appropriate strategies and measures, we can maximize the benefits of digital currencies while minimizing their negative effects (Shabbir, Perveen, Dad, Rehman & Ness, 2024).

Given the intricate nature of the interactional process, it is crucial to underscore the fact that digital currencies are just one aspect of the broader range of changes shaping the contemporary financial landscape. As demographic trends shift, digital currencies are increasingly gaining traction in economies across the world, reflecting the changing needs, preferences, and opportunities of various population groups.

To respond adequately to this dynamic, regulatory bodies, financial institutions, and technological companies must align their strategies and practices to effectively tackle the challenges and capitalize on the opportunities presented by this evolving landscape. This necessitates flexibility in policymaking, innovative approaches to consumer protection and innovation promotion, and public education about new financial tools and technologies.

Progress in this area requires the collaboration and partnership of various stakeholders, including government institutions, the private sector, the academic community, and civil society. It is only through joint efforts that a sustainable and inclusive financial ecosystem can be created that benefits all citizens, regardless of their demographic characteristics.

Digital currencies represent a crucial component in the transformation of financial systems worldwide. Their impact will continue to reverberate in the years to come, influencing how people manage their finances, invest their resources, and shape the future of the global economy. As such, continuous research, dialogue, and adaptation are essential to maximize the benefits of these innovations and mitigate their potential risks.

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INTERNET OF THINGS IN THE SERVICE OF DEVELOPING SMART CITIES

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***Abstract**: The Internet of Things represents a key technology that contributes to the digital transformation of business and society on a global level. The concept of the Internet of Things is described as a global network that emerges by connecting smart devices via the Internet, enabling their mutual communication, as well as communication with the environment. The subject of this paper is the role of the Internet of Things (IoT) in the development of smart cities. Smart cities represent an innovative approach to urban development aimed at improving the quality of life for citizens, as well as environmental protection. The paper starts from the hypothesis that smart cities today are not only a global trend but also a necessity, as the integration of IoT with existing infrastructure contributes to faster problem-solving and better decision-making that are significant for citizens' lives. The aim of this paper is to present examples of IoT application in the development of smart cities worldwide, as well as in Bosnia and Herzegovina. The research results indicate that the implementation of the concept of smart cities is recognized worldwide, but also that certain cities in Bosnia and Herzegovina have engaged in the process of implementing specific components of smart cities.*

***Key words**: Internet of Things, smart cities, technology, technological solutions, Internet, smart devices*

***JEL classification:** L63*

1. INTRODUCTION

The concept of the Internet of Things (IoT) emerged through the connection of objects to the Internet for the purpose of monitoring new physical states and communicating with other objects and people. This concept transforms physical objects such as various types of devices, vehicles, and the like into "smart" devices, enabling them to be connected and exchange data. The Internet of Things represents a new era of modern technologies, providing companies with the opportunity to reduce costs, increase revenues, transform business operations, discover new value, create new services, and business areas (Tomanović, 2017).

The concept of smart cities has emerged due to the growing trend of urbanization and the increase in urban population. This population growth poses new demands on urban infrastructure, while also raising questions about environmental protection, quality of life, and social inequalities. Nevertheless, cities serve as epicenters of economic, social, and cultural activities, increasingly relying on information and communication technologies to more effectively address these challenges.
The advancement of technology and smart devices, which communicate with each other, has enabled the prediction of consumer needs and the development of solutions to meet them. This also requires businesses to adapt to the new business environment (Tomanović, 2017).

Smart cities utilize digital technologies with the aim of improving the quality of human life and ensuring environmental protection. Additionally, one of the key objectives of smart cities is to attract a large number of new residents and visitors who will invest in the city, leading to an

improved quality of life and the development of a thriving economic environment. The need for smart cities is growing day by day, driven by the increasing population, as the resources of the land are limited. The concept of a smart city is presented as a solution to all the problems that current cities are facing or will face (Cvetković & Adamović, 2019).

The need for smart cities is constantly growing, with the concept of a smart city being presented as a comprehensive solution to all the problems current cities are facing or will face in the future. Connecting an increasing number of smart devices to the internet for remote management or minimal human intervention is becoming increasingly common practice. With the advancement of Internet of Things (IoT) technology, this integration is successfully applied in various sectors such as households, industry, healthcare, agriculture, and transportation, etc. The Internet of Things brings many benefits, but it also brings numerous challenges, threats, and risks that require attention from researchers. Although IoT applications are widely present, in our region, including Bosnia and Herzegovina, they are only beginning to spread.

In this paper, the authors will strive to present all relevant and available information about the development, implementation, and current representation of IoT technologies. Considering the speed at which these technologies are developing, all data and information provided in the paper may quickly become outdated. The research and data analysis in this paper are based on the collection and systematic analysis of literature from secondary data sources. These sources include the examination of relevant professional and scientific literature, published scientific papers, case studies, websites of relevant companies, strategic documents, as well as current business practices.

Based on the available information, the identification of the degree of presence of Internet of Things (IoT) solutions in the market of Bosnia and Herzegovina and globally is planned. By analyzing the current state of IoT in Bosnia and Herzegovina, opportunities for young innovators and new investors who want to be pioneers in the market with new, intelligent solutions can be identified.

2. INTERNET OF THINGS CONCEPT

The Internet of Things represents a new paradigm that has transformed traditional lifestyles into modern high-tech living. Over time, numerous research studies and analyses have been conducted to enhance IoT technology. However, there are still many challenges and issues that need to be addressed to realize the full potential of the Internet of Things (Kumar, Tiwari, & Zymbler, 2019).

Although there is significant interest in the Internet of Things worldwide, there is no single universally accepted definition of this concept. Different groups use various definitions to describe or promote their views on what the Internet of Things entails and what its most important characteristics are (Rose, Eldridge & Chapin, 2015).

Kumar and colleagues (2019) state that the Internet of Things is an emerging concept that enables communication between electronic devices and sensors via the Internet to enhance people's everyday lives. Smart devices and the Internet are used to provide diverse and innovative solutions for various tasks. This technology is becoming increasingly important in everyday life and can be applied in various aspects of the social environment. Overall, the Internet of Things represents an innovation that encompasses a wide range of smart systems, intelligent devices, and sensors.

The term "Internet of Things" (IoT) was first coined in 1999 by British technology pioneer Kevin Ashton to describe a system where objects in the physical world could be connected to the Internet via sensors. Today, the term Internet of Things is increasingly used to describe situations where internet connectivity and computing capabilities are extended to various objects, devices, sensors, and everyday items. Although this term is relatively new, the concept of combining computers and networks for device monitoring and control has existed for decades. By the late 1970s, commercial systems were already being used for remote monitoring of electric meters via telephone lines. At the internet conference in 1990, the first device connected to the internet was introduced - it was a toaster with remote control capability via an IP connection. In the following years, other devices also became equipped with IP connections. This included a vending machine for soft drinks at Carnegie Mellon University in the USA and a coffee machine in the Trojan Room at the University of Cambridge in the United Kingdom, which remained connected to the internet until 2001. Although the beginnings were playful, intensive research and development of "networks of smart objects" contributed to laying the foundation for today's Internet of Things (Rose, Eldridge & Chapin, 2015).

The IoT provides an ideal infrastructure for communication among devices to offer smart solutions for everyday problems. These devices are aimed at users, enabling home automation, connected healthcare, smart vehicles, and remote device monitoring (Khang, Gupta, Rani & Karras, 2024).

The diversity of smart IoT applications has completely transformed the world of networks. Smart finance, smart grids, smart healthcare, and other smart services are examples of these uses (Taherdoost, 2023).

2.1. CHALLENGES AND RISKS OF INTERNET OF THINGS IMPLEMENTATION

The Internet of Things opens up new exciting possibilities but also raises new questions about the interaction between people and organizations operating in the digital world. Some of these questions include the collection, processing, and ownership of citizens' data and the potential need to establish new legal or technical frameworks to exercise greater control over such a large and complex environment. At the same time, unnecessary restrictions on the development of the IoT market should be avoided (Božić, 2020).

The risks are diverse, ranging from customer data theft to industrial espionage and cyber attacks with serious consequences. They evolve and change rapidly, sometimes even daily. When it comes to implementing IoT solutions, cybersecurity must be a priority and developed from the very beginning. Only secure implementations can strengthen trust in the digital world, which is a key factor for sustainable provision of digital services to customers.

With the increase in connected devices, the opportunities to discover and exploit vulnerabilities in these devices also increase. Poorly secured devices can serve as entry points for cyber attacks, allowing malicious individuals to reprogram the device or cause it to malfunction. Such devices can also expose user data that individuals can misuse. Malfunction or a faulty device can also create a security vulnerability. These issues are significant, if not greater, for small, inexpensive smart devices than they were for computers, which traditionally served as endpoints in internet communication. The competitive price and technical limitations of these devices pose challenges for manufacturers in adequately implementing device security features, potentially creating long-term vulnerabilities greater than previously experienced with computers and their components. In relation to the highly interconnected nature of IoT devices, every poorly secured IoT device that is online potentially affects the security and resilience of the internet globally, not just locally. Take, for example, an unprotected refrigerator or another household smart device infected with malware; it could send thousands of harmful spam emails using home Wi-Fi, without the user's knowledge (Džanić, 2017). Data privacy is also a key pillar of trust. Many questions arise, such as what companies collecting data from IoT devices do with that information, whether they share or sell it to third parties, and what undesirable consequences could arise from the misuse of that data. It is clear that our personal data holds economic value, which raises concerns about how that data is used and whether there is potential for misuse (Džanić, 2017).

All these questions are of paramount importance as they are inseparable from ethical aspects, and their regulation within a legal framework is necessary. The key challenge arises from national legislations that apply within territorial borders, while the internet does not recognize such limitations. The transfer of data collected through IoT devices can lead to legal complications, especially concerning personal or sensitive data, opening up potential issues related to data protection and their transfer beyond the borders of national laws.

3. DEVELOPMENT OF SMART CITIES

The development of smart cities encompasses various aspects, including people, community, and technology. To truly be smart, a city must emphasize the importance of its people and community, not just technology. With the help of technology, a smart city has the potential to become more creative, improve governance, and enhance quality of life (Miah & Amin, 2020).

Lazović and Đuričković (2018) highlight in their work that the development of smart cities arises from two parallel processes that have spontaneously unfolded. The first process involves the emergence and proliferation of the Internet of Things (IoT), while the second process represents the transformation of the urban concept under the influence of the global digital economy. Due to the development of information infrastructure, it is no longer necessary to live and work in the central part of the city. Instead, the periphery becomes the focal point. Additionally, large cities with more than ten million inhabitants today function as information cities, and their survival is unthinkable without a strong presence of the information economy.

A smart city is one that is fully connected and equipped with technology to enhance the lives of its citizens. As wireless, Bluetooth, and sensor technologies have become more affordable, they are no longer limited to expensive devices such as

computers and mobile phones but are now used in almost all types of devices. This has resulted in every physical object being able to be equipped with advanced sensors and connectivity to become a smart object that generates a large amount of data (Cvetković & Adamović, 2019).

According to Grand View Research, the size of the global smart cities market was estimated at $748.7 billion in 2023 and is projected to grow at a combined annual growth rate (CAGR) of 25.8% from 2023 to 2030.

Increasing urbanization, the need for efficient resource management, public concern for security, and growing demand for energy-efficient environments are the main drivers for market growth. Due to the COVID-19 pandemic, countries have implemented strict isolation and mobility measures to prevent the spread of the virus. During the pandemic, the dependence of global economies on urban areas and the importance of public health protection in smart city initiatives were highlighted. However, organizations are attempting to implement new technologies such as the Internet of Things (IoT) and artificial intelligence (AI) to overcome the challenges they faced during the pandemic (Grand View Research, 2024).
Although smart city projects require a diverse set of technologies such as IoT, AI, and smart sensors for monitoring urban infrastructure, their implementation varies from city to city. Key drivers for implementing smart city solutions include the need to improve cities, reduce energy consumption, and concerns about increasing environmental waste (Grand View Research, 2024).

3.1. BASIC COMPONENTS AND APPLICATION AREAS OF SMART CITIES

To provide a detailed description of the broad picture found during the review of selected literature, we identified three platforms used to define the basic framework of a smart city. These platforms are: smart physical infrastructure, smart civic infrastructure, and smart digital infrastructure**.**

Smart physical infrastructure plays a crucial role in shaping the fundamental structure of smart cities. It provides the foundation for creating new and innovative solutions that enhance the quality of life in urban environments. Its purpose, among others, is to enable the development of smart housing, which encompasses all components related to the development of smart urban infrastructure such as smart homes, smart buildings, as well as the management and improvement of public services, including cultural activities, tourism, and education. In addition to smart housing, the purpose of smart physical infrastructure also extends to smart mobility. Smart mobility represents a strategy for citizens' movement using various forms of transportation in an intelligent manner. This concept involves the optimal utilization of different types of vehicles through precise information obtained from information and communication technologies. It focuses on reducing the use of personal vehicles, improving the efficiency of public transportation, and protecting the environment by reducing emissions and energy consumption. It is evident that urbanization has a wide range of effects, including increased energy demand, infrastructure construction, wastewater management, and ensuring clean water, significantly impacting the environment. However, the ecological impact of urbanization can be mitigated through appropriate planning of smart physical infrastructure, which enables greater efficiency and cost reduction in resource management.

According to Khang and colleagues (2024), smart civic infrastructure encompasses various key domains such as smart people, governance, economy, and lifestyle, with several key components. Smart individuals in smart cities utilize their knowledge to solve problems intelligently. This domain includes various elements such as human resources, digital education, community contribution, and public engagement. Smart civic infrastructure is not possible without smart governance.

Smart governance of cities utilizes information and communication technologies to improve decision-making processes and expedite administrative procedures. This involves better collaboration among various stakeholders, including public services, city officials, private companies, and citizens. This is achieved by providing innovative urban services and tools for citizens, such as mobile applications for participating in decision-making processes and collecting data of interest to smart communities (Bellini, Nesi & Pantaleo, 2022).

Bellini and colleagues (2022) in their work state that the smart economy uses information and communication technologies to connect local and global markets, enabling the provision of e-business and e-commerce services to increase productivity. Additionally, it includes the concept of the sharing economy, where individuals or companies offer services using their assets, as well as peer-to-peer marketplaces. Artificial

intelligence and machine learning techniques are used to build predictive models and improve recommendation systems for e-commerce in retail. NFC and wireless sensor technologies facilitate payment and transaction processes, while in some cities, such as Shenzhen, mobile phones replace cash and bank cards in everyday transactions.

IoT technologies and computing have a wide application in mobile healthcare, especially in remote patient monitoring, telemedicine, medication reactions, and community healthcare. These aspects become even more relevant during the COVID-19 pandemic. For remote monitoring, wearable or implanted devices such as cardiac devices, airflow monitors, and blood glucose meters are used, connected to the cloud via wireless sensor networks. This has led to the development of body sensor networks or wireless body area networks, enabling the integration of different data sources for collecting patients' biometric and physiological information for IoT healthcare applications. Smart hospitals also use IoT technologies to provide services to medical staff and patients, including patient identification and monitoring in hospitals and smart management of medical instruments that support decision-making processes (Bellini, Nesi & Pantaleo, 2022).

Khang and colleagues (2024) state that smart digital infrastructure builds interaction between residents and government employees and enables horizontal activity functioning. This platform encompasses vital domains such as smart networks, smart data, and smart sensors with numerous key components. Smart networks play a role in collecting, accumulating, and delivering information and data in any direction or location. The transmission and reception of simultaneous data are energetically synchronized with smart networks. Smart data is digitally collected via smart networks through various sensors, and the relevant data can be qualitatively processed, aiding in quick information processing. This domain includes components such as data resources, information linking, and data analysis. Finally, smart sensors analyze input data using predefined internal algorithms, eliminating unnecessary, processed, and unrelated data and sending it to the data center. This key component of smart networks records precise and automatic information.

3.2. SMART CITIES AROUND THE WORLD

The introduction of smart cities worldwide brings about a complete change in how cities function and deliver services to their residents. This global trend encompasses the application of advanced technological solutions to improve efficiency, sustainability, and the quality of life in urban areas. Smart cities are becoming symbols of innovation and transformation. In this chapter, we will explore some of the cities that stand out for their smart infrastructure and innovative solutions.

One of the best examples currently is Singapore, due to its significant efforts in daily data collection. Singapore launched its "Smart Nation" program back in 2014, where they implemented a large number of cameras and strive to add even more cameras so that the authorities can monitor the density of people in specific parts of the city and at appropriate times, as well as the cleanliness of public spaces, and even the movement of local vehicles at any given moment. Additionally, Singapore has an online platform called "Virtual Singapore" where most of the data is stored, allowing the authorities access to real-time information on how the city operates. Such information can help the government, for example, assess how people might react in the event of an explosion in a shopping center or how a disease might spread throughout the city. The goal is for Singapore to become a "Smart Nation" where people will live carefree and fulfilling lives, enabled by seamless technology that will offer exciting opportunities for all (Cvetković & Adamović, 2019).

Dubai boasts over 50 smart services and 22 governmental entities participating in the "Smart Dubai Initiative" administrative program. Additionally, the Dubai government offers the use of their "Dubai Now" application, where residents can pay traffic violation fines through the app. Cameras installed on roads record drivers who violate traffic rules and directly send fines to their email addresses. The same application allows residents to pay utility bills, call taxis, find the nearest ATMs, renew vehicle registration, or report law violations to the police (Cvetković & Adamović, 2019).

A third example is Barcelona. The implementation of the smart system includes smart street lighting that adjusts to the current situation, turning on if there are events on the road and turning off if the streets are empty. Parking sensors allow residents to immediately receive information via the application about available parking spaces at any given time, eliminating the need to circle and search for parking spots. Waste sensors, which are actually vacuum containers, allow garbage to pass through pipes underground and be stored. This solution solves the problem of noise from garbage trucks and significantly

reduces maintenance costs (Cvetković & Adamović, 2019).

4. APPLICATION OF THE INTERNET OF THINGS IN THE DEVELOPMENT OF SMART CITIES IN BOSNIA AND HERZEGOVINA

As in most countries worldwide, the population in Bosnia and Herzegovina is moving to large cities such as Sarajevo, Banja Luka, and Bijeljina. The reason lies in people's desire to secure a better life. Most cities in Bosnia and Herzegovina have abandoned areas, dysfunctional public spaces, deteriorating public buildings, and outdated residential neighborhoods. The increased energy consumption of these neglected buildings negatively impacts public budgets, exacerbates financial challenges for low-income families, and ultimately increases the city's ecological footprint. Taken together, this urban problem adversely affects the health, well-being, and quality of life of residents (UNDP in Bosnia and Herzegovina, 2020).

IoT is now used in almost all sectors of the economy, which is quite expected given the increasing level of digitization worldwide. In addition to providing speed and greater efficiency, as well as environmental protection, these technologies are also very profitable, which explains their popularity among large companies (Novaković, 2021).

Local communities in Bosnia and Herzegovina are increasingly recognizing the importance of digital transformation for the future. Aware of the costs and challenges of implementing "smart city" solutions, they actively seek partners to follow global trends and enhance the delivery of public services.

Street cameras are one form of IoT that is significant in our present time and also present in our region. These cameras function by automatically detecting anticipated violations depending on the parameters set, thanks to advanced software. Their major advantage is that they regularly report violations committed, thus enabling the swift and efficient punishment of offenders. Thanks to traffic cameras, which contribute to penalizing improper driving, pedestrians' lives are much safer. Additionally, the smart traffic light system works in conjunction with the technology equipped in many vehicles, alerting them to upcoming changes in traffic lights. This would help vehicles equipped with such systems to reduce waiting time at traffic lights. This application is most useful for emergency vehicles. It operates by the traffic control system registering approaching traffic at intersections and reacting in the best possible way to maintain the highest efficiency of vehicle flow. Research teams believe that by introducing smart traffic lights, the waiting time for drivers at light changes could be reduced by over 28 percent, and CO2 emissions by as much as 6.5 percent (Novaković, 2021).

Electronic toll collection is a wireless system for automatically collecting fees charged to vehicles using highways or specific bridges and tunnels. It is a faster alternative to traditional toll booths, where vehicles must stop, and the driver manually pays the toll in cash or by card. Vehicles using the system are typically equipped with an automatic device for such transactions. When a vehicle passes by a toll reading device along the road, the radio signal from the reader activates the transponder, which returns the identification number registering the vehicle's use of the road, and the electronic payment system charges the toll to the user. The main advantage is that the driver does not have to stop, reducing traffic congestion. The payment system usually requires users to pre-register and deposit money into an account with a reduced balance, which is debited each time they pass through a toll point. This payment system is much more economical and faster, significantly facilitating travel (Novaković, 2021).

The UNDP in Bosnia and Herzegovina and the City of Sarajevo launched the Smart Sarajevo Initiative, funded through the UNDP Country Investment Fund. The key objectives of the initiative were broad citizen participation and "community-owned city renewal"; leveraging technology to improve public services and urban infrastructure; and fostering SMEs, startups, and the private sector towards a knowledge-based economy (UNDP in Bosnia and Herzegovina, 2020).

Additionally, in Bosnia and Herzegovina, there has been the emergence of so-called Smart Home systems, which monitor and control everything happening in smart homes or apartments in real-time. One of the national telecommunications operators in Bosnia and Herzegovina, Mtel a.d. Banja Luka, offers Smart Home services to its clients with a monthly subscription fee of 5.99 KM and an equipment package priced at 99 KM. Smart Home systems include:

- The Mtel Smart Home application (available for Android OS version 5 and higher, as well as IOS version 10 and higher)
- A central unit that connects Smart Home devices

- Smart Home cloud services that enable control and management of systems from remote locations
- Smart Home devices that provide home automation management (Ilić, Damjanović, Katanić, 2023).

The need for smart cities is growing day by day. In the age of technological advancement, when our daily lives increasingly depend on innovations, municipalities and cities in Bosnia and Herzegovina are seeking their way to join key global initiatives.

The project "Smart Cities - Towards the Digital Transformation of Cities in BiH" was launched to support progress towards creating smart cities. It has been implemented since 2021 as part of the develoPPP.de program, and is carried out by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Federal Ministry for Economic Cooperation and Development of the Federal Republic of Germany (BMZ), in collaboration with companies LANACO and DVC Solutions, as well as the association of IT companies in BiH, Bit Alliance.

Prijedor, Zenica, and Tešanj are local communities that have received the gift of the smart GoParking application. The GoParking system uses modern technologies such as sensors and cameras to facilitate parking management. It enables quick finding of available parking spaces and payment via SMS or card. In Prijedor, this system covers around 250 parking spaces, and the number of payments via SMS messages has tripled.
Pale and Zvornik have implemented the Citizens Patrol application to improve the lives of citizens in urban areas. This application facilitates communication between local institutions and citizens, allowing them to anonymously report communal and other issues via their mobile phones. At the same time, it helps institutions to react quickly and solve these problems. The applications are available for users of Android and iOS operating systems.

In the area of the city of East Sarajevo and the municipality of East Ilidža, the Smart Public Lighting project was implemented as part of the EU Med Esmartcity project, implemented by the East Sarajevo Development Agency (RAIS). The system self-regulates and currently achieves energy savings of 47% compared to a conventional public lighting system, with a trend of increasing savings by 1% per month at this moment. An application has also been developed that enables monitoring and management of public lighting, adjusting the lighting levels to the needs, and measuring air pollution levels. The mentioned installation is a pioneering endeavor in this part of Europe and represents the first fully functional smart city service in the Western Balkans region, consisting of a hardware component in the form of sensor blocks for measuring specified parameters and a software component in the form of a data center for collecting and saving data, their classification, processing, and analysis using advanced artificial intelligence and machine learning algorithms. The established real-time system can monitor the following parameters: motion, illumination, and air quality parameters: temperature, pressure, humidity. Although it may not cover a large area, this project serves as an inspiring example of how cities can transform their environments into sustainable, inclusive, and smart communities that provide a high quality of life for all residents (Mastilović, 2019).

CONCLUSION

This paper defines the basic concept of the Internet of Things (IoT) and its role in the development of smart cities. The Internet of Things enables the interconnection of various devices via the internet and communication among them. With the expansion of IoT technologies in recent years, it is considered that the era of the Internet of Things is yet to come. IoT should be implemented in a way that users have complete trust in its application, in order to fully enjoy the benefits that this technology brings.

To keep pace with modern times, cities are adapting, giving rise to a new concept of city management called "smart city." The concept of a smart city aims to provide a better quality of life for every individual in the city, by integrating innovative and modern technological solutions for successful and high-quality resolution of all urban issues. Smart cities are described as cities that aim to increase the quality of life of every individual based on existing infrastructure, investments, and the application of smart solutions. Smart cities enable real-time monitoring and analysis of data, contributing to better decision-making and addressing the challenges faced by cities. The implementation of these technologies also encourages investment in the economy, creating new employment opportunities and enhancing the competitiveness of cities at the global level.
Living in large cities is challenging for residents and those responsible for creating favorable conditions for them. Cities are often designed without the capacity for the current number of inhabitants and their standard of living. Therefore,

cities must adapt and become "smarter," but these requirements change over time, necessitating constant adaptation and future prediction.

Based on a review of recent research literature, we have identified three platforms used to define the basic framework of a smart city. These platforms are: smart physical infrastructure, smart civic infrastructure, and smart digital infrastructure. These platforms make a scientific contribution by enabling a systematic approach to studying the fundamental elements of smart cities, and they represent a foundational concept that shapes the structure and functioning of modern urban environments, providing various opportunities for improving the standard of living and efficient resource management.

Smart physical infrastructure provides the foundation for developing innovative solutions that enhance the quality of life in urban environments, particularly through smart housing and mobility. Smart civic infrastructure, as a key area in smart cities, provides insight into various aspects of social, economic, and cultural life, emphasizing the importance of smart governance and the digital economy in improving the efficiency of urban processes.

With a focus on smart grids, data, and sensors, smart digital infrastructure is a crucial element for establishing interaction between citizens and authorities, enabling efficient data collection, analysis, and utilization to enhance everyday life in cities. Through systematic study of these platforms, it is possible to gain a deeper understanding of the complexity of contemporary challenges and contribute to the development of innovative solutions that will support sustainable urban development worldwide.

In addition, the paper identified numerous risks and challenges facing the Internet of Things (IoT). For the further development of IoT technology, it is crucial to focus on security, privacy protection, and building user trust. Ensuring authentication and authorization mechanisms for both users and devices, as well as controlled data transmission between various IoT devices and platforms, is important. Moreover, due to the potential collection of users' private information without their knowledge, it is necessary to devise mechanisms to protect this information while ensuring the accuracy and reliability of the data. Control over personal data, improvement of privacy protection technologies, and the development of methodologies and tools for managing user and object identity are also key aspects. Finally, building trust must be an integral part of the IoT system design.

The need for smart cities is growing day by day. With the development of information and communication technology, the Internet of Things is becoming ubiquitous in almost every industry, which will likely result in even greater adoption in the future. In Bosnia and Herzegovina, progress in the field of smart cities and IoT technology lags behind developed countries. Although some cities have recognized the importance and potential of IoT application, the implementation of smart urban solutions is still limited. However, there is optimism due to the increasing presence of this topic at forums and conferences, enabling the exchange of information and potentially leading to increased activity in the development of ideas and technological solutions. Bosnia and Herzegovina has the potential for advancement in many areas such as agriculture, meteorology, waste management, industry, public administration, and healthcare. However, to realize this potential, broader acceptance and support from municipal authorities are needed, as well as alignment of regulatory acts to create better conditions for project development and attracting investors and donors.

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