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Economics, Entrepreneurship and Management Research (EEMR) is a scientific journal in the field of economics, entrepreneurship, and management. EEMR strives to follow the latest trends, analyzes, and research in these areas. EEMR will also support research in the field of economics, microeconomics, and macroeconomics, labor economics, finance, entrepreneurship theories, entrepreneurial behavior, entrepreneurial strategy, entrepreneurial ventures, family business, social entrepreneurship, international entrepreneurship, strategic management, operations management, financial management, human resources management, marketing, business communications, leadership, organizational culture, organizational behavior, and other related topics. EEMR will accept theoretical and systematic review papers, but, largely, original research papers.

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Structure of the Investment Portfolio of the Insurance Sector in the Republic of Serbia

Anđelka Aničić[1]

Abstract: *Thanks to the time gap between the collection of premiums and the payment of compensation for claims, insurance companies collect and invest temporarily free funds of technical reserves and thus become one of the important institutional investors. This paper analyzes the structure of the investment portfolio of the insurance sector in Serbia within framework of the existing regulatory constraints that insurance companies must adhere to regarding their investments. The research indicates that quantitative restrictions investments reduce the set of investment options available to insurers. The conclusion of this paper is that technical reserves in the Serbian insurance sector were fully invested in the prescribed types of assets across non-life and life insurance companies.*

Keywords: *Investment portfolio, insurance sector, the Republic of Serbia.*

JEL Classification*: G11, G22*

1. Introduction

Insurers are among the top three institutional investors worldwide, along with pension funds and investment funds. In most countries, insurers invest the largest proportion of their portfolio in government bonds and fixed-income private bonds. Insurers' investment strategies and risk management practices permit them to invest in shares, real estate, other instruments such as loans, as well as more complex financial instruments. The portfolio mix varies across countries depending mainly on the nature of insurers' liabilities, insurers' risk appetite, and the risk profile of insurers within the industry. In the life industry, the share of bonds in insurers' investment portfolios is typically higher than the share in the

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non-life industry, due to the fact that investment in long-term bonds allows for a better matching of assets with their long-term liabilities (OECD, 2011:16). In non-life insurance, the assets and liabilities per insurance policy are short-term, while in life insurance they are long-term, which is a consequence of the nature of the insurance contract. Namely, in non-life insurance, contracts are up to one year, with the possibility of renewal if the need of the insured exists. On the other hand, the main characteristic of life insurance is long-term, because the contracts are concluded for a period of at least 10 years.

2. Literature Review

The issue of optimal investment for an insurance company has increased attention in recent years. Traditional portfolio choice theory is generally based on the model of expected utility maximization (EUM). The model is premised upon the assumption that decision makers are rational and risk averse when facing uncertainty (Guo, 2014:17).

Hipp and Plum (2000) presented a model for the optimal investment strategy of insurers. They demonstrated that insurers optimal portfolio is a function of their solvency status, risk aversion, and the correlation between the assets and the liabilities. Kočović et al. (2015) analyzed investment possibilities of insurance companies in Serbia in terms of the existing regulatory constraints and the financial market development level. They confirmed that investment constraints adopted by the regulator lead to a narrowing of the efficient set of investment opportunities and to a worsening of risk-return trade-off for insurance companies in Serbia.

For reasons of security and liquidity, insurance companies prefer to invest in debt securities. The choice of securities does not depend only on the goals that are to be achieved. Jakšić and Todorović (2018) pointed out that to a large extent, legal regulations limit the investment policy of insurers. According to them, the most pronounced restrictions are in life insurance.

Insurers mobilize financial resources from the premiums paid by policyholders and allocate apportion of these funds for investments after settling claims. At all times, an insurance company must be able to respond to clients' needs and have different types of investments to maximize benefits from those investments. Investing temporarily free technical reserve funds is usually strictly regulated by state, as policy, who receive compensation from these reserves in the event of insured realization, are deprived of the opportunity to control how and safely insurance companies invest these funds. As institutional investors, insurance company invest in government securities, loans, housing, real estate development, and other areas.

Insurance companies are considered as financial intermediaries by Piljan and others (2015) because insurance companies take resources from one sector and invest them in another sector. These institutions invest their clients' assets in a series of investments designed to generate returns.

Although in 2022 the insurance industry experienced negative real rates of return, positive trends in financial markets have allowed insurers to improve their investment performance in 2023. (OECD, 2024:31)

3. Materials, Methods, and Results

Investment of technical reserves in Serbia

The National Bank of Serbia (NBS) is the main regulator of the insurance market, so it has proclaimed the creation and maintenance of a safe and stable insurance market in order to protect the interests of policyholders and insurance users, as well as to provide insurance services and products in a quality and transparent manner.

The Insurance Law (Article 131) classify the forms of assets that can be acquired with the funds of technical reserves. In addition to prescribing the form of assets, specific rules relating to investment activities have also been adopted. Thus, the insurance company is obliged to invest the funds of technical reserves in accordance with the rules relating to the types of insurance for which it is registered, which arise from the nature of the risks covered by that type of insurance, i.e. from the structure of the related obligations. The objectives that an investment portfolio, created with the funds of technical reserves, should meet are as follows: (Insurance Law, Article 132):

- provide liquidity, security and profitability of the insurance company;
- settlement of insurance company's future liabilities and
- risk dispersion.

The Insurance Law emphasizes the security of settlement of obligations to the insured, i.e. the compliance of investment activities with the upcoming obligations. The insurance company is obliged to align the assets acquired with the funds of technical reserves with the nature of the insurance liabilities, in order to minimize the risk of changes in interest rates, exchange rates and other market parameters.

The NBS also prescribes the restrictions that must be respected when investing technical reserves funds in prescribed forms of investment. The conditions relating to these restrictions are specified in a document known as the Decision on Investment of Insurance Funds.

The provisions of the Insurance Law have created investment alternatives for making decisions on the placement of insurance funds, emphasizing that the funds are allocated separately for life and non-life insurance. However, insurers do not have complete freedom to invest, because their investment is additionally and more closely regulated by the Decision on Investment of Insurance Funds (Table 1).

Table 1. Quantitative limits on the investment of technical reserve funds in Serbia

Type of assets	*Quantitative limits (% of technical rezerve)*
Debt securities issued by autonomous provinces and local self-government units, as well as debt securities underwritten by any of the above	35% * in securities of the same issuer – 10%
Debt securities traded in the securities market in compliance with law, and issued by a legal person having the head office in the Republic of Serbia	35% * in securities of the same issuer – 5%
Debt securities not traded in the securities market if issued by a legal person having the head office in the Republic of Serbia	3% * in securities of the same issuer – 0,5%
Shares traded in the securities market in compliance with law	25% * in securities of the same issuer – 5%
Shares not traded in the securities market if issued by a legal person whose head office is in the Republic of Serbia	5% * in securities of the same issuer – 1%
Equity interests of undertakings having the head office in the Republic of Serbia	5% * in securities of the same issuer – 1%
Investment units of investment funds	- up to the level of technical reserve calculated for a class of life insurance referred and * in investment units of a single investment fund – up to 50% of those technical reserve
Immovable property and other proprietary rights on immovable property – if entered in the land registry or other public register in the Republic of Serbia, if they bring income, if their purchase price is determined in accordance with valuation by a certified appraiser and if they are not encumbered by a lien	- up to 30% of technical provisions of life insurance, and/or 20% of technical provisions of non-life insurance, provided that not more than 10% of technical provisions of life insurance and/or 7% of technical provisions of non-life insurance is invested in one and/or several spatially connected immovable properties which make up one whole
Bank deposits	- up to 20% of technical provisions of life and or non-life insurance may be deposited with banks having a head office in the Republic of Serbia, provided that no more than 5% of those technical provisions are deposited with a single bank.
Cash	- up to 7% of technical provisions of life insurance and/or 10% of technical provisions of

	non-life insurance, provided that the sum of deposits and funds in the accounts of one bank does not exceed 5% of technical provisions of life and/or non-life insurance

Source: Author's presentation based on the Insurance Law and the Decision on Investment of Insurance Funds

The investment portfolio of the insurance sector in Serbia

To protect interests of the insured and third damaged parties and to ensure timely payment of damage claims, insurance companies must allocate adequate technical reserves and invest these assets to maintain and increase their real value. This approach ensures that the undertaken obligations are fully and timely met, both now and in the future. To meet its liabilities, company must invest its assets by considering the risk profile and risk tolerance limits (qualitative and quantitative) while pursuing its investment policy. (NBS, 2024:16) Below are the investment portfolios of the insurance sector that were formed by the funds of technical reserves, separately for life and non-life insurance, on an annual basis, for the period 2018-2023.

Table 2. Structure of the investment portfolio of the life insurance sector in Serbia (%)

Year	Government securities	Real estate	Bank deposits and cash	Other	Total
2018	91,9	/	5,8	2,3	100,0
2019	92,8	/	3,5	3,7	100,0
2020	91,9	3,2	3,4	1,5	100,0
2021	92,1	3,1	3,2	1,6	100,0
2022	89,7	3,4	5,0	1,9	100,0
2023	90,9	3,4	4,2	1,5	100,0

Source: Author's calculation based on the NBS Annual Reports for 2018, 2019, 2020, 2021, 2022, 2023.

The portfolio of the life insurance sector gots simple structure. Between the two dominant investment alternatives, is a significant disparity in shares, indicating that confidence in government (government securities) outweighs confidence in the banking sector.

In 2023, the share of government securities is about 91%, and with banks deposits and cash, it reaches up to 95-96% of the value of the portfolio. Since government securities can be invested without restrictions, this category achieves absolute dominance in the portfolio structure. On the other hand, up to 20% of the technical reserves for life and non-life insurance may be deposited with banks headquartered in Serbia, provided that no more than 5% of these technical reserves are deposited a single bank (Decision on Investment of Insurance Funds, Section 3). During the review period, the share of this alternative is well below the legal maximum. Since 2020, real estate investments have appeared in the portfolio structure of life insurers (Table 2).

Table 3. Structure of the investment portfolio of the non-life insurance sector in Serbia (%)

Year	Government securities	Real estate	Bank deposits and cash	Technical provisions charged to coinsurer, reinsurer and retrocessionaire	Unearned premium receivables	Other	Total
2018	60,4	4,5	10,9	21,4	1,6	1,2	100,0
2019	66,2	4,1	13,0	14,1	0,8	1,8	100,0
2020	74,1	3,0	10,4	9,8	1,1	1,6	100,0
2021	76,0	3,8	8,1	9,2	1,2	1,7	100,0
2022	67,2	3,7	15,0	9,9	3,6	0,6	100,0
2023	64,7	2,5	17,3	12,0	2,9	0,6	100,0

Source: Author's calculation based on the NBS Annual Reports for 2018, 2019, 2020, 2021, 2022, 2023.

In 2023, the technical reserves for non-life insurance of all insurance companies in Serbia were predominantly covered by government securities (64,7%), followed by bank deposits cash (17,3%), technical provisions charged to coinsurers, reinsurers, and retrocessionaires (12,0%), unearned premium receivables (2,9%), and real estate (2,5%).

The structure of the non-life insurance investment portfolio is dominated by the share of government securities. Investing in this form of property has had an upward trend. In 2019, government securities accounted for more than two-thirds of the portfolio, and in 2021 they reached over three-quarters. In the observed period, the maximum share of government securities was in 2021 (76%), and then a downward trend during 2022 and 2023, with an increase in the share of deposits with banks. The share of real estate investments and unearned premium receivables is decreasing. Technical provisions charged to coinsurers, reinsurers and retrocessors recorded growth in 2023 after a long downward trend. (Table 3.)

4. Conclusion

The investment portfolio of insurance, derived from insurance premium funds, is used to cover risks and constitutes a major part of these companies' assets. Its volume and structure limited by regulatory requirements and opportunities in the financial, capital, and real estate markets.

Thanks to the forming and investing of technical reserve on the financial market, insurance companies appear in the role of institutional investors in countries. By investing the temporarily available funds, insurance companies are trying to obtain an adequate return in the form of interest and capital gain with possible little risk. The structure of their investment portfolio is conditioned by the purpose of insurance business, the level of development of the financial market, the types of insurance and the current legislation.

Considering the objectives and limitations required when forming an investment portfolio of insurance companies in Serbia, it can be said that insurers meet these criteria, given that both the life and non-life insurance sectors respect the regulatory framework. However, there is a need to diversify the portfolio for both sectors.

A key element in ensuring the financial stability of insurer the selection of optimal insurance portfolio structure that guarantees profit maximization based on acceptable risk levels.

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Struktura investicionog portfolija sektora osiguranja u Republici Srbiji

Anđelka Aničić

Apstrakt: *Zahvaljujući vremenskoj nepodudarnosti između naplate premija i isplate naknade za štete, osiguravajuća društva formiraju i ulažu privremeno slobodna sredstva tehničkih rezervi i na taj način postaju jedan od važnih institucionalnih investitora. U radu se analizira struktura investicionog portfolija sektora osiguranja u Srbiji u okviru postojećih regulatornih ograničenja kojih se osiguravajuća društva moraju pridržavati pri investiranju sredstava tehničkih rezervi. Istraživanje ukazuju na to da kvantitativna ograničenja ulaganja smanjuju skup investicionih opcija koja su na raspolaganju osiguravačima. Zaključak ovog rada je da su tehničke rezerve u sektoru osiguranja Srbije u potpunosti uložene u propisane vrste sredstava u društvima za neživotno osiguranje i životno osiguranje.*

Ključne reči: *investicioni portfolio, sektor osiguranja, Srbija*

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Analysis of Economic Social and Political Factors of Labour Migration

Jelena Milosavljević[1], Ana Anufrijev[2]

Abstract: *Labour migration represents a complex phenomenon in which individuals analyse their life opportunities to have better economic, social, and political conditions. This process, driven by the desire for higher incomes, improved educational prospects, and a better quality of life, can also be result of political instability and armed conflicts. On one hand, the economic benefits that migrants bring contribute to the development of destination countries through innovation and by problem solving such as labour shortages or the lack of specific educational profiles in the labour market. On the other hand, inadequately developed integration mechanisms can create challenges in terms of social cohesion and access to institutions that provide basic needs such as healthcare, legal protection, and education. Countries of origin, confronted with the "brain drain" effect, are increasingly relying on reintegration programs to reclaim their valuable human capital. The unification of migration policies, particularly within the European Union, is essential for establishing a coordinated approach to the protection of migrants' rights and for addressing challenges associated with migrants arriving from conflict-affected areas. This research also highlights the need for comprehensive strategies that integrate economic, social, and political factors, thereby stimulating sustainable social and economic development.*

Keywords: *Labour migration, "brain drain", migration drivers, migration policy*

1. Introduction

Labour migration represents a complex and dynamic process that involves the movement of the working-age population from one geographical area to another in search of better

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economic, social, or professional opportunities. This phenomenon has deep roots in human history. Labour migration has existed since the very beginnings of organized human communities. Even in prehistoric times, people migrated in search of better living conditions, food, and security. During the ancient period, migration was driven by the development of trade, conquests, and the expansion of large empires such as the Roman and Persian empires. Slaves, craftsmen, and soldiers were often forced to relocate to serve the economic and political interests of their rulers.

In the Middle Ages, migration was associated with the feudal system, where peasants often moved from one estate to another in search of better working conditions. Additionally, merchants and artisans traveled between cities and regions, contributing to the development of local economies. Large-scale migrations also occurred due to wars, epidemics, and natural disasters.

In the modern era, labour migration has become a key factor in shaping global economic and social trends, with a significant impact on labour markets, demographic changes, and social structures worldwide. According to data from international organizations, the number of international migrants continues to grow, with developed countries often being destinations for workers from less developed regions. This trend has been driven by globalization, technological advancement, and increasing demand for skilled labour.

One of the most important global trends is the rise in the migration of highly educated workers, known as the “brain drain.” Developing countries often lose professionals who leave in search of better working conditions and a higher standard of living, which can negatively affect their economic and social development. At the same time, developed countries benefit from the influx of skilled labour, which contributes to their technological and economic progress.

Although there is no internationally agreed legal definition of international migration, the United Nations Expert Group on Migration Statistics has developed a statistical definition to ensure that countries measure the same phenomenon. From a statistical point of view, international migration is defined as a change of residence from one country to another, encompassing both spatial and temporal dimensions. Although there are various factors or reasons for migration—forced or voluntary, regular or irregular migration, family reunification or employment—they are not essential for the statistical definition of international migration. Accordingly, an international migrant is considered to be any person who has changed their place of residence from one country to another, regardless of the nature or reason for the migration. (Migration Data Portal, n.d.)

This paper will examine key aspects of labour migration, including its causes, consequences, and global trends. It will highlight both the positive and negative sides of migration faced by destination and origin countries alike and provide insight into possible solutions and recommendations that countries are implementing to improve migration governance in modern society.

2. Materials and Methods

This paper employs a qualitative and descriptive research approach to analyze the economic effects of labour migration. Data was collected through the review of existing literature, including reports from international organizations such as the ILO, World Bank, and UN, as well as academic studies and policy papers. Comparative analysis was used to examine trends between sending and receiving countries. The study also incorporates statistical data to illustrate the scale and economic impact of labour migration globally. Case studies of selected countries were included to provide deeper insight into specific economic outcomes. The goal of the methodology is to identify patterns and offer evidence-based conclusions regarding the costs and benefits of labour migration.

3. Results and Discussion

Labour migration has significant and multifaceted economic effects on both sending and receiving countries. For receiving countries, migrant workers often fill labour shortages, particularly in sectors such as construction, healthcare, agriculture, and domestic work. This contributes to economic growth, increases productivity, and supports demographic stability in aging societies. Migrants also contribute through taxes and consumption, which further stimulates the economy. However, concerns are sometimes raised about downward pressure on wages and increased competition for jobs among low-skilled native workers, although empirical evidence on this is mixed.

For sending countries, labour migration can provide substantial economic benefits in the form of remittances, which often represent a critical source of household income and national revenue. These funds can improve living standards, support education and healthcare, and reduce poverty levels. On the other hand, the emigration of highly educated and skilled professionals—commonly referred to as “brain drain”—can negatively affect long-term development by weakening the domestic labour force and slowing down innovation. In response, some countries are adopting strategies to retain talent or encourage the return of skilled migrants through diaspora engagement policies.

Overall, while labour migration poses certain challenges, its economic benefits can be maximized through well-designed policies that balance labour market needs, protect migrant rights, and foster development in both origin and destination countries.

Causes of Labour Migration

Labour migration is a complex phenomenon that cannot be viewed through a one-dimensional lens. In today’s globalized world, the decision of an individual or group to leave their home country is driven by multiple causes and motivations. Migration is rarely random; rather, it is often the result of deep-rooted economic, social, and political disparities that shape people’s opportunities in life. Regardless of the specific reason, every population movement is essentially also a movement of labour, as migrants in destination

countries must rely on employment to secure basic living conditions. Without finding work, integration into society and meeting daily needs would be nearly impossible, making labour a central driver of the migration process. This is especially evident in environments where economic opportunities are the main basis for choosing a destination, and migrants are faced with the challenge of quickly adapting to the labour market in order to achieve a stable standard of living in a new social and economic context.

Economic Factors

The most prominent driver of labour migration is economic factors. In many countries—particularly those struggling with high unemployment rates, low wages, and inadequate working conditions—people are compelled to seek alternative sources of income. The extreme inequality in the distribution of wealth between developed and developing countries creates significant disparities in living standards. Workers from countries with limited opportunities often choose to migrate in search of better working conditions and higher earnings. Developed countries not only offer more stable labour markets but also provide opportunities for professional development that are often lacking in migrants' countries of origin.

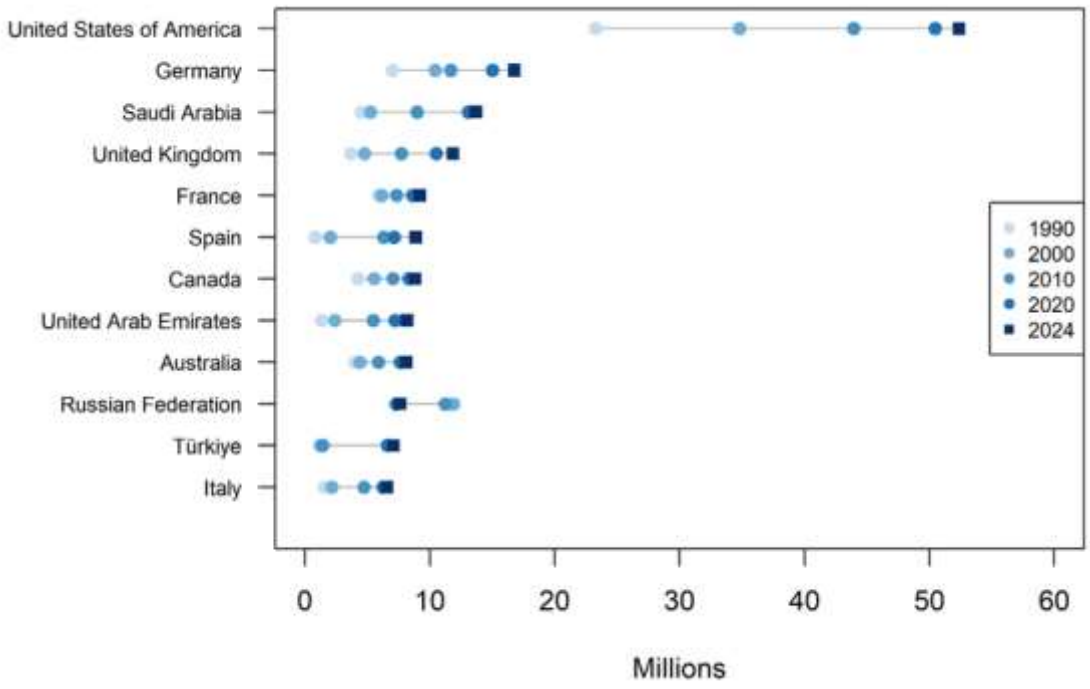
Globalization has further accelerated this process, as technological advancements and reduced communication barriers have made it easier to access information about global labour markets. Today, through the internet and international recruitment agencies, workers have access to job opportunities abroad. This mobility is especially pronounced among highly educated professionals, whose departure—known as the "brain drain"—poses a significant challenge for sending countries, but at the same time presents an opportunity for destination economies that aim to attract skilled workers through favorable working conditions and innovative incentives. Economic motives, therefore, are not solely about short-term financial gain, but also about long-term prospects for stable economic development and personal advancement in a country that offers better opportunities.

In 2024 (Figure 1), the United States hosted the largest number of international migrants, recording an impressive 52.4 million individuals. This figure reaffirms the U.S. position as the leading global migration destination, driven by its longstanding economic appeal. Germany ranked second, with 16.8 million migrants, highlighting the strong interest in the European labour market model, which offers high standards of social protection and economic stability.

Following these two leading destinations were:

- Saudi Arabia – 13.7 million, where migrant inflows are largely linked to investments in the oil industry and infrastructure projects;
- United Kingdom – 11.8 million, known for its dynamic labour market;
- France – 9.2 million, attracting migrants through its economic opportunities.

Figure 1 – Number of international migrants in the 12 leading destination countries, 1990–2024



Source: United Nations (2025)
The chart includes destination countries with 5 million or more international migrants.

Labour demand is becoming increasingly frequent, especially in sectors with challenging working conditions such as healthcare. The COVID-19 pandemic had a negative impact on this sector, which continues to suffer from workforce shortages. Other sectors, such as construction, information and communication technologies (ICT), and transportation, are facing similar issues. Transportation has long been affected by a worker shortage crisis. As the number of customer orders continues to grow, especially in the post-pandemic period, the demand for transport workers is steadily increasing, creating a mismatch between supply and demand.

Germany addressed the labour shortage issue as early as 2016 by introducing a special regulation known as the Western Balkans Regulation. This regulation allowed citizens of the Western Balkans—including those from Serbia—to access the German labour market more easily, provided they had a binding job offer and obtained approval from the Federal Employment Agency. The long-term validity of this regulation highlights its positive impact and the ongoing need for additional labour.

The negative effects of insufficient qualified labour are also reflected in the EU's initiative to introduce a new framework called the "European Skills Agenda", aimed at improving the quality of education and training, and promoting lifelong learning. The emphasis is placed on increasing the number of students in STEM fields (science, technology, engineering, and mathematics) and overcoming gender and social inequalities observed in

these disciplines. The new plan aims to improve citizens' employability, address the skills and labour shortages, increase business productivity, and ultimately enhance the EU's competitiveness.

Specifically, the European Skills Agenda aims to:

- Help people acquire basic and advanced skills;
- Encourage regular upskilling and reskilling;
- Facilitate employment across the EU;
- Attract and retain top talent in Europe;
- Improve the transferability of skills across the EU, thus increasing labour mobility within the Union.

The European Skills Agenda is part of the EU's ongoing plan to support skill development and improve people's lives. By adopting a people-centered approach, the initiative also aims to ensure that the EU remains competitive, backed by a large pool of the best available talent (EURES, 2025).

Equally notable is the fact that there are relevant indicators pointing to a significant increase in the number of foreign workers in Serbia. According to the National Employment Service, around 35,000 work permits were issued to foreign workers in 2022, with the number rising to over 52,000 in 2023. Most of these workers are employed in low-skilled sectors, particularly in construction, which includes major infrastructure projects such as road building, and in the transport sector. The largest number of workers comes from China, Russia, and Turkey, followed by India, Cuba, and neighboring countries. Given that Serbia is a signatory of the Global Compact for Migration, which aims to protect migrants and support sustainable development, it is reasonable to expect that the number of foreign workers will continue to rise in the future (Kamatica, 2024).

According to Predojević-Despić (2010), the initial drivers of international migration often differ significantly from the factors that contribute to its continuation and long-term establishment across time and space. While disparities in income levels, employment opportunities, economic risks, and market expansion initially motivate individuals to migrate, the dynamics of migration evolve as new factors emerge during the migration process itself.

Over time, a set of self-reinforcing mechanisms begins to influence migration patterns independently of the original causes. Among these are the development of migrant networks, which provide social, informational, and logistical support to new migrants; the emergence of institutional frameworks that facilitate the growth of transnational economic activities, such as remittance flows, circular labour migration, and diaspora entrepreneurship; and the transformation of the social and labour context in host countries, where migrants gradually become integrated into the workforce and local communities.

These newly developed conditions serve not only to stabilize existing migration flows but also to encourage their expansion. The growing presence of established migrant

communities lowers the psychological and financial barriers for future migrants, while institutional and policy adaptations in host countries—such as more flexible labour regulations or targeted recruitment programs—further embed migration within the economic and social systems.

Together, these changes give rise to a process known as cumulative causation of migration, whereby each successive wave of migration increases the likelihood of continued movement by creating favorable structural conditions. Migration thus becomes a self-perpetuating process, shaped not only by initial push-and-pull factors but also by the enduring transformations it triggers in both sending and receiving societies.

Brain Drain – Positive and Negative Aspects

"Brain drain" refers to the migration process in which highly educated and skilled individuals leave their home country in search of better working conditions, higher wages, and an improved standard of living abroad. The term was first used by the British Royal Society and described the exodus of scientists from the United Kingdom to the United States and Canada during the 1950s and 1960s (Balmer, 2009). This phenomenon is predominantly observed in countries facing economic, political, or social challenges. The loss of such talent can have long-term negative consequences for innovation, technological development, and the competitiveness of the country of origin. However, it can also bring positive effects to both the destination countries and the country of origin. In this context, establishing mechanisms to facilitate the return of emigrated experts is of vital importance for the home countries.

Serbia's most significant export resource is not steel or raspberries, as is often believed, but its labour force. As many as 15% of people born in Serbia live abroad, which is about five times higher than the global average of 3%. At the same time, remittances from the diaspora significantly contribute to the country's economy, amounting to an impressive 8% of the gross domestic product (Ozden, 2018).

Serbia has a long tradition of emigration, marked by several significant migration waves — from the departure of unskilled workers to Western Europe in the 1960s to politically and economically motivated emigration in the 1990s, during which many highly educated individuals also left the country. Today, the Serbian diaspora is spread worldwide, with two-thirds of emigrants moving to EU countries, and Germany being the main destination for more than 40% of them. Migrant remittances represent a substantial portion of Serbia's GDP, indicating strong ties with the homeland. Geographic proximity and improved travel conditions further encourage short-term and circular migration (Arandarenko, 2020).

Table 2. The positive and negative aspects brought by brain drain (The authors' adaptation)

Positive aspects	Negative aspects
· **Transfer of Knowledge and Technology** *Through the phenomenon known as brain circulation, emigrants bring new knowledge, advanced technologies, and innovative practices back to their home countries via international cooperation or return migration, which can enhance domestic institutions and the economy.* · **Economic Remittances and Investments** *Emigrants regularly send remittances that directly support family budgets and local economies. Additionally, successful expatriates often invest in projects in their home countries, creating new jobs and stimulating private sector development.* · **Global Connectivity** *Migrants establish international networks of contacts, providing access to global markets and resources. These connections can help promote domestic products and services worldwide, as well as attract foreign investment.* · **Improvement of Education and Research Systems** *The return of experts, enriched with experiences and knowledge gained abroad, can drive reforms in education and scientific research activities, setting new standards of quality and innovation.*	· **Loss of Key Human Resources** *The brain drain of highly educated professionals reduces the capacity of the home country in critical sectors such as science, technology, medicine, and education. This loss hinders the development of domestic innovations and creates a gap between labor market needs and the available workforce.* · **Reduced Economic Competitiveness** *The long-term loss of skilled personnel can slow down economic growth, as the ability to rapidly develop new technologies, innovations, and high-performance industries diminishes. This also leads to lower tax revenues and increased dependence on foreign expertise.* · **Demographic and Social Challenges** *Continued brain drain results in demographic imbalances, especially in sectors like healthcare and education, where the capacity to provide quality public services declines. This further burdens the social welfare system and reduces the overall quality of life.* · **Weakening of Institutional Capacities** *The shortage of highly qualified professionals affects the functioning of government institutions and academic centers, limiting the potential for innovative research and technological solutions. Consequently, this impacts the country's ability to compete globally.* · **Risk of One-Sided Migration Flows** *If migration becomes predominantly one-way and mechanisms for the return of emigrated experts are not developed, the country faces a permanent loss of potential, which can lead to long-term stagnation in key innovation and development areas.*

Brain drain carries both positive and negative aspects. On one hand, the migration of highly educated professionals can stimulate international cooperation, facilitate the transfer of innovations, improve the education system, and contribute to economic development through remittances and investments. On the other hand, inadequate control and the lack of reintegration strategies result in the loss of vital human resources, demographic challenges, and reduced competitiveness of the home country.

The key to successfully managing this phenomenon lies in establishing mechanisms that enable the return and active involvement of emigrated experts in the development of their home country. Strategic programs aimed at strengthening domestic institutions, improving the education system, as well as tax incentives and various forms of subsidies for returnees, can play an active role—balancing private benefits with social welfare.

In line with this, the official platform administered by the Government of the Republic of Serbia, Welcome to Serbia, provides various resources and information about immigration to Serbia. Additionally, at the end of last year, the Ministry of Health of the Republic of Serbia opened a dedicated office for cooperation with Serbian healthcare workers currently working abroad. Thanks to this initiative, 75 healthcare professionals have returned to Serbian medical institutions (Government of the Republic of Serbia, 2025).

Social Aspects

Social factors play a key role in individuals' decisions to leave their home country in search of a better life. These factors relate to all aspects of social life, from education and healthcare to social networks, cultural norms, and values. Below, we will examine in more detail the most significant social factors influencing labor migration flows:

- Social inequality and living standards
    - One of the main drivers of migration is the perception of inequality in the distribution of resources within society. In many countries, especially those with high levels of social inequality, a significant portion of the population lacks access to quality education, healthcare, and social services. These factors directly affect living standards, prompting individuals to seek better opportunities in countries with more developed social policies and fairer social systems. When basic needs—such as education, healthcare, and housing—are not adequately met, moving to countries with a higher standard of living becomes a logical strategy to secure a better quality of life for oneself and one's family.
- Educational factors and opportunities for personal development
    - The quality of education is one of the key social factors influencing migration decisions. In developing countries, the lack of quality educational institutions and limited opportunities for professional development may push young people to seek educational opportunities abroad. Various opportunities offered by destination countries—through formal education as well as acquiring new skills via informal training—significantly contribute to migration flows. Individuals investing in their knowledge and competencies often choose to move to countries that value innovation and expertise, thereby enhancing their prospects for professional growth.
- Family and social ties
    - Social and family connections play a decisive role in migration processes. Individuals who already have relatives or friends abroad are more likely to migrate because existing social ties provide support in navigating a new environment. Diaspora communities often act as a bridge between the home country and the destination country, facilitating integration through various forms of assistance, such as finding jobs, accommodation, and even legal advice. Furthermore, success stories of migrants who have improved their lives abroad motivate others, creating a chain migration effect.
- Security, healthcare, and social protection

    - Issues of personal security and healthcare are also critical social factors driving labor migration. In countries where health institutions, pension systems, and social protection are underdeveloped, individuals often seek destinations where they can reliably access these services. Better healthcare systems and developed infrastructure significantly improve quality of life and reduce daily risks, serving as additional motivation for migration. Moreover, social protection - which includes support during unemployment or other social crises - makes destination countries more attractive to workers seeking long-term stability.
- Cultural norms and social values
    - The cultural aspect of migration also carries weight. Social norms, values, and the general perception of a "good life" vary from country to country. Individuals often perceive countries with more liberal social norms as opportunities to realize personal ambitions, enjoy greater freedom of expression, and achieve individual identity. A culture of inclusiveness, tolerance, and pluralism—often found in developed countries—contributes to the attractiveness of those countries for migrants.
- Media influence and societal perception
    - Today, both the media and social networks play a significant role in shaping public perceptions of opportunities abroad. The globalization of information allows for rapid and wide distribution of images and stories about countries offering exceptional opportunities for work and life. Positive media portrayals and success stories of individuals who have fulfilled their dreams abroad create the impression that migration is the right solution for achieving personal and family ambitions. This constructed imaginary framework of a "better life" influences migration decisions and encourages those who feel limited in various ways in their home countries.

In this context, the Human Freedom Index (HFI) is the most comprehensive freedom index created so far for a globally significant set of countries and jurisdictions, covering 98.8 percent of the world's population. The index ranks countries over a period of more than two decades and uses 86 different indicators of personal and economic freedoms in areas including: Rule of Law, Security and Safety, Movement, Religion, Association, Assembly and Civil Society, Expression and Information, Relations, Size of Government, Legal System and Property Rights, Stable Money, Freedom to Trade Internationally, and Regulation. Based on the HFI, insights can be gained into areas needing improvement.

Figure 2. shows the top 10 countries with the highest ratings, while Figure 3. presents Serbia's ranking with a score.

Figure 2. Top 10 countries with the highest ratings

COUNTRY	HUMAN FREEDOM SCORE 2023
Switzerland	9.01
New Zealand	8.88
Denmark	8.83
Ireland	8.79
Sweden	8.75
Estonia	8.75
Iceland	8.73
Luxembourg	8.71
Finland	8.7
Norway	8.58

Figure 3. FGI Serbia

Ćosić & Poleti (2013) has found that international migration represents a strategy employed by social groups—most commonly households, families, and sometimes even entire communities—during times of economic hardship. Migration becomes a means through which households attempt to cope with structural transformations and market disruptions, a concept rooted in the new economics of migration. Large fluctuations in labor markets within these societies often lead to labor surpluses, while government responses tend to be limited, slow, and not always sufficient. As a result, families are

motivated to secure their livelihood independently, often by sending one or more members abroad to work.

Political factors

Labor migration and contemporary refugee flows are often the result of a combination of political and wartime factors that create unbearable living conditions in migrants' countries of origin. Political repression, authoritarian regimes, conflicts, and wars force people to flee their homelands in search of refuge and safety in countries that offer not only economic opportunities but also protection of human rights.

On the other hand, destination countries face numerous challenges in integrating migrants. A primary challenge is political inclusion. Migrants often arrive from conflict zones with traumatic experiences, which requires a tailored approach to their social integration. If local institutions are not adequately prepared to work with these groups, migrants may face discrimination, social isolation, and limited access to essential services such as education, healthcare, and legal protection.

In addition to institutional difficulties, political factors in destination countries can further complicate the issue. The rise of populist and nationalist movements often leads to societal polarization, where migrants are portrayed as destabilizing forces. Such rhetoric fuels tensions between locals and newcomers, creating an atmosphere of intolerance and prejudice, which in turn hampers integration and weakens social cohesion. In some cases, political initiatives aimed at restricting migration flows lead to tighter border control or restrictions on migrants' right to work, further marginalizing them.

One of the key challenges for destination countries is maintaining a balance between the economic benefits migrants can bring and the social costs of their integration. While migrants often fill labor shortages in critical sectors and bring a strong work ethic, poor integration can lead to the formation of parallel societies, reducing opportunities for collaboration and knowledge exchange. This contributes to rising social segregation and, in extreme cases, ethnic and political conflicts, which further destabilize the social fabric. Migrants are frequently forced to work under inhumane conditions for low wages, which may disrupt social relations by positioning them as cheap labor that takes jobs from locals and drives down labor costs.

A recent example of a migration crisis occurred in August 2024, when several European Union member states, particularly in Eastern Europe, experienced a sharp rise in attempts at illegal border crossings by migrants. In response, countries like Poland and Hungary tightened border controls to prevent mass inflows, which escalated political tensions and posed significant humanitarian challenges. The situation was further complicated by divergent political narratives, often centered around the question of priority—whether to protect national borders and security or to provide humanitarian assistance and ensure the proper integration of migrants.

This event highlighted the complexity of migration flows in modern Europe, clearly demonstrating how striking a balance between national security and humanitarian obligations is one of the key challenges facing EU member states. At the same time, it served as a catalyst for more intense discussions on the need for a unified European migration policy—one that would fairly balance the protection of national security with the commitment to safeguard human dignity and the rights of migrants.

Simeunović (2015) argues that migration has served as a catalyst for the revival of the nation-state within the context of a globalized European Union. Despite long-standing discussions about the decline of nationalism, the response to migration suggests that national identity and interests remain deeply embedded in European societies. The continued relevance of the nation-state shows that, even in a supposedly post-national era, nations still rely on their traditional structures to protect what they perceive as core interests.

This persistence is especially notable given that nationalism is often viewed as an outdated or even undesirable ideology within the EU. Yet, the reality shows a different picture—people continue to interpret the world not only as individuals but through the collective lenses of their national, ethnic, religious, or familial identities. As Ludwik Fleck once observed, while individuals may look at the world through their own eyes, they ultimately see it shaped by their group affiliations.

This contradiction between the EU's declared values of universalism and the practical resurgence of nationalism reveals a fundamental truth: human beings are inherently subjective and imperfect. No matter how much progress is made in terms of liberal democratic values or transnational cooperation, personal and collective biases remain influential.

Ultimately, even the modern, highly educated European citizen, who might outwardly support cosmopolitan ideals, may unconsciously prioritize national interests when faced with complex issues like migration. This reveals the tension between the theoretical ideals of European unity and the persistent pull of national loyalty, demonstrating that the transition beyond nationalism is far from complete.

4. Conclusion

Labor migration represents a complex phenomenon whose dynamics arise from the interplay of various factors—economic, social, and political. Economic motives are often encapsulated in the concept of "brain drain," which is typically viewed in a negative light. However, this perspective frequently overlooks the fact that brain drain can also have positive effects on countries of origin, such as through remittance flows, foreign investments, and the transfer of technology and knowledge—provided that mechanisms for the return of emigrants are put in place.

Social and political factors, often intensified by armed conflicts, further influence individuals' decisions to leave their homeland. In such contexts, destination countries face serious challenges in integrating migrants, especially those arriving from war-torn regions.

These situations require a multi-faceted approach that not only ensures the safety and legality of migration flows but also protects fundamental human rights and offers appropriate humanitarian assistance. Additionally, the polarization of public opinion and political rhetoric that emphasizes national interests can further complicate migrant integration and create tensions within host communities.

In addressing these challenges, a key element of any comprehensive migration strategy must be the establishment of effective return mechanisms for migrants. Reintegration programs that include employment opportunities, education, social and legal support enable returnees to contribute to the development of their communities with the knowledge and experience they have gained abroad. Such policies, often implemented in cooperation with the diaspora, not only mitigate the problem of brain drain but also bring valuable human capital back to the country of origin.

At the same time, there is a pressing need for a unified European migration policy, particularly in the context of migrations caused by armed conflicts. A common framework that balances the protection of national borders with international obligations to uphold human rights would enable more fair and effective management of migration flows within the European Union. Such a unified approach would not only alleviate the negative consequences of migration but also transform it into a force that strengthens and enriches society as a whole.

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Impact of Digital Transformation on the Efficiency of Business Communication in Hybrid Work Environments

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Abstract: *Digital transformation has revolutionized business communication, enabling organizations to adapt to hybrid work environments that combine in-office and remote work. Applications such as Zoom, Slack, Microsoft Teams, and project management software like Asana have transformed how teams exchange information, make decisions, and collaborate across geographical and cultural boundaries. This transformation brings significant benefits, including greater clarity, speed, and quality of communication, but also challenges such as information overload, communication breakdowns, and coordination within global teams. This paper explores how digital transformation impacts the efficiency of business communication in hybrid environments, with a focus on the role of organizational cultures, global teams, and strategies for optimization.*

Keywords: *Digital transformation, business communication, hybrid work, collaboration tools, organizational culture.*

1. Introduction

The rapid advancement of digital technologies has fundamentally reshaped the landscape of business communication, particularly in the context of hybrid work environments that blend in-office and remote work. The global shift toward hybrid models, accelerated by the COVID-19 pandemic, has necessitated the adoption of digital tools to maintain effective communication across dispersed teams. Platforms such as Zoom, Microsoft Teams, and Slack have become integral to organizational workflows, enabling seamless collaboration regardless of geographical boundaries. However, the integration of these tools introduces both opportunities and challenges, including enhanced clarity and speed of communication, as well as issues like digital fatigue and cultural misunderstandings in global teams.

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This paper aims to analyze the impact of digital transformation on the efficiency of business communication within hybrid work environments. It examines key dimensions—clarity, speed, and quality of communication—while addressing the advantages and challenges of the hybrid model. Additionally, it proposes strategies to optimize communication processes, drawing on organizational culture and technological infrastructure. The study is grounded in a review of existing literature and theoretical frameworks, providing a comprehensive understanding of how digital tools shape modern workplace dynamics.

2. Materials and Methods

To explore the impact of digital transformation on business communication, this study employs fundamental scientific methods, including analysis and synthesis. The analysis method is used to dissect the components of digital communication tools and their effects on clarity, speed, and quality, drawing on empirical data from reports such as those by Gartner and McKinsey. Synthesis is applied to integrate findings from diverse sources, including academic literature and industry studies, to form a cohesive understanding of the hybrid work environment.

Additionally, a descriptive approach is utilized to outline the advantages and challenges of digital tools, supported by case studies and theoretical frameworks such as media richness theory (Daft & Lengel, 1986) and cultural dimensions (Hofstede, 2001). This methodological approach ensures a balanced exploration of both practical and theoretical aspects of the research problem.

Clarity of Business Communication

Digital tools significantly enhance the clarity of business communication by providing pre-designed platforms for information exchange. Applications like Microsoft Teams and Slack, for example, allow communication to be organized into thematic channels, facilitating the tracking of discussions. Video conferencing tools like Zoom support nonverbal communication, such as facial expressions and gestures, which helps convey subtler messages that might be lost in text-based communication (Daft & Lengel, 1986). According to Gartner (2024), 70% of managers report improved communication clarity due to digital tools, as they enable more precise documentation and transparency.

However, clarity can be compromised by information overload. The high volume of messages on platforms like Slack can create “information noise,” making it difficult to identify key information. Technical issues, such as poor video quality on Zoom, can also hinder understanding. Organizational cultures further complicate the situation: in precision-oriented cultures like Japan, communication is often detailed, while cultures like the U.S. favor shorter messages (Hofstede, 2001). To address these challenges, organizations should establish clear protocols for tool usage and adapt communication to the cultural norms of teams.

Speed of Business Communication

Digital transformation significantly increases the speed of business communication, which is particularly important in hybrid and global teams. Tools like Slack enable instant messaging, while Zoom and Microsoft Teams support real-time meetings without the need for physical presence. McKinsey (2023) shows that 80% of companies experience faster decision-making processes due to digital tools. Asynchronous communication via Slack allows employees to respond at their convenience, while tools like Asana automate task tracking, reducing the need for lengthy email threads.

However, excessive speed can have negative consequences. Constant availability and expectations for immediate responses increase pressure on employees, potentially leading to stress and reduced productivity. In global teams, different time zones further complicate synchronous communication, often requiring asynchronous solutions that can slow decision-making. Organizations can mitigate these issues by encouraging asynchronous communication for non-urgent tasks and defining "quiet periods" during which employees are not required to respond.

Quality of Business Communication

Digital tools have an ambivalent impact on the quality of business communication. On one hand, Zoom supports video meetings that closely resemble face-to-face interactions, while Microsoft Teams enables real-time document sharing and collaboration, enhancing teamwork. Tools like Grammarly or AI integrated into Microsoft Teams assist in writing clearer and more professional messages. Cultural diversity in global teams further enriches communication, fostering creativity and innovation through diverse perspectives (Meyer, 2014).

On the other hand, quality can suffer due to the lack of informal communication, which is common in office settings. Virtual meetings are often task-focused, leaving little room for spontaneous conversations that strengthen interpersonal relationships. A study by Ter Hoeve et al. (2022) shows that 45% of employees experience fatigue from excessive video calls, reducing engagement and performance. Additionally, language barriers and cultural misunderstandings in global teams can hinder communication. For example, the direct communication style of Western cultures may be perceived as rude in cultures that value nuanced, careful speech (Meyer, 2014).

Digital tools enable sustained connectivity in hybrid work settings. The study highlights that digital communication platforms, such as video conferencing and instant messaging, are critical for maintaining social and professional connections when physical interactions are limited, enhancing communication efficiency in hybrid work environments. Frequent use of digital communication mitigates isolation. Regular use of tools like Zoom and email helps remote workers feel connected to colleagues, reducing feelings of isolation and supporting collaboration in hybrid teams (Nguyen et al., 2022).

Advantages of the Hybrid Model in the Context of Digital Transformation

The hybrid work model, combining remote and in-office work, fully leverages the benefits of digital transformation. Flexibility allows employees to choose the environment best suited to their tasks, increasing productivity and work-life balance (Gallup, 2023). Digital tools like Microsoft Teams and Zoom enable seamless collaboration between employees in different locations, while reduced commuting saves time and costs. The hybrid model also makes organizations more attractive to young talent who value autonomy (LinkedIn, 2023). Digital technologies, such as AI-driven communication platforms, significantly reduce communication latency in hybrid workplaces, enabling faster decision-making (Brynjolfsson & McAfee, 2022).

Hybrid work benefits from digital platforms that integrate video, chat, and project management, fostering real-time collaboration. Digital transformation enables asynchronous communication, critical for global hybrid teams across time zones (Chui et al., 2023). Digital tools like collaborative platforms reduce communication barriers, enabling faster problem-solving in hybrid teams (Kane et al., 2022). Real-time analytics in digital tools help managers optimize communication strategies for hybrid teams. Virtual reality and augmented reality tools enhance immersive communication experiences in hybrid settings (Davenport & Westerman, 2022). Asynchronous communication platforms reduce meeting fatigue, enhancing efficiency in hybrid work. A digital mindset fosters adaptability, critical for leveraging communication tools in hybrid environments. Virtual collaboration tools improve inclusivity, ensuring remote workers' voices are heard (Leonardi & Neeley, 2023).

Challenges of the Hybrid Model and Digital Communication

Despite its advantages, the hybrid model and digital communication present significant challenges. Coordinating teams across different locations can lead to misunderstandings, especially if meetings favor in-office employees over remote workers (Harvard Business Review, 2022). Technical issues, such as unstable internet connections or software glitches, disrupt productivity, while cybersecurity becomes a priority for protecting data outside the office environment (Gartner, 2023). Maintaining company culture is an additional challenge, as remote employees may feel less connected to the team, impacting engagement and loyalty (Forbes, 2023).

Over-reliance on technology without human oversight can disrupt communication flow in hybrid workplaces (Kane et al., 2022). Digital communication strategies must address equity between remote and in-office workers to ensure efficiency (Nicolaisen & Wilkinson, 2025). Digital transformation requires cultural shifts to prioritize communication efficiency over traditional methods (Rometty, 2022). Digital communication tools must be strategically implemented to avoid inefficiencies in hybrid work (Saldanha, 2023).

3. Discussion and Recommendations

Strategies for Optimization

To maximize the efficiency of business communication in hybrid environments, organizations can implement the following strategies:

1. **Clear protocols for tool usage**: Defining when to use Slack for quick messages, Zoom for in-depth discussions, or Microsoft Teams for document collaboration reduces communication errors and improves clarity.
2. **Employee training**: Training on the effective use of digital tools and cultural sensitivity helps employees leverage advanced functionalities and understand diverse communication styles.
3. **Balance of synchronous and asynchronous interactions**: Encouraging asynchronous communication for non-urgent tasks and limiting the duration of Zoom meetings reduces pressure and digital fatigue.
4. **Virtual informal activities**: Organizing "virtual coffee breaks" or team events via Zoom strengthens interpersonal relationships and maintains company culture.
5. **Technological support**: Investing in reliable infrastructure and tools with features like real-time translation facilitates communication in global teams.
6. **Feedback loops**: Regularly collecting employee feedback enables the adaptation of strategies to specific team needs.

4. Conclusion

Digital transformation profoundly impacts the efficiency of business communication in hybrid work environments, bringing benefits such as greater clarity, speed, and quality of communication, but also challenges like digital fatigue, information noise, global team coordination, and cultural barriers. The hybrid work model, supported by digital tools, enables flexibility and productivity but requires careful management of both technology and company culture.

Through thoughtful strategies, such as clear protocols, training, and fostering a balance between productivity and employee well-being, organizations can maximize the positive impact of digital transformation. In the future, the development of AI-based tools and personalized platforms could further enhance communication, provided there is a careful balance between technological innovation and human needs.

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Uticaj digitalne transformacije na efikasnost poslovne komunikacije u hibridnim radnim okruženjima

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Apstrakt: *Digitalna transformacija je revolucionisala poslovnu komunikaciju, omogućavajući organizacijama da se prilagode hibridnim radnim okruženjima koja kombinuju rad u kancelariji i na daljinu. Aplikacije kao što su Zoom, Slack, Microsoft Teams i softver za upravljanje projektima poput Asana transformisali su način na koji timovi razmenjuju informacije, donose odluke i sarađuju preko geografskih i kulturnih granica. Ova transformacija donosi značajne koristi, uključujući veću jasnoću, brzinu i kvalitet komunikacije, ali i izazove kao što su preopterećenje informacijama, prekidi u komunikaciji i koordinacija unutar globalnih timova. Ovaj rad istražuje kako digitalna transformacija utiče na efikasnost poslovne komunikacije u hibridnim okruženjima, sa fokusom na ulogu organizacionih kultura, globalnih timova i strategija za optimizaciju.*

Ključne reči: *Digitalna transformacija, poslovna komunikacija, hibridni rad, alati za saradnju, organizaciona kultura.*

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How Industry 4.0 is Shaping the Role of the HR Manager – A Review of the Contemporary Research

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Abstract: *Industry 4.0 represents the Fourth Industrial Revolution, based on digitalization, automation, the use of artificial intelligence, the Internet of Things, and big data analytics. These technologies are transforming business processes and have a profound impact on human resource management. The aim of this paper is to systematically analyze the impact of Industry 4.0 on the changing role of HR managers, to identify which new competencies are becoming essential for HR professionals, and to examine how these changes affect organizational structures. Tools such as AI, People Analytics, and automation enable the optimization of recruitment, training, employee evaluation, and workforce planning, while at the same time posing challenges related to digital skills, change management, and the legal and ethical considerations of data usage. Particularly significant is the shift in the perception of employees — from "performance monitoring" to "supported autonomy".*

Keywords: *Industry 4.0, human resource management, HR managers, artificial intelligence, automation, digital skills, organizational change, data ethics.*

1. Introduction

Rapid technological development and the implementation of modern digital solutions have led to the emergence of the Fourth Industrial Revolution, known as Industry 4.0 (ten Bulte, 2018). This concept encompasses the digitalization and networking of processes through the Internet of Things (IoT), artificial intelligence (AI), big data analytics, and the automation of production and services (Piwowar-Sulej, 2020; Dhanpat et al., 2020).

The changes brought by Industry 4.0 significantly affect business models, organizational structures, and human resource management (ten Bulte, 2018; Dhanpat et al., 2020). The traditional role of the HR department, which was previously predominantly operational and

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administrative — maintaining personnel records, payroll calculation, and organizing training — is being transformed into a strategic business segment (Piwowar-Sulej, 2020).

A key change is the shift of the HR function from operational tasks to strategic ones, where human resource managers become decision-making partners, drivers of innovation, and agents of change within the organization (Dhanpat et al., 2020; ten Bulte, 2018). Technological innovations enable the use of People Analytics tools for monitoring employee performance and making data-driven decisions (ten Bulte, 2018). Automated candidate selection, virtual training platforms, and digital career planning are becoming the standard in modern human resource management (Piwowar-Sulej, 2020).

In addition to the positive effects, the digital transformation of HR also brings challenges: the need for continuous development of digital skills, employees' adaptation to new working conditions, as well as ethical issues related to data processing and protection (Dhanpat et al., 2020).

Considering all the above, the aim of this paper is to analyze how Industry 4.0 is changing the traditional roles of HR managers, which new skills and competencies are becoming essential for their work, and to identify the main challenges for the successful implementation of digital transformation in practice.

2. Literature Review

Industry 4.0 represents a concept that involves the integration of digital technologies into industrial and service processes, creating smart factories that rely on automation, interconnected devices, and real-time data collection (ten Bulte, 2018). Ten Bulte (2018) defines Industry 4.0 as a process that enables continuous information exchange between machines, systems, and people through the Internet of Things (IoT), big data, and artificial intelligence (AI). Similarly, Piwowar-Sulej (2020) points out that the essence of this industrial revolution lies in the concept of cyber-physical systems, where physical objects and digital networks operate within a single ecosystem.

Industry 4.0 introduces radical changes not only in production methods but also in how work is organized and in the relationships between employees and technology. Digitalization and automation enable greater efficiency and flexibility in business operations but also require the redefinition of job roles, competencies, and processes (Dhanpat et al., 2020). Piwowar-Sulej (2020) emphasizes that Industry 4.0 is not just a technical but also a social process, as it transforms organizational culture and work structures.

The implementation of Industry 4.0 technologies directly changes the way key HR functions are carried out, including recruitment, selection, training, career development, and employee evaluation. According to Dhanpat et al. (2020), the digitalization of HR processes means moving from paper-based and manual administration to digital platforms that use automated procedures, databases, and People Analytics tools.

It has been noted that automated recruitment systems enable the screening of large numbers of candidates, thereby improving the speed and accuracy of selection (ten Bulte, 2018). Algorithms and AI tools can analyze resumes, verify references, and propose shortlists of candidates, which frees HR professionals from routine tasks and allows them to focus on strategic activities. Piwowar-Sulej (2020) adds that employee training is increasingly based on digital platforms, online courses, and virtual reality (VR) simulations, which reduce costs and increase the availability of knowledge.

Digital analytics in HR, known as People Analytics, enables the collection and processing of data on employee performance, job satisfaction, turnover, and productivity. According to Dhanpat et al. (2020), this practice supports data-driven decision-making, which is one of the key principles of modern human resource management in the era of Industry 4.0.
Given the automation of operational HR tasks, human resource managers are taking on a new, strategic role. Dhanpat et al. (2020) in their research identify HR professionals as strategic partners, drivers of innovation, and agents of change. Their role includes creating an organizational culture open to digital transformation, planning employee skill development, and leading reskilling processes.

Ten Bulte (2018) emphasizes that HR managers need to develop new competencies that go beyond traditional HR skills. These include digital literacy, understanding data analytics, and the ability to manage cross-department digitalization projects. Piwowar-Sulej (2020) highlights that the HR department's role is shifting from administration to strategic decision-making and active support of the company's business strategy.

Although Industry 4.0 brings numerous benefits for optimizing HR processes, the literature points to a range of challenges. Ten Bulte (2018) underlines the issue of employees' insufficient digital literacy, which hinders the implementation of new technologies. Piwowar-Sulej (2020) sees employee resistance to change and the adoption of digital tools as a serious organizational risk.

Another challenge concerns ethical issues. The collection and processing of large amounts of personal data through People Analytics raises concerns related to privacy, data protection, and potential misuse (Dhanpat et al., 2020). For this reason, HR departments must develop internal protocols and data protection policies that comply with laws and ethical principles.

Based on the literature analysis, it can be concluded that the role of HR managers in the context of Industry 4.0 is increasingly recognized as strategic and transformational. At the same time, most authors agree that digital transformation brings challenges related to employee competencies, resistance to change, and ethical considerations.

However, existing studies mostly focus on the general theoretical framework and examples from developed economies. There is room for further research on how these trends are applied in real organizational settings and what specific strategies HR managers use in

practice to respond to the challenges of Industry 4.0 (ten Bulte, 2018; Dhanpat et al., 2020; Piwowar-Sulej, 2020).

3. Discussion and Recommendations

Industry 4.0 brings profound changes to the way organizations manage human resources. The term Industry 4.0 encompasses IoT, AI, Big Data, and automation through the implementation of cyber-physical systems, enabling smart factories and digitally networked work processes (ten Bulte, 2018; Piwowar Sulej, 2020). These technologies not only impact production but also transform and redefine the role of HR functions within organizations (Picinin et al., 2023).

Digitizing HRM is a necessary response to contemporary market demands. Critical areas include employee education, training, and development in Industry 4.0 environments (Picinin et al., 2023). It has been shown that automated recruitment systems and digital tools for training enable greater speed and accuracy but require new IT solutions in HRM (ten Bulte, 2018). Moreover, Piwowar Sulej (2020) adds that these trends are strongly supported by empirical evidence: HR must redefine job design, work practices, and employee communication.

HR managers have been identified as strategic partners, innovation champions, and change agents, shifting their role from administrative efficiency to strategic support for business transformations (Dhanpat et al., 2020). Ghazy and Fedorova (2021) confirm this trend in the service sector, emphasizing HR's key role in managing employee adaptation to technology (e.g., AI and IoT).

However, the rise of digital analytics also brings serious concerns: algorithmic bias, transparency, data protection, and increased employee surveillance (Picinin et al., 2023). ten Bulte (2018) and Silva et al. (2022) note that organizations are often ill-prepared for the ethical challenges of HR analytics. Employee resilience is a confirmed challenge—according to these authors, only with active HR involvement can digital transformation become sustainable and accepted.

Based on the above discussion, the following recommendations can help organizations successfully integrate Industry 4.0 into HRM:

1. Training HR managers: Implement ongoing professional development programs for HR managers in digital ethics, artificial intelligence, data protection, and People Analytics tools. To ensure effectiveness, these programs should be practically oriented and include modern data processing methods and leadership skills for managing teams in a digital environment (ten Bulte, 2018; Piwowar Sulej, 2020).
2. Implementing People Analytics: Organizations should plan this system starting from basic analytics up to advanced models. Special attention must be paid to developing internal procedures for processing, collecting, and securing employee data to ensure compliance with current data protection legislation (Dhanpat et al., 2020).

3. Developing HR competencies for a digital culture: HR specialists should actively contribute to shaping an organizational culture and climate that encourage teamwork and openness to digital innovations. This includes promoting flexible work environments and enhancing digital literacy across all employee levels (Picinin et al., 2023; Silva et al., 2022).
4. Managing organizational change: Since digital transformation often triggers employee resistance, it is essential to devise clear change-management strategies. HR managers must ensure that every new initiative is accompanied by internal communication, training, and feedback to alleviate employees' fears of job loss and increase their trust (Ghazy & Fedorova, 2021).
5. Establishing an ethical framework and transparency: Adopt clear ethical guidelines that define responsible use of digital tools in HR processes. These guidelines should regulate the use of algorithms in candidate selection and promotion decisions, ensuring maximum transparency toward employees and applicants (ten Bulte, 2018; Silva et al., 2022).
6. Conducting empirical research in the local context: It is recommended to carry out research through interviews, surveys, and case studies among HR professionals operating in Serbia and the region. Such research would help determine the readiness of domestic HR sectors to respond to Industry 4.0 challenges, analyze existing barriers, and develop models for the successful implementation of modern digital practices in the local business environment.

4. Conclusion

Industry 4.0, as the fourth industrial revolution, has brought profound changes to how organizations approach the digitalization and automation of business processes. These changes are not limited to technical or production sectors but significantly affect human resource management as well. The key conclusion of this paper is that the role of HR managers is shifting from a traditionally administrative and operational focus to that of a strategic partner—shaping organizational culture, driving innovation, and leading change.

The implementation of digital tools, automated recruitment systems, People Analytics, and similar technologies enables the optimization of core HR functions, while also introducing new challenges. HR professionals are increasingly expected to develop digital skills, understand data analytics, and manage employee data responsibly, in accordance with ethical standards and privacy regulations.

This paper demonstrates that successful digital transformation of the HR function requires continuous education and investment in skill development, along with clearly defined internal policies that ensure transparency and build employee trust. When responsibly implemented, digital transformation can become a powerful driver of organizational innovation and competitiveness.

To further improve practice, empirical research in the local context is recommended. Such research would help assess organizational readiness for the challenges of Industry 4.0 and identify the specific strategies HR managers apply in real-world settings. This would bridge

the gap between theoretical models and practical application, reinforcing the strategic role of HR in the sustainable development of organizations in the digital era.

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Kako Industrija 4.0 oblikuje ulogu HR menadžera – Pregled savremenih istraživanja

Sara Anđelković

Apstrakt: *Industrija 4.0 predstavlja četvrtu industrijsku revoluciju, zasnovanu na digitalizaciji, automatizaciji, korišćenju veštačke inteligencije, internetu stvari i analitici velikih podataka. Ove tehnologije transformišu poslovne procese i imaju dubok uticaj na upravljanje ljudskim resursima. Cilj ovog rada je da se sistematski analizira uticaj Industrije 4.0 na promenljivu ulogu HR menadžera, da se identifikuju koje nove kompetencije postaju neophodne za HR profesionalce i da se ispita kako ove promene utiču na organizacione strukture. Alati kao što su veštačka inteligencija, analitika ljudi i automatizacija omogućavaju optimizaciju regrutovanja, obuke, evaluacije zaposlenih i planiranja radne snage, dok istovremeno postavljaju izazove vezane za digitalne veštine, upravljanje promenama i pravna i etička razmatranja korišćenja podataka. Posebno je značajan pomak u percepciji zaposlenih — od „praćenja učinka" do „podržane autonomije".*

Ključne reči: *Industrija 4.0, upravljanje ljudskim resursima, HR menadžeri, veštačka inteligencija, automatizacija, digitalne veštine, organizacione promene, etika podataka.*

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The Impact of Global Economic Crises on Serbia

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Abstract: *This paper provides an in-depth analysis of the effects that major global economic crises have had on Serbia, a small and open transitional economy, over the past twenty years. The paper examines four key crises: the 2008 global financial crisis, the COVID-19 pandemic, the war in Ukraine accompanied by an energy crisis, and the recent wave of global inflation. Each of these crises is explored through the lens of their origins, transmission mechanisms, and specific impact on Serbia's macroeconomic indicators—particularly GDP growth, employment, inflation, investment, and public debt.*

The paper also analyzes the Serbian government's policy responses, including monetary and fiscal measures, and evaluates their short-term and long-term effectiveness. Special attention is given to the role of institutions, external dependencies (such as foreign investment and energy imports), and the structural challenges of the Serbian economy.

Findings suggest that although Serbia managed to implement some stabilizing policies, the country's limited institutional capacity, high external exposure, and lack of structural preparedness reduced the overall effectiveness of crisis management. The paper concludes that building economic resilience must become a long-term strategic goal, focusing on diversification, digitalization, social safety nets, and institutional reform in order to mitigate the effects of future global shocks.

Keywords: *Global crisis, Serbia, financial crisis, COVID-19 pandemic, war in Ukraine, inflation, macroeconomic policy, resilience, fiscal response, monetary policy.*

1. Introduction

Over the past two decades, the global economy has faced a series of severe crises that have significantly impacted national economies, especially small and vulnerable ones like Serbia. From the 2008 global financial crisis and the COVID-19 pandemic to the energy

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crisis caused by the war in Ukraine and surging inflation, the world has entered a period of economic instability and uncertainty. In such times of crisis, the importance of

macroeconomic policies and the speed of institutional response become crucial for maintaining stability, employment, and living standards. Serbia faced different challenges in each of these crises — GDP decline, rising unemployment, currency depreciation, reduced investments, and general uncertainty among citizens and businesses. This paper aims to analyze the impact of the most significant global economic crises on the Serbian economy, comparing their characteristics, transmission mechanisms, and consequences. Through the analysis of the 2008 crisis, the COVID-19 pandemic, the war in Ukraine, and the current inflationary crisis, we will show how these global disruptions affected Serbia's economy and how domestic institutions responded. Special focus will be placed on monetary and fiscal policy measures, their effectiveness, and long-term effects on economic stability.

2. Literature Review

The Global Financial Crisis of 2008 and its Impact on Serbia

The global financial crisis that began in 2007 and peaked in 2008 is considered one of the greatest economic disasters of modern times. Triggered by the collapse of the subprime mortgage market in the U.S., it quickly spread to Europe and the rest of the world. Although Serbia was not fully integrated into the global financial system at the time, the effects of the crisis were quickly felt through a decline in exports, withdrawal of foreign investments, and general market uncertainty.

1. Decline in Economic Activity Before the crisis, Serbia had recorded stable economic growth — in 2007, GDP growth was about 5.4%, with significant inflows of foreign direct investment and increased domestic consumption. However, by 2009, there was a sharp reversal: Serbia's GDP fell by -3.1%, the first contraction since the democratic changes of 2000.

   Main contributing factors included:
   - A significant drop in foreign demand, especially from the EU, Serbia's main trading partner.
   - A more than 20% drop in exports, particularly in the automotive, metal, and textile sectors.
   - A 50% decline in FDI compared to the previous year.
   - Decreased bank lending activity and limited access to capital.

2. Unemployment and Living StandardsThe decline in economic activity quickly impacted the labor market. By 2010, the unemployment rate had reached 19.2%, while youth unemployment exceeded 40%. Many businesses had to reduce staff, and wages in the private sector stagnated or declined. Inflation ranged from 6% to 10% during this period, further eroding citizens' purchasing power. Additionally,

the dinar weakened against the euro, raising the cost of imported goods and living expenses.

3. Government Response

   In response to the crisis, the Serbian government adopted an anti-crisis package in 2009. Key interventions included:
   - Increased public spending through subsidies for agriculture and support for domestic industry.
   - Tax relief for employers who retained or hired workers.
   - Negotiations with the International Monetary Fund (IMF) and a $3 billion arrangement to stabilize public finances.

   The National Bank of Serbia (NBS) raised the reference interest rate to prevent stronger dinar depreciation and intervened in the foreign exchange market to stabilize the currency. However, due to limited fiscal space and high public spending, there was little room for more aggressive stimulus measures.

4. Long-Term Consequences The 2008 crisis slowed Serbia's development for several years. Full recovery to pre-crisis growth levels was not achieved until 2016. Public debt rose from about 29% of GDP in 2008 to over 50% in the following years. The economy became more reliant on the public sector, and many small and medium-sized enterprises closed.

The COVID-19 Pandemic and its Impact on Serbia's Economy

The COVID-19 pandemic, which began in late 2019 in China and quickly spread worldwide, had profound consequences for the global economy. Serbia, as a small and open economy, was not spared. In 2020, the pandemic caused an abrupt halt to economic activity, border closures, declines in consumption and investment, and great uncertainty for citizens and businesses.

1. Health Shock Turned Economic Crisis in March 2020, Serbia declared a state of emergency and imposed strict lockdown measures, including curfews, suspension of public transport, and closure of schools, businesses, and restaurants. Although intended to curb virus spread, these measures had immediate and significant economic impacts. According to the Statistical Office of the Republic of Serbia (RZS), GDP fell by -6.5% in Q2 2020 — one of the largest drops in recent years. The total GDP decline for 2020 was -0.9%, less severe than in many regional countries but still a major shock.

2. Labor Market and Consumption Impact while mass layoffs were avoided, unemployment rose from 9% to over 10% by the end of 2020. Sectors like tourism, hospitality, retail, and transport were particularly affected. Over 200,000 workers were either on forced leave or working remotely. Consumer confidence fell, savings

increased, and consumption declined. Both imports and exports dropped, while investments slowed due to global uncertainty.

3. Government's Economic Relief PackageThe state responded with one of the largest economic packages in Serbia's modern history. In April 2020, a €5.1 billion package (about 11% of GDP) was adopted, including:
   - Payment of minimum wages for micro, small, and medium-sized enterprises.
   - Deferred tax and contribution payments.
   - One-time payment of €100 to all adult citizens.
   - Subsidies to preserve jobs.

   These measures helped prevent a deeper downturn but increased the budget deficit and public debt — from around 52% of GDP to over 58% by the end of 2020.

4. Accelerated Recovery in 2021 thanks to early vaccination and gradual easing of restrictions, Serbia achieved strong recovery in 2021 — GDP grew by about 7.4%. However, recovery was uneven: sectors like construction and industry bounced back faster, while tourism and hospitality lagged.

   The pandemic also highlighted structural issues: reliance on imported medical supplies, unequal access to healthcare, and limited digital infrastructure in education and remote work.

The War in Ukraine and Economic Shocks to Serbia

The war in Ukraine, which began in February 2022, was not just a political conflict in Eastern Europe — it triggered serious disruptions in the global economy. Its consequences were felt in Serbia, even though the country was not a direct participant. Due to its geopolitical position, energy import dependence, and trade ties with both the EU and Russia, Serbia came under complex pressure.

1. Energy Prices SurgeOne of the first and most severe shocks to Serbia came through rising energy prices. Europe faced gas shortages due to reduced Russian supply, causing global prices to spike. Serbia, which imports much of its gas from Russia, had to renegotiate contracts and increase import costs. Electricity and heating prices rose, fueling inflation and adding pressure to households and businesses. The government tried to protect citizens through subsidies and price controls, but these measures were fiscally costly.

2. Trade and Supply Disruptions Sanctions between the West and Russia disrupted global trade flows. Although Serbia did not impose sanctions on Russia, many exporters and importers faced transport, payment, and logistics issues. For instance, food and agricultural exports slowed due to international supply chain limitations. At the same time, fertilizer and raw material imports from Russia became more expensive and less accessible, affecting Serbian agriculture.

3. Impact on Investment and Currency Market the crisis increased investor uncertainty. Although some foreign investments continued, new project initiation

   slowed, especially those dependent on regional stability. The dinar came under pressure in early 2022, prompting the NBS to intervene to maintain exchange rate stability. Rising global inflation also led to interest rate hikes, further slowing economic activity.

4. Geopolitical Pressures and Dual Foreign Policy Serbia faced pressure to align its foreign policy with the EU while maintaining traditional ties with Russia. This position created political tensions that also influenced economic policy — particularly in terms of aid, donations, and access to EU funds.

Inflation and its Consequences for the Serbian Economy

Inflation has been one of the most complex challenges Serbia has faced since 2021. Although primarily driven by external factors, the domestic market has experienced significant consequences.

The main causes of inflation in Serbia include rising energy prices, cost-push inflation due to more expensive imported raw materials, and increased post-pandemic consumption. Additionally, developments in the global food market (e.g., export blockades from Ukraine) contributed to the rise in basic food prices. Inflation has reduced real wages and citizens' savings. Vulnerable groups, who spend a larger portion of their income on food and heating, have been particularly affected. For businesses, inflation means more expensive borrowing and higher operating costs. Many companies were forced to raise prices, further burdening consumers. The NBS (the National Bank of Serbia) raised its reference interest rate multiple times during 2022 and 2023 to curb inflation. Although this helped slow inflation in the second half of 2023, higher interest rates also dampened lending activity, potentially negatively affecting economic growth.

3. Conclusion

Global economic crises leave deep marks on all countries, but their effects are especially pronounced in small transitional economies like Serbia. The 2008 crisis revealed Serbia’s vulnerability to external shocks, particularly due to dependence on foreign investment and exports. The COVID-19 pandemic further exposed weaknesses in the health and social systems, as well as in digital and logistics infrastructure. The war in Ukraine and global inflation exacerbated existing problems, placing additional strain on public finances, the labor market, and citizens’ living standards. Serbia responded to each crisis with a combination of fiscal and monetary measures, but institutional capacities were often insufficient for timely and effective action.

One key conclusion is that economic resilience is not built during crises, but in the years preceding them. Investments in education, healthcare, energy efficiency, digitalization, and economic diversification are essential to reduce future risks. Moreover, improving

institutional transparency and accountability is necessary to build public trust. It is also crucial to develop better social protection instruments, especially for the most vulnerable groups who bear the brunt of crises. Serbia must strategically plan its economic future — not just by reacting to external shocks, but through proactive policies that ensure sustainable and inclusive growth.

Ultimately, global crises will continue to occur, but their effects on the Serbian economy can be mitigated if lessons learned are transformed into concrete reforms. The key to the future lies in shifting from reactive crisis management to long-term strengthening of the foundations of economic stability and resilience.

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Uticaj globalnih ekonomskih kriza na Srbiju

Ana Rajević

Apstrakt: *Ovaj rad pruža detaljnu analizu efekata koje su velike globalne ekonomske krize imale na Srbiju, malu i otvorenu tranzicionu ekonomiju, tokom proteklih dvadeset godina. Rad ispituje četiri ključne krize: globalnu finansijsku krizu iz 2008. godine, pandemiju COVID-19, rat u Ukrajini praćen energetskom krizom i nedavni talas globalne inflacije. Svaka od ovih kriza istražuje se kroz prizmu njihovog porekla, mehanizama prenosa i specifičnog uticaja na makroekonomske indikatore Srbije – posebno rast BDP-a, zaposlenost, inflaciju, investicije i javni dug. Rad takođe analizira političke odgovore Vlade Srbije, uključujući monetarne i fiskalne mere, i procenjuje njihovu kratkoročnu i dugoročnu efikasnost. Posebna pažnja je posvećena ulozi institucija, spoljnim*

zavisnostima (kao što su strane investicije i uvoz energije) i strukturnim izazovima srpske ekonomije. Zaključci ukazuju na to da, iako je Srbija uspela da sprovede neke stabilizujuće politike, ograničeni institucionalni kapacitet zemlje, visoka spoljna izloženost i nedostatak strukturne spremnosti smanjili su ukupnu efikasnost upravljanja krizama. U radu se zaključuje da izgradnja ekonomske otpornosti mora postati dugoročni strateški cilj, sa fokusom na diverzifikaciju, digitalizaciju, mreže socijalne sigurnosti i institucionalne reforme kako bi se ublažili efekti budućih globalnih šokova.

Ključne reči: *Globalna kriza, Srbija, finansijska kriza, pandemija COVID-19, rat u Ukrajini, inflacija, makroekonomska politika, otpornost, fiskalni odgovor, monetarna politika.*

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Changes in Education and Human Capital after the Challenges of the COVID-19 Pandemic

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Abstract: *The COVID-19 pandemic has caused significant changes across all segments of society, and the education sector and human capital were no exception. This paper analyzes the transformations that arose as a result of the global health crisis, with a particular focus on the adaptation of educational systems and changes in human capital development. In order to overcome the challenges posed by the pandemic, educational institutions rapidly adopted digital technologies, leading to the widespread implementation of online learning and changes in teaching methodologies. These changes had long-term consequences on the quality of education, access to educational resources, and the ability of the workforce to adapt to new markets and industries. The paper explores how educational systems worldwide responded to these changes, how new forms of learning and employment developed, and how skills and competencies were valued in the post-pandemic society. Additionally, it examines the challenges and opportunities for improving human capital in the era of post-pandemic economic and social transformation. Based on the research, the paper provides recommendations for future educational policy strategies and human capital development in the context of the newly emerged global and local circumstances.*

Keywords: *COVID-19 pandemic, education, risks, human capital, post-COVID.*

1. Introduction

The COVID-19 pandemic, which hit the world in early 2020, had a profound impact on all areas of society, especially on the education sector and the development of human capital. The health crisis led to the overload of healthcare systems, shook global economies, and changed the way of life, work, and education. Given that schools, universities, and other

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educational institutions had to adapt to new circumstances, there was an accelerated shift to digital platforms, creating both new challenges and opportunities. At the same time, the

labor market faced rapid changes that required new skills and competencies, while many industries underwent dramatic transformations in their business models.

Educational systems had to adapt not only to the crisis situation but also to new technological trends, which accelerated the digitalization of teaching and the exploration of new methods of education. Competencies and skills required for the modern labor market were valued differently, and employment paradigms shifted, with a greater emphasis on flexibility and remote work. This paper explores how educational institutions responded to these changes, how students, teachers, and learners adapted, and how all of this affected the development of human capital in the post-pandemic era.

2. Materials and Methods

In modern society, education and human capital are key factors for economic development, competitiveness, and innovation. Therefore, it is important to understand how the pandemic has affected these areas, as it will largely shape the future of education and work. The aim of this paper is to analyze the changes in educational systems and human capital caused by the COVID-19 pandemic, with a particular focus on changes in learning methods, skill assessment, and labor market adaptation.

The hypothesis for this paper is as follows:

- H1: The COVID-19 pandemic has led to significant changes in educational processes and the development of human capital, accelerating the digitalization of education, increasing demand for digital skills, and changing the approach to education on a global scale.

This hypothesis posits that the pandemic has caused a transformation in the way education is delivered and consumed, including the accelerated shift to online learning and a greater focus on digital skills, which has long-term consequences for human capital.

3. Results and Discussion

The COVID-19 Pandemic and the Transition to E-Learning

A pandemic is an event when an infectious disease spreads over large geographic areas, often on a global scale, and affects a large number of people. For a disease to be classified as a pandemic, it usually must spread rapidly beyond the borders of one region, country, or continent and affect people in different parts of the world. Pandemics can be caused by various types of pathogens, such as viruses, bacteria, or other microorganisms, and one of the key factors contributing to a pandemic is the high transmissibility of the disease among humans. For example, COVID-19, caused by a new strain of coronavirus, became a pandemic due to the global spread of the virus and its ability to infect people in nearly all

countries of the world. Pandemics often lead to severe health, economic, social, and political consequences, as they require drastic measures such as quarantines, border closures, movement restrictions, and social distancing to prevent the further spread of the disease.

Viewed in a broader historical context, pandemics have regularly occurred throughout the development of human civilization, and can thus rightfully be considered an inevitable part of it. Depending on the severity of the disease, the duration of the pandemic, the level of civilization development or the specific countries involved, and the strategies implemented to fight the disease and its immediate consequences, pandemics have impacted the shaping of future directions of human society's development (Davis, 2020).

Pandemics, aside from directly threatening health systems, have a huge impact on the global and national economy, political structures, and the social aspects of a large part of society (Huremović, 2019). When the World Health Organization declared COVID-19 a pandemic on March 11, 2020, many initially saw it as a problem limited to China, then Italy, before it rapidly became a global challenge. In a very short period of time, COVID-19 significantly affected all spheres of human life, including the economy, politics, healthcare, society, and other areas (Baldwin, et al. 2019).

Research conducted by the OECD showed that less than 40% of teachers felt prepared to use digital technologies in teaching, with significant differences within the European Union (OECD, 2018). Additionally, the COVID-19 pandemic led to a sudden and rapid shift to online learning and the use of digital technologies (OECD, 2020). In response to the pandemic, European Union member states developed a document outlining the European Commission's vision for high-quality, inclusive, and accessible digital education, with the goal of adapting the education system to the digital age and learning from the crisis caused by the pandemic. Priorities include fostering the development of high-performance digital education systems and enhancing digital skills and competencies necessary for digital transformation. The Commission emphasizes basic digital skills and competencies that should be taught from an early age, including digital literacy, combating disinformation, computer science education, and understanding technologies that use large amounts of data, such as artificial intelligence (EC, 2021).

The lockdown during the COVID-19 pandemic had a significant impact on education systems worldwide, as schools and universities had to close in order to prevent the spread of the virus. This drastic measure resulted in the need for a rapid adaptation of educational institutions to continue classes in a safe manner, without the physical presence of students. As a result, e-learning (online or digital learning) became the primary mode of education. Among the most significant factors explaining how the lockdown during the COVID-19 pandemic laid the foundation for the mass adoption of e-learning are the following:

- **Disruption of Physical Education**: The closure of schools and universities worldwide forced educational institutions to quickly transition to digital platforms in order to continue teaching. Traditional forms of learning (such as classroom lessons) became impossible due to social distancing, prompting many educational

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systems to rely on e-learning. Teachers and students had to adapt to new technologies and methods.

- **Technological Adaptation**: During the lockdown, many schools and educational institutions rapidly adopted digital tools and platforms, such as Zoom, Google Classroom, Microsoft Teams, and other virtual teaching tools. Online learning, video conferences, and online materials became the standard method of teaching. Students and teachers quickly became familiar with new communication and remote learning techniques.
- **Increased Accessibility of Education**: While many educational systems had some form of e-learning before, the pandemic accelerated digitalization. E-learning allowed classes to continue even though students could not physically attend school. This shift to digital platforms provided greater flexibility and access to education, especially in situations where educational content would be unavailable due to emergencies.
- **Need for Adaptable Educational Systems**: The pandemic demonstrated that educational systems must be flexible and able to quickly respond to unexpected situations. Digital education enabled teachers to swiftly adjust curricula, reach students remotely, and use different forms of teaching (video lectures, assignments, online tests) to ensure the continuity of the educational process.
- **Development of Digital Skills**: The pandemic accelerated the development of digital skills for both students and teachers. Many faced challenges using new technologies but simultaneously developed valuable digital competencies that will be crucial for their future careers. E-learning became a bridge that allowed students not only to continue their education but also to develop digital skills essential for the job market.
- **Education Without Borders**: The lockdown highlighted the advantages of e-learning, such as the ability to access educational materials and content anytime and anywhere, without the need for physical presence in the classroom. This approach enables greater accessibility to education, especially for students in rural or remote areas, who might not have had access to quality education without digital tools.

For e-learning to become possible, significant technological development and widespread accessibility were necessary (Stojanović, 2020). In this way, education of all types became independent of physical space and time constraints, thus departing from the confines of traditional teaching, which positively impacts the better connection between the education system and the labor market (Stankić et al., 2020). Without a developed internet infrastructure, this form of teaching would not have been possible. The advantage of e-education lies in the fact that students can independently choose the place, pace, and time of learning, leading to significant time savings. A larger number of students can be educated in the same amount of time, which is difficult to achieve in traditional education due to limited spaces. Careful preparation of courses is required, which are periodically updated or changed, as well as appropriate technical support. This form of education is significantly cheaper than traditional teaching, provides higher quality, saves time, and

allows for the education of a large number of students in a short period of time. Such a result is difficult to achieve in traditional education, which involves a limited number of students and physical space. Additionally, it is not necessary to employ a large number of teachers or rent large spaces; it is enough to create courses that can later be conducted, upgraded, and improved. Once the courses are prepared, only administrative workers are needed. The number of students attending a course has minimal impact on the cost of maintaining the course (Farhan et al., 2018).

Ivanović and Stamenković (2021) emphasize that practice has shown that, although educational institutions lacked developed IT infrastructure and students faced issues regarding computer resources and knowledge of IT systems, e-education and distance learning played a crucial role during the "lockdown" period and later social distancing. A major advantage of this model is its flexibility, which allows students to independently choose the time, place, and pace of their learning.

During the pandemic, the lack of support and structures provided by schools to students further negatively impacted children's health and safety. Schools are not only places for learning but also key pillars for emotional and social well-being. Regular school environments provided students with the necessary structure, safety, and support, while school closures meant that children were left without these important resources. Social distancing measures and isolation, along with the break in contact with peers and teachers, had a serious impact on students' mental health. Many felt lonely, anxious, and insecure due to the lack of social interaction and the instability brought by the pandemic.

Moreover, families faced significant stress due to economic hardships, job loss, and health risks, leading to increased tensions and trauma within families. Research has shown that children who go through crisis situations like this are at higher risk of developing mental health issues, including depression, anxiety, and stress. Additionally, the lack of routine activities and social contacts had a severe impact on children's development, as they were deprived of regular educational and social experiences essential for their growth. This period was especially challenging for vulnerable groups, such as children from socially disadvantaged families or children with developmental disabilities, who needed additional support and resources.

Schools were not just spaces for formal education; they also provided essential emotional support and help in overcoming personal problems. Without this support, students were exposed to a higher risk of developing mental health problems, which could have long-term consequences for their overall development and well-being.

The crisis situation also changed the priority goals of education. The health crisis highlighted the importance of educational programs that prepare young people to work in the healthcare, science, and technology sectors. Countries began to invest more in educational initiatives focused on developing skills necessary for managing crises, such as pandemics. This focus includes strengthening programs in public health and digital

literacy, which have become essential for the future development of society and the ability to deal with similar crises.

Education after the COVID-19 pandemic is not the same as before it. Although the basic functions of education remain similar, the way education is provided, how learning is accessed, and how results are evaluated have significantly changed. Digitalization,

flexibility, new approaches to assessment, and a focus on the social and emotional dimensions of education will likely become a permanent part of educational systems. The pandemic provided an opportunity for the transformation of education systems, but it also highlighted challenges related to inequality, access to technology, and the need for greater support for mental health. The future of education will likely be more hybrid, with an increased emphasis on digital tools and resources, but there will still be a need to balance technology and personal experiences in the classroom.

The Impact of the COVID-19 Pandemic on Human Capital through the Lens of the Post-COVID Era

Human capital is a term used to refer to all the skills, knowledge, experience, abilities, and attributes that people possess and that can contribute to economic development and productivity. This includes education, training, work capacity, creativity, social skills, and health.

Human capital is often seen as a key factor for the development of businesses, industries, and economies as a whole, as educated and skilled workers can enhance efficiency and innovation. Investment in human capital, through education and training, is considered the foundation for long-term economic growth and competitiveness. The literature recognizes the term “entrepreneurial human capital,” which refers to the knowledge and skills (competencies) possessed by entrepreneurs (Skuras et al., 2005; Radosavljević, Josipović, Kokeza & Urošević, 2022). Additionally, knowledge, creativity, talent, and innovation are more closely linked to the local economy, which is characterized by a high presence of entrepreneurial activities. Conversely, entrepreneurial activities contribute to improving regional economic performance when their promoters are highly educated, creative, and talented individuals (Molinar, Josipović & Baškot, 2024).

The specificity of human capital, inherent to its bearer, lies in the fact that it is part of a person's personality and cannot be transferred or taken away like other types of capital, such as money or physical assets. In this way, human capital remains with the individual, even if they lose all their property or wealth. This can be seen in examples such as war refugees, Jewish survivors after the Holocaust, or the Japanese and Germans who, after World War II, despite nearly complete loss of everything, relatively quickly rebuilt successful economies and nations. Human capital, such as skills, knowledge, education, diligence, and perseverance, provides answers to questions about economic success and failure, about "economic miracles" on one side, and stagnation and collapse on the other. According to Bralić, Katić, and Stanarević (2015), "The peculiarity of human capital is

reflected, among other things, in the seemingly paradoxical nature of knowledge and education as a specific type of good; knowledge as a commodity differs from the traditional concept of goods in that it has a 'non-rivalrous' nature (non-rival commodity), and it does not 'depreciate' with use, but rather spreads."

Today, human capital consists of intangible collective resources possessed by individuals and groups within a certain population. It thus implies not only knowledge and skills, but also experience, creativity, individuality, good health, and moral character. In a business-

organizational sense, it is understood that joint investment by employers and employees in human capital contributes to long-term development not only of the company but also of society as a whole, and greatly supports sustainable development both in the country in which it is applied and on the planet Earth. Human capital is one of the main factors for development, and its strengthening is a key priority for all countries. However, it seems that this is not the case in the Republic of Serbia, as the World Economic Forum places Serbia highly when it comes to "brain drain."

Additionally, human capital, especially in its early stages of an individual's formation, can be observed through the number of enrolled students in the first year of higher education institutions. According to relevant data from the Republic Statistical Office, the number of first-year enrollees in higher education institutions in Serbia has been declining over the past three academic years. The total number of enrollees in the 2022/23 academic year was 49,387, in 2023/24 it was 47,946, and in the current year it stands at 47,588. Table 1 presents the structure of enrolled students.

Table 1. Number of Enrolled Students

	2024/25	**2023/24**	**2022/23**
State Faculties	26.335	26.957	28.372
Private Faculties	9.836	8.963	9.055
Academies of Applied Studies	8.945	9.630	9.717
High school of applied studies	2.427	2.369	2.243
Total	**47.588**	**47.946**	**49.387**

Source: Author based on RZS data

At the time the Covid-19 pandemic broke out, one of the biggest challenges for educational institutions was the transition to distance learning. The knowledge and skills of employees at that moment in this field were of crucial importance. The knowledge and skills of staff at educational institutions at the outbreak of the COVID-19 pandemic represented a key factor in adapting to new circumstances. In many countries, access to education became unequal due to different technological resources, and many students did not have the necessary conditions for effective remote work. Additionally, teachers had to quickly

develop digital skills, which affected the quality of education and professional training. Many educators faced the challenge of switching to online teaching, which required the rapid adoption of new technologies, digital tools, and learning platforms. It was also necessary to develop the ability to manage new forms of communication and interaction with students remotely, while simultaneously dealing with the stress and uncertainties brought on by the pandemic.

Some employees already had certain digital skills and experience with technology, while others had to quickly master new tools. This period also highlighted the importance of flexibility, creativity, and the ability to adapt quickly, as educational institutions had to implement new approaches to teaching, assessment, and student support. It became clear that the knowledge and skills of the teaching staff were crucial for the continuity of education in times of crisis. In a study conducted by Bučić and Nikolić (2022), one of the questions in the questionnaire related to training employees for working with new platforms for online teaching. The results showed that 33 (55.9%) of respondents had an adequate training program for using these platforms, while 26 (44.1%) reported that they had not received any training. These results indicate that a number of employees lacked the necessary knowledge and skills to work with new technologies, which affected the quality of their work and the extent to which they were exposed to stressful situations.

Given what we know today, it is necessary to analyze the impact of the COVID-19 pandemic on human, physical, and social capital. If we consider this over a longer period, the analysis will certainly become one of the important tools that will provide relevant answers. When comparing this to the HIV/AIDS pandemic, considering it as a model regarding negative effects on human capital and other macroeconomic parameters, as well as the potential effects of the Covid-19 pandemic, it is clear that, unlike Covid-19, HIV/AIDS primarily affects the economically productive population, and in some countries, it can lead to a dramatic decrease in the working-age population due to widespread infection. The impact of such a disease on human capital led some authors early in the COVID-19 pandemic to question whether the significant economic costs and losses caused by measures to combat the pandemic were justified by extending the lives of only a few years of the oldest and economically non-productive population (Cvetković & Miljković, 2020).

In the case of a rapid spread of infection among the working population, in addition to the obvious losses in terms of a reduced workforce, treatment costs, and reduced working hours, and in the worst cases, loss of life, there could be long-term effects in the form of a significant number of people with chronic health problems. COVID-19 directly affected the health of individuals, both physically (virus infection) and mentally (stress, anxiety, depression). Many people faced serious health problems or the loss of life, reducing the available workforce. Additionally, the prolonged effects of the disease, such as post-COVID syndrome, left long-term consequences on productivity and individuals' ability to work. These issues could negatively affect the future economic development of the

country, in a similar manner to how the HIV/AIDS pandemic impacted Sub-Saharan Africa, although likely to a lesser extent. Many sectors, particularly those reliant on physical labor (services, manufacturing), suffered a large decline in activity due to business closures and quarantine measures. This resulted in mass job losses and a reduction in the workforce capacity of certain worker groups. On the other hand, some sectors, such as the IT industry, experienced rapid growth. While it is currently impossible to precisely estimate all of the consequences because this requires a multidisciplinary approach, it is important that future national economic development strategies take these potential challenges into account.

The COVID-19 pandemic had a serious impact on human and social capital, reducing workforce efficiency and causing social and economic inequalities. However, it also highlighted the importance of flexibility, collaboration, and innovation. In the long term, recovery will depend on society's ability to build resilience, invest in human capital through

education and health, and restore mutual trust and social solidarity. One of the greatest challenges in the post-COVID world will be reducing inequalities in access to education and the labor market. The pandemic exacerbated existing inequalities, as the most vulnerable segments of society, such as those with lower incomes, limited access to technology, and educational resources, were the hardest hit. In the post-COVID society, it is important to focus attention on reducing these inequalities to enable all individuals to develop their human capital and become competitive in the labor market. Increasing access to quality education, digital tools, and training opportunities will be crucial for providing more equal opportunities for everyone. Additionally, enhancing access to mental health support, as well as promoting social integration, can help reduce social inequalities and strengthen social capital.

4. Conclusion

The COVID-19 pandemic had a profound impact on the education system, as well as on the development of human capital worldwide. The crisis triggered by the global health situation accelerated the process of education digitalization, resulting in a transformation of educational methods and approaches to teaching. At the same time, the challenges faced by educational systems and the workforce during the pandemic led to significant changes regarding the developments and needs of human capital, which will have long-term consequences for economic and social development.

One of the key consequences of the pandemic was the accelerated adaptation of educational institutions to digital technologies. The transition from traditional classroom teaching to online learning was not only a technical challenge but also raised questions about the balance in access to educational resources. In many countries, students faced inequalities in access to the internet, electronic devices, and quality educational content. This led to an increase in digital literacy among a large number of students and teaching staff, but it also

deepened the digital divide in society, which represents one of the key challenges in the process of rebuilding the post-pandemic education system.

Since many workers had to adapt to new ways of working, such as remote work, it became evident that the development of digital skills had become crucial for maintaining competitiveness in the labor market. In many industries and sectors, the demand for skills in technology, communication, and data management increased significantly. This created a new dynamic in the educational process, as educational institutions had to include new curricula and training programs to enable students and employees to acquire relevant skills for the labor market.

Additionally, the pandemic highlighted the importance of social and emotional skills, both in education and in the business world. Stress, anxiety, and mental health problems caused by the global crisis underscored the need for a greater focus on mental health and emotional intelligence in educational programs. Education on health, emotional resilience, and social responsibility became critical in preparing new generations for the challenges posed by a rapidly evolving information society.

The pandemic also highlighted a serious challenge related to the balance between the education system and labor market needs. While many industries required new technologies and highly skilled workers, on the other hand, the economic uncertainty created by the pandemic led to changes in educational trends. Educational systems had to adapt to the faster changes in the labor market, which created the need for the development of more flexible and dynamic educational policies.

In the context of human capital, the COVID-19 pandemic highlighted the crucial role of education in preparing the workforce for crisis situations. Efficient education, which allowed for a rapid adaptation to new circumstances, became the foundation for the recovery and growth of the post-pandemic society. Given that human capital forms the basis for economic development, the accelerated development of digital skills, increased investment in education and training, as well as the preservation of workforce health, will be key factors for long-term economic recovery and sustainability.

Although many challenges emerged during the pandemic, such as disruptions in educational processes, a decline in the quality of education in some parts of the world, and social inequality, there are also positive aspects that may be beneficial for the future. For example, the digitalization of education enabled wider access to educational resources, creating new opportunities for learning and development, while simultaneously fostering global collaboration among educational institutions and organizations.

Finally, the challenges of the COVID-19 pandemic allowed for a reassessment of educational systems and human capital, laying the foundation for a new way of education, based on technology, flexibility, and social responsibility. This period of accelerated digitalization and adaptation demonstrated that educational systems must be prepared to transform quickly to respond to global challenges such as pandemics, climate change, and

technological progress. This process is key to creating resilient and competitive human capital, which will be crucial for recovery and growth in the post-pandemic world.

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Promene u obrazovanju i ljudskom kapitalu nakon izazova pandemije COVID-19

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Apstrakt: *Pandemija COVID-19 izazvala je značajne promene u svim segmentima društva, a sektor obrazovanja i ljudskog kapitala nije bio izuzetak. Ovaj rad analizira transformacije koje su nastale kao posledica globalne zdravstvene krize, sa posebnim fokusom na prilagođavanje obrazovnih sistema i promene u razvoju ljudskog kapitala. U cilju prevazilaženja izazova koje je pandemija postavila, obrazovne institucije su ubrzano usvojile digitalne tehnologije, što je dovelo do masovne primene online nastave i promena u metodologijama učenja. Ove promene su imale dugoročne posledice na kvalitet obrazovanja, pristup obrazovnim resursima, kao i na sposobnost radne snage da se prilagodi novim tržištima i industrijama. Rad istražuje kako su obrazovni sistemi reagovali na ove promene, kako su se razvijali novi oblici učenja i zapošljavanja, kao i kako su se vrednovali veštine i kompetencije u postpandemijskom društvu. Takođe, analiziraju se izazovi i mogućnosti za unapređenje ljudskog kapitala u eri postpandemijske ekonomske i društvene transformacije. Na osnovu istraživanja, rad pruža preporuke za buduće strategije obrazovnih politika i razvoja ljudskog kapitala u kontekstu novonastalih globalnih i lokalnih okolnosti.*

Ključne reči: *Pandemija Covid-19, obrazovanje, rizici, ljudski kapital, postcovid.*

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- Discussion
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- Conclusion

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