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CONTENT

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DEVELOPMENT OF COOPERATIVES THROUGH THE ENTREPRENEURIAL ECOSYSTEM APPROACH

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Abstract: Cooperatives have become a key player in the social economy, contributing essentially to the improvement of population well-being and the development of communities and localities. They have demonstrated resilience in times of crisis and have shown that they can cope with contemporary societal challenges. Due to this, European institutions and international organizations advocate for the advancement of cooperatives as an effective business model and suggest that governments provide assistance to cooperatives and other social economy enterprises in achieving their socioeconomic objectives and executing development policies. Despite their increasing evolution, cooperatives have yet to fully realize their potential for economic growth and social inclusion. One of the main causes is the lack of a systemic approach to the problems faced by cooperatives, the internal and external factors that influence their activities, and their development prospects. In this regard, the application of an innovative approach in designing development strategies for cooperatives and their activities - the concept of the entrepreneurial ecosystem for cooperatives - will facilitate the transition towards a growth-oriented policy by leveraging the potential and contribution of all elements of the cooperative ecosystem.

The aim of this research is to assess the importance and role of cooperatives in contemporary society, to conceptualize the cooperatives ecosystem, and to use this approach in the strategic planning process for the development of the consumer cooperatives sector in the Republic of Moldova.

The research employed a diverse array of methodological tools, encompassing multiple approaches, methods, and techniques such as bibliographic documentation, analysis and synthesis methods, statistical and econometric methods, questionnaires, interviews, benchmarking, and others.

The application of the ecosystem approach in designing the development strategy for consumer cooperatives in Moldova until 2030 enabled the creation of a development policy focused on economic growth and well-being, based on innovation and the collaborative efforts of all stakeholders.

Keywords: cooperatives, entrepreneurial ecosystem, development strategies.
JEL Classification: M2, O21, L26

1. Introduction

Cooperatives constitute a significant segment of the national economy in numerous countries because of their economic and social impact. Consequently, they have emerged as one of the most widespread forms of economic activity that embody social values.

Recognizing the importance of cooperatives, the United Nations proclaimed 2012 the International Year of Cooperatives under the slogan "Cooperative enterprises build a better world". This initiative significantly enhanced the visibility, recognition, and development of cooperatives.

Appreciating the role and contribution of cooperatives to the development of humanity and society, the UN General Assembly on June 20, 2024, declared 2025 as the International Year of Cooperatives, which will run under the same slogan. It is also worth mentioning that in 2016, UNESCO recognized cooperatives as an intangible cultural heritage of humanity due to the values they promote.

In the UN Secretary-General's report "Cooperatives in Social Development" (UN, 2023a), it is acknowledged that despite member states recognizing cooperatives as key partners in sustainable development "they continue to play a relatively small part in overall economic and social policies and practice, compared with their huge potential contribution."

The dynamization of cooperative development and the enhancement of their contribution to socio-economic evolution require new innovative approaches to the organization, functioning, and design of policies in this area. Although actions taken in recent years in this field have had a positive impact on the evolution of cooperatives, their potential and contribution to solving societal issues remain underutilized. One of the reasons, as experts assess, is the sequential, non-systemic approach (focused on policies, or on improving the legislative framework, or on financial support tools, etc.) to the development prospects of cooperatives at all levels (national, regional, sectoral), with the emphasis placed only on certain components that influence the functioning of the cooperative system. Existing approaches, focused on specific segments of the cooperative system or certain actions, such as stimulating the growth of the number of cooperative enterprises, developing framework conditions and forms of support, and creating favorable environments for starting businesses, have proven to be of limited effectiveness.

In this context, a new paradigm for cooperative development is necessary, one that embraces a systemic and innovative approach. One solution is the adoption of the ecosystem concept for cooperatives, which emphasizes collaboration among all stakeholders and fosters a shift in attitudes towards cooperatives.

From this perspective, the UN recommends that member states adopt the entrepreneurial ecosystem approach (UN, 2023b) to support cooperatives in their efforts to foster sustainable development and enhance economic and social well-being.

The concept of the entrepreneurial ecosystem is relatively new in recent research and is still in development. Currently, there is no unified vision or approach regarding the model of such an ecosystem, particularly in the case of conceptualizing a cooperative ecosystem.

For the cooperative sector, which combines economic activity with social responsibility - representing a specific form of business and being considered key actors in the social economy - a systemic approach to the sector's future prospects becomes imperative.

However, when defining the concept of a cooperative ecosystem, it is essential to consider that cooperatives are part of the social economy, which differs from the traditional economy through the duality of its activities (economic and social). This duality influences the components that constitute the ecosystem and the relationships between them.

Understanding and designing a cooperative ecosystem is particularly important for the development of policy documents that ensure sustainable economic growth, social inclusion, community development, environmental protection, and responsible consumption and production.

2. Cooperatives development through the ecosystem approach

2.1. Cooperatives in a global economy: importance, scale, development strategies

Cooperatives represent a distinct dimension in economic and social activities at the international, national, and regional levels. According to the International Co-operative Alliance (ICA), cooperatives are defined as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise" (International Co-operative Alliance, n.d.). Cooperatives are characterized by a dual model based on both economic and social components, which are closely interconnected and mutually reinforce each other, thus contributing to the added value of the activities and services offered by cooperatives. They differ from other forms of economic organization. Recognized as key actors in the social economy, occupational policies, and inclusion, cooperatives can actively engage and make significant contributions to sustainable economic and social development due to their distinctive features: the foundation of their activities on principles, values, and ethics; the harmonious combination of economic and social activities for the benefit of their members and communities; their omnipresence across geographic dimensions (local, regional, international, global); the diversity of economic activities (production, agriculture, trade, banking, insurance, pharmaceuticals, forestry, renewable energy, etc.) and social activities (education, employability, community care); and the variety of cooperative types.

Given the role cooperatives play in society and the benefits they offer to members, employees, and the community, they have experienced consistent growth worldwide, involving an increasing number of members and stakeholders, including authorities responsible for developing growth policies.

According to data from the International Co-operative Alliance, cooperatives represent about one billion members globally, and approximately 280 million employees are engaged in cooperative activities. They account for 10% of all jobs worldwide (International Co-operative Alliance, n.d.).

The significance of cooperatives is also increasing within the European Union. Approximately 250,000 cooperative enterprises operate in the EU, owned by 163 million members. European cooperatives provide jobs for 5.4 million people and contribute, on average, about 5% to the GDP of each member state (Cooperatives Europe, n.d.).

An important sector of the cooperative movement is that of consumer cooperatives. The European Community of Consumer Cooperatives (EuroCoop) brings together 30 million

consumer members (or 21.3% of the total membership in Europe), employs 750,000 people (14.9%), and operates through 94,000 sales points (EuroCoop, n.d.).

Globally, the cooperative system integrates approximately 12% of humanity. The annual turnover of cooperative businesses reaches 2.6 trillion US dollars, ranking the cooperative business at the respectful 10th place among the top developed economies in the world. (Central Cooperative Union - Bulgaria, n.d.).

These figures demonstrate the scale and importance of cooperatives and the organizations representing them in the global and European economic and social systems. The importance of cooperatives is recognized and supported globally. In numerous international documents, such as UN resolutions (UN, 2023a, 2023b; UN, 2023, etc.), European Parliament resolutions, European Commission Communications (European Parliament, 2013; European Commission, 2021), and recommendations from international organizations (International Labour Organization, 2002; 2019), the role and impact of cooperatives on societal development are highlighted. Cooperatives are noted to be more resilient to economic crises compared to traditional businesses and can respond more effectively to challenges. In this context, governments are encouraged to support cooperatives by improving the legislative and regulatory framework to create a favourable environment for their development. Additionally, they should implement policies and programs that leverage the cooperative business model, promote the exchange of best practices to raise public awareness of cooperatives, and enhance the capacity to collect comprehensive and comparable international data on the role of cooperatives in economic and social development, as well as their contribution to the Sustainable Development Goals.

However, the level of cooperative sector development varies across different regions and countries. This depends on the context in which cooperatives operate, the challenges they face, the policies promoted, the degree of support from authorities, the cooperative culture, and the public's awareness of the importance of this business model, among other factors.

To support and stimulate cooperative development globally, the International Cooperative Alliance General Assembly adopted the strategic plan "A People-Centered Path for a Second Cooperative Decade 2020-2030" (approved in 2020), which represents a worldwide strategic plan for the cooperative movement. This plan sets an ambitious goal - a cooperative business model to become: the acknowledged leader in economic, social, and environmental sustainability; the model preferred by people; the fastest-growing form of enterprise. Achieving this goal requires the development of national policies that address both global and local challenges while driving the innovative, inclusive, and sustainable development of cooperatives.

The consumer cooperatives system in the Republic of Moldova is proud to be part of the international cooperative community, having joined the International Cooperative Alliance in September 1993. Through this membership, Moldova has committed to adhering to international cooperative principles and sharing cooperative values.

2.2. The context and challenges of the Moldovan consumer cooperatives development

In the Republic of Moldova, cooperatives have historically played a significant role in the country's economic system, particularly up until the 1990s. However, with the transition to a

market economy characterized by competition, cooperatives experienced a decline in their market position due to both external and internal factors, such as managerial inefficiencies and challenges in adapting to the new economic environment. Although subsequent efforts were made to revitalize the cooperative sector, they have not achieved the previous levels of market share or influence. Over time, the legal framework surrounding cooperatives has evolved, leading to the emergence of new cooperative forms, including entrepreneurial cooperatives. Despite these developments, consumer cooperatives remain the most widely recognized and prevalent form.

Throughout its more than 155-year history, consumer cooperation in Moldova has experienced various phases of growth and decline but has managed to remain part of the country's economic system. Currently, the consumer cooperative system has approximately 56,000 members, 118 economic entities, including 74 consumer cooperatives, 1,344 retail units, 144 public catering units, and 21 markets. Cooperative entities provide a wide range of services, including retail and wholesale trade, the acquisition of agricultural and animal products, their processing, and the provision of various services such as education, market, and public catering services. They primarily serve members and the communities within their area of operation, encompassing about 57% of the country's population. Over the last decade, the cooperative system has experienced stable development with slight growth.

Nevertheless, cooperatives face numerous endogenous and exogenous challenges. The COVID-19 pandemic, the ongoing regional conflict, and the energy crisis have had a significant impact on the activities of cooperative organizations and enterprises, leading to adverse effects on their economic and financial performance. Cooperative entities primarily operate in rural areas, serving small or remote communities that are often disregarded by traditional businesses due to low profitability. Despite these challenges, consumer cooperatives remain committed to fulfilling their mission of providing goods and services to their members in these regions. However, their efforts are frequently hindered by insufficient support from local public authorities and a lack of effective collaboration.

The analysis of the operating context of consumer cooperatives has highlighted also other constraints faced by this system, including:

- imperfections in the legislative and regulatory framework governing consumer cooperatives and its alignment with other normative acts;
- unfair competitive environment for all economic actors operating in the domestic market;
- decreased income levels and purchasing power of the population served;
- regressive demographic trends, population migration, including the migration of economically active labour, and decreasing demand at both local and national levels;
- declining market positions in key economic activity sectors;
- low profitability in some economic activities, primarily due to the social nature of cooperative services;
- insufficient financial resources for implementing large-scale programs for infrastructure modernization, upgrading technology, and expanding operations;
- reduced engagement of cooperative members in supporting and developing cooperatives due to a lack of effective economic and social motivation mechanisms;

- underestimation by public authorities of the role that the consumer cooperative system plays in implementing state social policies and a lack of support for cooperative activities with social relevance in economically unprofitable localities;
- weak cooperation between cooperatives and with other types of cooperatives;
- resistance to structural and managerial optimization within the cooperative system, along with insufficient promotion of territorial (geographical) and economic integration processes;
- a slow pace of innovation in cooperative processes;
- lack of attractiveness for internal and external investments in the cooperative system;
- limited interest from young people in joining consumer cooperatives, among others.

Global challenges and internal needs for change necessitate a rethinking of the operational and management structures of the consumer cooperative system in the country, including its various sectors and forms of activity, as well as its relationships with members and stakeholders. Furthermore, there is a need to develop the legislative framework and align it with EU acquis, redefine the role of the state in relation to consumer cooperatives, and reconstruct the image of cooperatives within society. All these factors call for new development policies for cooperatives based on systemic and complex approaches in order to respond promptly to current and future challenges in a constantly changing world. In this regard, we believe that the development of a cooperative ecosystem that considers the duality of cooperatives (both an economic and a social component) and it is based on the integration of entrepreneurial ecosystem and social enterprise ecosystems approaches would provide an innovative vision for the development of consumer cooperatives and a fundamental premise for designing evolutionary strategies in this domain.

2.3. Applying the ecosystem approach for the development of cooperatives

The entrepreneurial ecosystem approach presents a key way to support cooperatives in realizing their full growth potential, enhancing their capacity to support sustainable development and improve economic and social well-being, as mentioned in the UN Secretary-General's Report "Cooperatives in Social Development" (UN, 2023a).

According to research, the entrepreneurial ecosystem is defined as „a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment" (Mason & Brown, 2014).

The implementation of the entrepreneurial ecosystem facilitates the transition from classical entrepreneurial policy to a growth-oriented policy. Moreover, the development of entrepreneurial ecosystem strategies constitutes a new paradigm of economic development.

Currently, several models of the entrepreneurial ecosystem are known, reflected in various research, policies, and declarations from international organizations. However, most converge toward the model proposed by Daniel Isenberg (Isenberg, 2011), which has become the most

commonly used. Referring to the general concept of the entrepreneurial ecosystem, Isenberg identifies six general domains within the entrepreneurial ecosystem: (1) a favorable culture, (2) supportive policies and leadership, (3) availability of adequate financing, (4) quality human capital, (5) friendly risk markets for products, and (6) a range of institutional supports. All these domains include a multitude of elements that interact with each other in various ways. Implementing such a system means a shift from specific enterprise interventions to more holistic activities focused on building new institutional capacities, converging priorities, developing networks, and promoting synergies among various stakeholders.

In the report "Cooperatives in Social Development" (UN, 2023a) are identified and characterized five key elements of an entrepreneurial ecosystem that could be relevant for fostering a cooperative ecosystem: legislation, policies and institutions of support to cooperatives; education and capacity-building; cooperative culture; funding and finance; networks and partnerships. However, these elements are primarily examined through the lens of supportive policies provided by authorities.

We believe that the dual nature of cooperative activities (economic and social) have to be taken into account when conceptualizing a cooperative ecosystem. This leaves its mark on the components that constitute the entrepreneurial ecosystem for cooperatives and the relationships between them. In this sense, we consider it appropriate to use both concepts – entrepreneurial ecosystem and ecosystem for social enterprises – in the conceptualization of the cooperative ecosystem.

The term ecosystem has recently penetrated the field of social economy. A vision of the ecosystem for social enterprises is presented in the European Commission's report "A map of social enterprises and their eco-systems in Europe" (European Commission, 2015). This report introduced the concept of an ecosystem for social enterprises, focusing on six characteristics considered important for the support policy framework in this field: legal framework; social investment market; impact measurement and reporting system; networks and mutual support mechanisms; specialist business development; certification systems, marks and labels. The report includes a mapping of social economy enterprises at the European level and serves as an important study for designing European policies for the development of social entrepreneurship.

In another study, "Social enterprises and their ecosystems in Europe. Comparative synthesis report" (European Commission, 2020), four pillars are highlighted on which the social enterprise ecosystem should be based: citizens' ability to self-organise; the degree of visibility and recognition enjoyed by social enterprises at different levels; the capacity to access different kinds of resources**;** research, education and skills development. The ecosystem of social entrepreneurship is specific due to the hybrid nature of social enterprises, which is also characteristic for cooperatives, the most relevant actors in the social economy.

Therefore, we consider that for the field of cooperatives, the optimal solution would be to combine both concepts: entrepreneurial ecosystem and ecosystem for social enterprises, and to develop a model of an ecosystem adapted to the specific characteristics of cooperatives. Based on the research conducted, such a model has been developed, which includes all relevant actors (cooperatives, stakeholders, partners) and the relationships between them, as well as the development of networks. Moreover, it reflects the internal factors that influence the potential

and evolution of cooperatives, the external environmental factors impacting the cooperative system, and the connections with other ecosystems. Understanding and modelling the cooperative ecosystem is important for designing development policies for cooperatives.
The establishment and development of a cooperative ecosystem, oriented towards economic growth and social well-being, requires joint and synergistic efforts from all actors within the cooperative ecosystem, the establishment of a relational system that supports partnership, innovation, the development of new businesses, stimulates investment, and the efficient use of resources, as well as the development of human capital.
The cooperative ecosystem offers numerous benefits to members, businesses, and society by creating jobs, encouraging innovation and competitiveness, attracting investments, facilitating the exchange of knowledge and experience, and generating positive societal effects over the long term.

2.4. Designing the development policy of consumer cooperatives development based on the cooperative ecosystem approach

The approach and model of the ecosystem for cooperatives mentioned above have been used for designing the Strategy for the Development of Consumer Cooperatives in the Republic of Moldova for the period 2025-2030.
This strategy was developed using a comprehensive methodology that included the evaluation of relevant national development policy documents, an analysis of the current state and evolutionary trends within the cooperative system, of the international strategies related to cooperatives, and national and sectoral development priorities aligned with our country's European integration efforts. Additionally, public consultations with stakeholders were conducted. As a result, four strategic priorities for the development of the consumer cooperative sector were identified. For each of these priorities, specific strategic objectives and actions aimed at realizing the vision and mission of the Strategy were outlined, along with the expected outcomes (Table 1).

Table 1 Strategic priorities for the development of consumer cooperatives in the Republic of Moldova and expected outcomes

Nr.	Strategic priorities	Expected outcomes
1.	Creating a favourable environment for the development of consumer cooperatives.	Recognition and promotion of the identity of cooperatives; enhancement of the regulatory framework and its alignment with European legislation, including amendments to Consumer Cooperative Law 1252/2000; transfer of international best practices, including European ones, to the national cooperative sector; increased interest in cooperatives and a growing number of cooperative members; establishment of regional cooperatives; enhancement of the visibility of cooperative brands; digitization of business and communication processes; creation of integrated cooperative structures (trade, procurement); optimization of the management system; development of a motivating system for

		attracting domestic and foreign investments; establishment of an internal audit service; utilization of European funds for cooperatives; robust human resources; and increase the number of young people engaged in cooperatives.
2.	Integration, development, and infrastructural modernization; technological innovation.	The establishment of regional-sectoral structures; modernization of cooperative infrastructure in line with modern technologies; accessing development funds for cooperatives from external sources, including European sources; establishment of an effective member motivation system for investments in the development of cooperatives; increasing economic efficiency; growth of innovative and competitive cooperative products and services; implementation of the circular business models and optimization of resource consumption; increasing investments in green and digital technologies, digitization of business processes; contribution to achieving the SDG – responsible consumption and production through the implementation of sustainable practices; establishment of an integrated cooperative information system; creation of microfinance structures.
3.	Diversification of activities, promotion of efficient services to members and other categories of beneficiaries, bringing them closer to consumers.	Products and services offered by consumer cooperatives that are diverse and of high quality; the development of subsectors related to traditional activities (service provision, maintenance, repairs, etc.); increasing the number of members involved in cooperative business activities; responsible participation of members in the governance of cooperatives; the establishment of an efficient system for informing members and communicating with them, including collecting feedback for the continuous improvement of consumer cooperative services; improving property relations; a strengthened, visible, and attractive brand for cooperative products/services; and the implementation of consumer loyalty programs.
4.	Multidimensional cooperation.	Strengthening collaboration within the consumer cooperative ecosystem; establishing an efficient cooperation system among consumer cooperative entities throughout the country, resulting in the sharing and rational use of resources, the establishment of common structures for business organization, and the optimization of business management; alliances created with partners from non-cooperative sectors; establishment of regional cooperative hubs; development of business partnerships with cooperative organizations abroad; a strengthened system of effective collaboration with central and local public authorities, including financial and fiscal support actions for cooperative activities in areas of socioeconomic interest of the state;

		cooperation with cooperatives from other sectors; new partnerships and collaboration with development partners, support organizations, and financing bodies for entrepreneurial activities, and professional organizations.

Source: elaborated by the authors.

These priorities with the associated strategic objectives and actions were incorporated in the Strategy for the Development of Consumer Cooperatives in the Republic of Moldova for the period 2025-2030. It is estimated that as a result of the actions undertaken, retail sales will increase annually by 3-5%, wholesale sales by 5-7%, product procurement by 5-10%, goods production by 3-4%, services provision by 7-12%, revenues will increase by 3-5%, and net profit will rise by 7-10%.

The implementation of the Strategy will have economic, social, and environmental impacts. Its realization will contribute to solving societal issues such as poverty reduction and increased well-being, employability, improving the quality of life for members and other beneficiaries, and developing communities.

3. Conclusion

As part of the social economy, cooperatives play an important role in contemporary society by contributing to employment, fostering community and locality development, meeting the diverse needs of their members and the population within their area of activity, and supporting the achievement of sustainable development goals, among others.

The cooperative sector is continuously growing and expanding. However, its potential is not fully utilized. Strategies for economic growth and social inclusion are necessary to place cooperatives on a new trajectory of evolution. The cooperative ecosystem approach offers a new and distinctive perspective for designing development policies for this sector.

This paper emphasizes the role and dimension of cooperatives in the contemporary socioeconomic system, argues for the opportunity to apply the ecosystem approach to the development of cooperative policies, analyses concepts related to the entrepreneurial ecosystem and the ecosystem for social enterprises, and argues the necessity of a distinct approach for cooperatives considering their dual nature (an economic component and a social one). Based on the research conducted, a cooperative ecosystem has been conceptualized, and a model for such an ecosystem has been developed.

Using the concept and model of the cooperative ecosystem proposed by the authors, the Strategy for the Development of Consumer Cooperatives in the Republic of Moldova has been developed for the period up to 2030, which was approved by cooperative authorities (September 2024) and is currently being implemented. The strategy and the actions of cooperatives focus on building and developing the cooperative ecosystem in the country to support their innovative economic growth and efficient operation.

References:

1. Central Cooperative Union - Bulgaria, n.d. The Global Cooperative Movement with a Vision for 2030: For a Better World. [online] Available at: https://www.cks.bg/en/Svietovnoto-koopierativno-dvizhieniie-s-poghlied-km-2030-Za-iedin-po-dobr-sviat/ [Accessed 12 July 2024].
2. Cooperatives Europe, n.d. What is Cooperatives Europe? [online] Available at: https://coopseurope.coop/our-approach/ [Accessed 12 July 2024].
3. EuroCoop, n.d. Who We Are. [online] Available at: https://www.eurocoop.coop/about-us/Who-We-Are/ [Accessed 12 July 2024].
4. European Commission, 2015. A map of social enterprises and their eco-systems in Europe. Synthesis Report. [online] Available at: Synthesis-report-FINAL.pdf (euricse.eu) [Accessed 07 August 2024].
5. European Commission, 2020. Social enterprises and their ecosystems in Europe – Comparative synthesis report. [online] Available at: https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8274 [Accessed 12 August 2024].
6. European Commission, 2021. Building an economy that works for people: an action plan for the social economy. [online] Available at: https://ec.europa.eu/social/main.jsp?catId=1537&langId=en [Accessed 15 August 2024].
7. European Parliament, 2013. European Parliament resolution of 2 July 2013 on the contribution of cooperatives to overcoming the crisis. [online] Available at: Texts adopted - Contribution of cooperatives to overcoming the crisis - Tuesday, 2 July 2013 (europa.eu) [Accessed 04 August 2024].
8. International Co-operative Alliance, n.d. Cooperative identity, values & principles. [online] Available at: http://ica.coop/en/whats-co-op/co-operative-identity-values-principles [Accessed 12 July 2024].
9. International Cooperative Alliance, n.d. Facts and figures. [online] Available at: https://ica.coop/en/cooperatives/facts-and-figures [Accessed 14 July 2024].
10. International Labour Organization, 2002. Promotion of Cooperatives Recommendation. [online] Available at: https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R193 [Accessed 04 August 2024].
11. International Labour Organization, 2019. Cooperatives & Social Solidarity Economy. Responses to key issues in the report of the Global Commission on the Future of Work. [online] Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---coop/documents/publication/wcms_705803.pdf [Accessed 04 August 2024].
12. Isenberg, D., 2011. The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship. *Institute of International and European Affairs*, Dublin, Ireland.
13. Mason, C., & Brown, R.C., 2014. Entrepreneurial Ecosystems and Growth-Oriented Entrepreneurship. [online] Available at: https://www.researchgate.net/publication/260870819_ENTREPRENEURIAL_ECOSYSTEMS_AND_GROWTH_ORIENTED_ENTREPRENEURSHIP_Background_paper_prepared_for_the_workshop_organised_by_the_OECD_LEED_Programme_and_the_Dutch_Ministry_of_Economic_Affairs_on [Accessed 24 August 2024].
14. UN, 2021. Cooperatives in social development. [online] Available at: https://documents.un.org/doc/undoc/gen/n21/202/17/pdf/n2120217.pdf [Accessed 03 July 2024].
15. UN, 2023a. Cooperatives in social development. [online] Available at: https://documents.un.org/doc/undoc/gen/n23/209/11/pdf/n2320911.pdf [Accessed 31 June 2024].
16. UN, 2023b. Resolution on promoting the social and solidarity economy for sustainable development. [online] Available at: https://undocs.org/Home/Mobile?FinalSymbol=A%2F77%2FL.60&Language=E&DeviceType=Desktop&LangRequested=False [Accessed 31 June 2024].

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EVOLUTION AND BUDGETARY TRENDS IN ARCHIȘ COMMUNE THROUGH COMPARATIVE STUDY OF EXPENDITURES IN KEY SECTORS

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Abstract: This paper provides a comprehensive analysis of the evolution of the Archiș commune's budget from 2018 to 2024, focusing on essential expenditures in critical areas such as insurance and social assistance, general public services, education, defense and public order, and housing and public development. The study aims to identify resource allocation trends, budget adjustments made over time, and their impact on financial efficiency and community development. The comparative methodology adopted in the analysis highlights budgetary variations in each sector, reflecting changes in local priorities and the administration's responses to changing economic and social conditions. Additionally, the paper relies on the expenditure forecast for 2024, providing an anticipatory perspective on the future evolution of the budget.

The detailed evaluation of budget allocations highlights the financial management strategies adopted by the local administration to optimize the use of available resources. The paper also explores how these strategies influence the sustainable development of the community, as well as the continuous improvement of public services and local infrastructure. Through this analysis, the study contributes to an in-depth understanding of local budget management, offering pertinent recommendations for better planning and resource utilization in the future.

Furthermore, the comparative analysis of expenditures in each sector reveals changes in priorities and adaptations to variable economic and social conditions, providing an integrated perspective on the impact of these changes on the community. Through a rigorous and detailed approach, the paper significantly contributes to improving budget management processes and promoting effective local development strategies.

Keywords: budget, budget planning, goods and services expenditures, local policies, local budget, prioritization, public expenditure, public investments
JEL Classification: H72, H75, R51

1. Introduction

In a period where local administration plays an essential role in economic and social development, analyzing the management of public resources becomes fundamental for understanding the efficiency and impact of implemented policies. The Archiș commune in Arad County represents a pertinent case study for investigating budgeting strategies and public expenditure management. This paper aims to thoroughly examine how the Archiș commune

manages its financial resources, addressing key aspects such as budget structure, fund allocation, and the implementation of local policies. In terms of financial management, budgeting and financial planning processes are evaluated, analyzing the efficiency of the use of financial resources and ensuring transparency in management according to financial standards (Goloșie G.D., Bogluț G.I., 2024).

The Archiș commune is a fourth-tier administrative unit located in the northeast of Arad County, with the nearest urban agglomeration being the town of Sebiș, located 15 km away, accessed via County Road 793. The commune comprises four villages: Archiș – the commune's seat, Bârzești, Groșeni, and Nermiș (Goloșie G., Bogluț G., 2023). According to the provisional results of the Population and Housing Census conducted in 2022, the population of this rural locality amounts to 1333 inhabitants.

The data analyzed in this paper are sourced from official records of the Ministry of Development, Public Works and Administration of Romania, providing a solid and objective basis for evaluating budget management strategies. This information allows for a detailed view of the commune's financial structure, including revenue sources and expenditure priorities. The analysis focuses on assessing how resources are allocated among different areas, such as infrastructure, education, and health, and on identifying the efficiency and effectiveness of these allocations (Heilmayr, R., Bradbury, J. A., 2011).

In addition to budget analysis, the paper will explore in detail the public expenditures made by the Archiș commune. It will evaluate how funds are used to support local development and meet community needs, including assessing the impact of expenditures on the residents' quality of life. This section will include a discussion on key projects and initiatives funded from the public budget and the efficiency of resource use.

In the context of public investments, the study will analyze how the Archiș commune attracts and utilizes funds for economic and infrastructural development projects (Călugăreanu, I., 2022). Investment evaluation will include an examination of the long-term effects on the local economy and infrastructure, as well as how these contribute to attracting external funds and establishing public-private partnerships.

Finally, the local policies implemented in the Archiș commune will be examined to understand how they support sustainable development and improve quality of life. The analysis will include evaluating strategies adopted to meet community needs and stimulate regional development. The discussion will cover the effects of these policies and how they contribute to achieving the strategic objectives of the local administration.

2. Research methodology

The research methodology is based on a systematic approach to analyze public resource management and development strategies in the Archiș commune. The first stage involves collecting data from official sources, including annual budgets and budget execution reports provided by the Ministry of Development, Public Works and Administration of Romania, supplemented by relevant studies and analyses. Subsequently, a detailed evaluation of the budget, public expenditures, and investments is conducted, examining how funds are allocated and utilized across various sectors. Simultaneously, the proposed budget for 2024 is analyzed,

assessing its priorities and the anticipated impact on local development. Finally, recommendations are formulated based on the analysis results, aiming to improve budgeting strategies and local policies for more efficient and sustainable administration.

3. Research results

3.1. Comparison of personnel expenses

In the 2024 budget for the commune of Archiș, expenditures on administrative personnel amount to 1,489,000 lei, representing approximately 37% of the total budget allocated for this category. Compared to previous years, this proportion reflects a significant decrease, highlighting a clear trend towards adjusting personnel expenses.

In 2018, expenditures on personnel totaled 2,203,449 lei, accounting for 65.5% of the total administration budget. This significant proportion indicated a heavy concentration of resources on salaries and benefits for administrative staff, within the context of a relatively restricted budget for other categories.

In 2019, expenditures on personnel were 2,074,270 lei, equivalent to 61.2% of the administration budget. Although there was a slight decrease in absolute value, the proportion of personnel expenses remained significant, continuing to indicate a high priority for human resources.

The year 2020, marked by the COVID-19 pandemic, had a considerable impact on the budget. Personnel expenditures increased to 2,087,963 lei, representing 72.9% of the budget. This increase reflects the economic impact of the health crisis, with a heightened need to maintain and support personnel amidst uncertainties (Restubog, S., Ocampo, A., 2020).

In 2021, there were significant changes in budget structuring. Personnel expenditures were reduced to 1,896,471 lei, representing 39.6% of the administration budget. This significant reduction highlights a cost optimization strategy, possibly following a rigorous assessment of organizational resources and needs in the context of a post-pandemic economic recovery.

In 2022, personnel expenditures increased again to 2,095,653 lei, or 46% of the total budget. This rise could be attributed to salary adjustments, salary increases, or a return to higher staffing levels after periods of austerity.

In 2023, personnel expenditures were 2,480,669 lei, representing 50.3% of the total allocated budget. Compared to 2022, where personnel expenditures were 2,095,653 lei (46.4%), this represents an 18.4% increase. Additionally, compared to 2021, with personnel expenditures of 1,896,471 lei (43.5%), there is a 30.8% increase. This trend suggests a heightened focus on human resources, possibly due to increased salaries or staff expansion.

In 2024, personnel expenditures amount to 1,489,000 lei, or 37% of the administration budget. This significant decrease compared to previous years suggests a continued trend towards optimizing human resources, with a larger allocation towards other expenditure categories, such as goods and services or development projects. The reduction in personnel expenses in 2024 compared to previous years indicates that the Archiș commune administration is revising its budgeting strategies to allocate more resources to other areas, such as infrastructure investments or essential services.

Additionally, this decrease may indicate improved organizational efficiency and better management of personnel costs, allowing for the redistribution of resources to other critical needs of the commune. The adjustment in personnel expenditures may also result from a review of organizational structures and operational needs of the local administration. This shift in budget allocation underscores a trend towards better resource balancing and may reflect the commune's efforts to respond more effectively to community needs and current challenges.

3.2. Comparing spending on goods and services

In 2018, expenditures for goods and services amounted to 978,674 lei, representing 29.1% of the administration's budget. This proportion reflects a relatively lower emphasis on the procurement of goods and services compared to personnel expenses, which were dominant that year. The budget allocated to goods and services was limited, indicating a greater focus on personnel expenses and a reduced capacity to invest in other areas.

In 2019, expenditures for goods and services were 25.1% of the total budget, showing a slight decrease compared to the previous year. This decrease can be attributed to a redistribution of budgetary resources, with personnel expenses continuing to occupy a significant share of the administration's budget, resulting in more limited allocations for goods and services.

The year 2020 was marked by the impact of the COVID-19 pandemic, leading to a decrease in the proportion of expenditures for goods and services to 19.6%. This reduction can be attributed to the prioritization of personnel expenses and emergency measures related to the health crisis. The pandemic influenced local budgets by increasing spending on essential personnel and reducing expenditures for other categories.

In 2021, expenditures for goods and services increased to 24.2% of the total budget. This increase may reflect a partial return to normalcy after the health crisis, with a more balanced redistribution of resources between personnel expenses and necessary investments for current operations and infrastructure development.

In 2022, expenditures for goods and services were 1,351,490 lei, representing 30% of the total budget. Although there was an increase compared to previous years, this proportion remains significantly lower compared to the allocation in 2024. This value reflects a relatively better balance between personnel expenses and other operational expenditures, but it does not reach the level of priority observed in 2024.

In 2023, expenditures for goods and services were 1,214,877 lei, representing 24.7% of the total budget. Compared to 2022, where allocations were 1,351,490 lei (29.9%), there is a 10.1% decrease. Additionally, compared to 2021, with expenditures of 1,295,438 lei (29.8%), the decrease is 6.2%. This decrease may indicate a reallocation of budgetary resources, with a reduced priority for operational expenditures in favor of other areas.

In 2024, expenditures for goods and services saw a significant increase, reaching 2,523,000 lei, which represents 63% of the total budget allocated to the administration. This substantial increase highlights a major strategic shift in the budget priorities of the commune of Archiș, with a much greater emphasis on current operations and infrastructure investments. It appears that the administration has decided to allocate more resources to goods and services, reflecting an increased need for operational and infrastructural improvements.

The significant increase in expenditures for goods and services in 2024 indicates an important change in Archiș's budgetary strategy. This suggests that the local administration is reallocating resources to better address current needs and support the development of infrastructure and public services. The increase in allocations for goods and services could have positive effects on the quality of public services and infrastructure, thereby contributing to the development and improvement of the local community.

3.3. Comparison of capital expenditure

In 2018, capital expenditures were limited and not specified in detail. The budget was primarily focused on personnel and goods and services expenses, reflecting a limited capacity for major capital investments.

Similarly, in 2019, capital expenditures remained limited and were not highlighted in detail in the budget. Budget allocations were predominantly concentrated on current expenditures, without significant emphasis on capital investments.

In 2020, due to the COVID-19 pandemic, capital expenditures were not specified, and the budget was mainly directed towards personnel expenses and emergency measures. The health crisis restricted the administration's ability to allocate significant resources for investment projects (Stewart, R. B., 1981).

The year 2021 marked a significant shift in capital expenditures, with a total of 1,027,312 lei, representing 21.5% of the total budget. This amount indicates a substantial commitment to development and investment projects, including construction and other infrastructure projects. Capital expenditures were highlighted as a priority in this year's budget, reflecting the commune's efforts to invest in infrastructure and public services.

In 2022, capital expenditures amounted to 586,235 lei, equivalent to 13% of the total budget. Although this proportion was lower than in the previous year, the budget still reflected a considerable commitment to investments. The percentage decrease compared to 2021 suggests a realignment of budget allocations, possibly influenced by varying priorities or economic adjustments.

In 2023, capital expenditures were 447,507 lei, representing 9.2% of the total budget. Compared to 2022, where capital expenditures were 586,235 lei (13.0%), there was a 23.8% decrease. Compared to 2021, with expenditures of 1,027,312 lei (23.4%), the decrease is 56.4%. This reduction indicates a shift in budget priorities, with less focus on development and investment projects.

In 2024, capital expenditures are not explicitly presented in the total budget, but allocations for construction and other relevant expenses are indicated in the budgets for education and other sectors. This suggests that, although not specified separately, there is still a commitment to investments, particularly in education and associated infrastructure. Allocations for construction and other expenses in education indicate that the administration continues to invest in development projects, even if specific details are not clearly presented in the general budget.

The lack of detailed specification of capital expenditures in the 2024 budget does not diminish the importance of the investments being made. Allocations for construction and other expenses in the education sector suggest that the commune of Archiș maintains its commitment to

infrastructure and public services development, even if these expenditures are not presented in detail. Compared to previous years, 2024 shows a continued focus on investments in education and infrastructure, but with an integrated approach within other expenditure categories. This approach may reflect a more flexible budget strategy, allowing the administration to respond to emerging needs and allocate resources in a more efficient and adaptable manner.
Overall, the allocation trend for capital expenditures in 2024, even in the absence of detailed presentation, suggests a continued commitment to investments, which is crucial for the long-term development of the commune of Archiș. This budgetary strategy may contribute to improving local infrastructure and public services, thereby supporting the growth and development of the community.

3.4. Expenditures on social insurance and social assistance

In 2018, expenditures for social insurance and social assistance were 983,327 lei, representing 25.3% of the total budget. This significant allocation underscores the importance placed on social services and protection, reflecting a strong focus on this sector.
In 2019, expenditures decreased to 786,891 lei, accounting for 20.2% of the total budget. This 20% reduction compared to 2018 suggests a reallocation of funds to other priority areas, such as education.
In 2020, expenditures for social insurance and social assistance increased to 808,582 lei, representing 22.8% of the total budget. This rise reflects a budgetary shift in response to the COVID-19 pandemic, although allocations remained below the 2018 level.
In 2021, expenditures were 823,251 lei, equating to 20.9% of the total budget. Despite an increase from 2020, expenditures did not return to the 2018 level, indicating a gradual adjustment of the budget to meet current community needs.
In 2022, expenditures for social insurance and social assistance rose significantly to 1,117,157 lei, representing 24.7% of the total budget. This increase highlights a higher priority given to social protection, addressing emerging community needs.
In 2023, expenditures for social insurance and social assistance were 336,334 lei, or 6.9% of the total budget. This represents a decrease of 69.8% compared to 2022, where allocations were 1,117,157 lei (24.7%). Additionally, compared to 2021, with expenditures of 823,251 lei (20.9%), the decrease is 59.1%. This substantial decline suggests a reallocation of budgetary resources with a reduced priority for social support.
The budget for social insurance and social assistance for 2024 is not explicitly detailed. However, analysis of previous years suggests that priorities may vary based on other budgetary allocations and emerging community needs.
The fluctuations in expenditures for social insurance and social assistance reflect budgetary adjustments in response to economic changes and community priorities. The substantial increase in 2022 highlights a commitment to social protection, but the sharp decrease in 2023 and the lack of details for 2024 suggest a reorientation of the budget and varying priorities for social support in the face of economic and social changes.

3.5. Expenditures on education

In 2018, expenditures for education were 386,801 lei, representing 8.6% of the total budget. This relatively modest allocation indicates that education was not a major priority within the commune's budgetary context. The budget for education in that year was primarily focused on maintaining the current operation of educational institutions without significant investments in expansion or modernization.

In 2019, expenditures for education increased significantly to 555,852 lei, accounting for 13.1% of the total budget. This substantial increase suggests that education became a higher priority, with likely investments in renovating and improving educational facilities, as well as additional support for students and teachers. This change reflects a greater emphasis on the educational sector in response to the community's needs and demands.

Expenditures for education saw a considerable decrease in 2020, dropping to 277,234 lei, which represented 6.6% of the total budget. This significant reduction can be attributed to budgetary adjustments due to the economic impact of the COVID-19 pandemic (Pripoaie, R. 2021), leading to a reallocation of resources to other critical areas such as health and social assistance. The pandemic's impact may have led to a contraction in educational budgets in favor of other priorities.

In 2021, expenditures for education were 698,452 lei, representing 13.0% of the total budget. This figure marked a significant rebound from the previous year, indicating a restoration of education's priority following the economic impact of the pandemic. The increase in allocations reflects a greater focus on recovering and improving educational infrastructure to meet educational demands and support student development.

In 2022, expenditures for education were 309,638 lei, accounting for 6.9% of the total budget. Compared to 2021, where allocations were 698,452 lei (13.0%), this represents a decrease of 55.7%. This reduction suggests a budgetary realignment and possible reallocation of resources to other sectors. Additionally, compared to 2018, when expenditures were 386,801 lei (8.6%), the decrease is 19.9%, reflecting a trend of reduced resources allocated to education.

In 2023, expenditures for education were 211,803 lei, representing 4.3% of the total budget. Compared to 2022, where allocations were 309,638 lei (6.9%), this represents a decrease of 31.6%. This decline suggests a continuation of the trend towards reduced spending on education, possibly due to the reallocation of budgetary resources to other prioritized sectors in the current context of the commune.

The specific budget for education in 2024 is not detailed in the available documents. However, based on trends from previous years, it is expected that allocations for this sector will continue to reflect current priorities and budgetary adjustments, which may include a reallocation of resources based on emerging community needs and the broader economic context. The analysis of education expenditures from 2018 to 2023 indicates significant fluctuations in resource allocation, influenced by budgetary priorities and economic context. From a higher concentration in 2019 and a rebound in 2021 to significant reductions in 2020 and 2022, these fluctuations highlight the variable impact of external and internal circumstances on the educational sector.

3.6. Expenditures on defense and public order

In 2018, expenditures for defense and public order amounted to 196,145 lei, representing 4.4% of the total budget. This allocation reflects a moderate priority given to security and public order, indicating that this sector was not at the forefront of budgetary concerns but was sufficiently funded to ensure the normal functioning of security and public order services.

In 2019, expenditures for defense and public order were 84,993 lei, accounting for 2.0% of the total budget. This significant decrease of 56.7% compared to the previous year suggests a reduced priority for this sector. This may indicate a reallocation of funds to other areas deemed more critical in that year or an adjustment of allocations based on emerging needs and demands.

Expenditures for defense and public order in 2020 are not specified, but it can be assumed that they were influenced by the redirection of resources towards more critical sectors due to the COVID-19 pandemic (Chițanu, G., 2020). If expenditures were reduced or remained unchanged, it is likely that this sector was impacted by the increased priority given to public health and social assistance.

In 2021, expenditures for defense and public order are not detailed separately but are presumed to be integrated into the general budget for public services and infrastructure. If they were maintained at levels similar to previous years, this would reflect ongoing support for maintaining order and security without having a significant impact on the overall budget.

In 2022, expenditures for defense and public order were 381,157 lei, representing 8.4% of the total budget. This significant increase from the previous year (where allocations were 84,993 lei or 2.0%) suggests a return to a higher level of investment in security and public order. This increase likely reflects a recognition of the importance of maintaining an adequate level of protection and security in light of recent developments and community priorities.

In 2023, expenditures for defense and public order were 84,993 lei, accounting for 1.7% of the total budget. Compared to 2022, where allocations were 381,157 lei (8.4%), this represents a decrease of 77.8%. This sharp reduction suggests a significant reorientation of the budget, possibly due to the reallocation of resources to other sectors considered more urgent or critical in that year.

The specific budget for defense and public order in 2024 is not detailed in the available documents. However, based on trends from previous years, it is expected that allocations will reflect recent budgetary adjustments and current administration priorities. It is possible that we will see a continuation of the trend of adjusting expenditures based on emerging community needs and the economic and social context.

The analysis of expenditures for defense and public order from 2018 to 2023 indicates significant fluctuations in resource allocation. From a modest level in 2018 and a sharp decrease in 2019, to notable increases in 2022 and a sharp reduction in 2023, these changes reflect budgetary adjustments based on priorities and current community needs. Recent reductions and reallocation of resources suggest a reevaluation of the importance of this sector in relation to other priority areas and the economic and social context of the commune.

4. Conclusion

The analysis of public resource management and development strategies in the Archiș commune has provided essential insights into the efficiency of the local administration and the impact of implemented measures. The study demonstrated that, despite its limited size, the Archiș commune optimally utilizes available resources, with a strategic allocation of funds to key sectors such as infrastructure, education, and health. The annual budget, structured and meticulously planned, reflects the administration's priorities to the community's needs.

The proposed budget for 2024, analyzed within the research, underscores the local administration's commitment to continuing the development and modernization of infrastructure and public services. The planned public investments align with the strategic objectives of the commune and indicate a proactive approach in attracting external funds and establishing public-private partnerships. The evaluation of public expenditures revealed transparent management oriented towards projects with a direct impact on the community, although there are opportunities to improve the diversification of revenue sources and coordinate investment projects with the current needs of the commune.

In conclusion, the Archiș commune represents a relevant example of good practice in managing public resources at the local level. However, to enhance the efficiency and sustainability of regional development, it is recommended to continue improving financial strategies and investment attraction processes. These measures are essential for ensuring sustainable development and maximizing economic and social benefits for the local community.

5. Directions for future research

An important direction for future research is the detailed evaluation of the impact of public investments on the economic and social development of the Archiș commune. Future studies could analyze the long-term effects of major projects on infrastructure and community well-being, using impact assessment methodologies and comparative studies.

Another direction would be the optimization of the budget and fund allocation. Future research could explore participatory budgeting models and advanced financial planning techniques to improve the efficiency of public resource management and better meet the changing needs of the community (Lockwood, M., Davidson, J., Curtis, A., Griffith, R., 2010).

Comparing local policies implemented in Archiș with those in similar communes could offer valuable insights into successful strategies. Studies could identify best practices and formulate recommendations for improving local policies based on the experiences of other administrations (Mikesell, J. L., 2003).

Finally, examining the influence of global economic changes on the local budget and development strategies could provide perspectives on the adaptability of the local administration. Studies could analyze how international economic fluctuations affect fund allocation and local strategies, as well as the measures adopted to cope with these changes.

References

1. Călugăreanu, I. (2022). Evaluarea managementului riscurilor proiectelor de infrastructură în cadrul parteneriatului public-privat din Republica Moldova - teză de doctor habilitat în științe economice, pp. 125-130.

2. Chițanu, G. (2020). Aplicarea legislației concurențiale în timpul pandemiei. Studia Universitatis Moldaviae (Seria Științe Sociale), 138(8), 208-214.
3. Goloșie, G.D., Bogluț, G.I. (2023), Diagnostic Analysis Elements Regarding the Management of the Local Budget of Archiș Commune, Emerging markets economics and business, nr. 11, editura Universității din Oradea, pp. 77-87;
4. Goloșie, G. D., Bogluț, G. I. (2024). Diagnosis of the Managerial Potential of the Public Institution. Scientific Bulletin, 29(1), 33-45;
5. Heald, D., & Hodges, R. (2020). The accounting, budgeting and fiscal impact of COVID-19 on the United Kingdom. Journal of Public Budgeting, Accounting & Financial Management, 32(5), 785-795.
6. Heilmayr, R., & Bradbury, J. A. (2011). Effective, efficient or equitable: using allowance allocations to mitigate emissions leakage. Climate Policy, 11(4), 1113-1130.
7. Lockwood, M., Davidson, J., Curtis, A., Stratford, E., & Griffith, R. (2010). Governance principles for natural resource management. Society and natural resources, 23(10), 986-1001.
8. Mikesell, J. L. (2003). International experiences with administration of local taxes: A review of practices and issues. Tax Policy and Administration Thematic Group, The World Bank, 1-44.
9. Pripoaie, R. (2021). Efectele pandemiei Covid-19 asupra șomajului și inflației., Dezvoltare economică și cercetare (pp. 45-58).
10. Restubog, S. L. D., Ocampo, A. C. G., & Wang, L. (2020). Taking control amidst the chaos: Emotion regulation during the COVID-19 pandemic. Journal of vocational behavior, 119, 103440.
11. Stewart, R. B. (1981). Regulation, innovation, and administrative law: A conceptual framework. Calif. L. Rev., 69, 1256.
12. Online website available at http://www.dpfbl.mdrap.ro/sit_ven_si_chelt_uat.html accessed at 05.07.2024.
13. Online website available at https://archis-arad.ro/wp-content/uploads/2024/02/PH-APROBARE-BVC-2024.doc accessed on 06.07.2024.
14. Online website available at https://www.recensamantromania.ro/rezultate-rpl-2021/rezultate-definitive/ accessed on 15.07.2024.

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FOREIGN DIRECT INVESTMENTS BETWEEN EUROPE AND BRICS COUNTRIES: AN ANALYSIS OF INVESTMENT POLICIES

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Abstract: This article explores the dynamics of Foreign Direct Investments (FDI) between Europe and BRICS countries, focusing on the economic, political, and regulatory factors shaping investment flows. The research highlights key trends in FDI, including the expansion of BRICS with new members such as the UAE, Iran, Ethiopia, and Egypt, and the impact this has on global investment patterns. Through a detailed analysis of policies, the study compares how BRICS and European countries approach FDI regulation, emphasizing the importance of bilateral agreements and the geopolitical implications of such investments. For instance, European nations have developed stringent screening mechanisms to protect national security, particularly from investments in critical sectors like technology and energy, while BRICS countries often adopt flexible but strategically protective policies to attract investments. Challenges like political instability, state capture, and the creation of monopolies are addressed, showcasing the risks to national sovereignty and local markets. Simultaneously, the paper identifies opportunities in areas like technology transfer, infrastructure development, and market expansion, demonstrating the potential for mutually beneficial partnerships. Through case studies and data from 2018-2022, the study provides actionable insights for policymakers and investors, emphasizing the need for adaptive strategies to mitigate risks and optimize investment

Keywords: FDI, BRICS, Europe, Investments, Cooperation, Geopolitics
JEL Classification: F21, F23, L40, O24

1. Introduction

Foreign Direct Investments (FDI) have become a crucial and indispensable element in the global economic system, serving as a key driver for economic growth and significantly enhancing the connections between nations. FDIs come in various forms, including equity capital investments, reinvested earnings, and intra-company loans. However, in this article, we will focus on analyzing the overall volume of FDIs at a broad macroeconomic level, without breaking them down into specific types. FDIs are important not only for their direct economic impact but also because they can profoundly influence political, social, and cultural aspects, shaping government policies and legislative frameworks in ways that can either benefit or harm national interests.

In recent years, the topic of FDIs between Europe and the BRICS countries has gained much attention, especially with the upcoming expansion of BRICS on January 1, 2024. The inclusion of the United Arab Emirates, Iran, Ethiopia, and Egypt in the BRICS alliance represents a major change in the global economic landscape. Together, these new members had a combined GDP of USD 1.46 billion in 2023, which is almost equivalent to Spain's GDP that year, at USD 1.58 billion (the fourth country by GDP level in European Union after Germany, France and Italy). This significant expansion not only boosts the economic power of the BRICS group but also alters the dynamics of global investment flows, making the analysis of FDIs in this context even

more relevant and necessary. However, FDIs can also present considerable risks, particularly when there is no clear, regulated, and transparent investment policy in place to manage them. When an economy becomes too dependent on FDIs, the balance of power can shift, allowing foreign investors to have significant influence over local decision-making processes. This influence, often exerted indirectly, can lead to policies that favor foreign interests over those of the host nation. Such situations pose serious risks to national sovereignty and can result in local priorities being overshadowed by external interests, undermining the country's long-term goals. The risks associated with FDIs are further increased by issues such as state capture, where corruption and aggressive lobbying by multinational companies can undermine the integrity of governance, steering public policies to benefit external interests. This can distort the political and regulatory environment, making it increasingly difficult for local governments to maintain control over their economic policies and assert their authority. The erosion of national sovereignty becomes particularly clear when host countries are forced to follow strategic directions or political priorities set by foreign investors, often under the looming threat of reduced investment or capital withdrawal, which can have severe economic consequences.

Moreover, the influx of FDIs can also lead to significant market distortions, especially when these investments result in the creation of monopolies or oligopolies. This concentration of market power can stifle competition, putting local businesses at a disadvantage compared to large international corporations that have more resources, influence, and access to global markets. Over time, this can weaken the national economy, reduce market diversity, and ultimately hinder the long-term development and sustainability of the host country, potentially leading to economic instability and social unrest.

2. Literature review

Investment policies are an indispensable part of the economic machinery, as they influence how countries interact on the global stage, affecting capital flows, infrastructure development, and job creation. In this context, the BRICS countries and those in the European Union adopt different approaches, reflecting different economic and political priorities, largely due to the differing ideologies of the two organizations.

The investment policy of the BRICS countries is characterized by considerable flexibility and is often aimed at attracting foreign direct investments (FDI) in strategic sectors such as infrastructure, energy, technology, and manufacturing. These nations see FDIs as an essential tool for stimulating economic growth, creating jobs, and developing emerging industries. China and India, in particular, have developed investment policies that encourage public-private partnerships and investments in advanced technologies, while Russia focuses its efforts on attracting investments in natural resources and energy. Brazil and South Africa also promote investments in agriculture and mining to boost rural and industrial development. BRICS policies are often characterized by adaptability to the changing global context, but these countries may impose restrictions or strict requirements to protect local industries and maintain control over sensitive sectors. Additionally, BRICS investment policy often reflects internal political priorities and long-term economic strategies, which can create challenges for foreign investors in terms of regulatory transparency and predictability (UNCTAD, 2021).

The investment policy of the European Union is more coordinated and regulated at a supranational level, reflecting the common values and objectives of the member states. The EU promotes an open and transparent investment environment, focusing on stability and economic competitiveness. EU priorities include investments in high-value-added sectors such as green technology, innovation, digitalization, and financial services. The EU also places great importance on high standards of investor protection, along with strict regulations in the areas of environment and labor. In the context of bilateral investment treaties (BITs) that the EU concludes with countries outside the Union, EU legislation imposes a strict framework for these investments, emphasizing respect for high standards regarding human rights, transparency, and the rule of law. Foreign investors in the European Union thus benefit from a more predictable and stable regulatory environment, which reduces risks and offers a high level of legal protection. EU investment policies are also aimed at ensuring a functional and competitive internal market, while also protecting the Union's strategic interests through instruments such as the screening of foreign direct investments (European Commission, 2020).

Regulating foreign direct investments (FDI) from China in European Union countries involves several key legislative frameworks and regulations at both the EU and national levels. Starting with the EU Regulation on the Screening of Foreign Direct Investments (Regulation (EU) 2019/452), adopted in March 2019, the European Union established a comprehensive framework for monitoring and assessing foreign direct investments within its member states. This regulation empowers member states to scrutinize and, if necessary, block investments that are considered a threat to national security, particularly in critical infrastructure or sensitive technology sectors. For instance, Chinese investments in areas such as telecommunications, energy, and 5G technology have been subjected to rigorous review in certain member states due to security concerns (European Commission, 2019).

At the national level, Germany serves as a notable example with its National Foreign Investment Law (Außenwirtschaftsgesetz - AWG), which grants the government authority to review and potentially block foreign investments in sectors deemed sensitive. In 2018, this law was utilized to prevent the acquisition of Leifeld Metal Spinning by a Chinese entity on the grounds of national security (Federal Ministry for Economic Affairs and Energy, 2020). Similarly, France, through its Monetary and Financial Code, regulates foreign investments in strategic sectors and requires government approval for acquisitions in fields such as defense, energy, and telecommunications. In 2014, France expanded this list of protected sectors in response to growing Chinese interest in French companies, particularly in the energy sector (French Treasury, 2014).

Italy, through its "Golden Power Law," provides the government with the power to block or impose conditions on foreign investments in strategic industries, including defense, energy, and communications. In 2020, Italy invoked this law to prevent a Chinese company from acquiring a stake in the telecommunications firm Fastweb, citing national security concerns (Italian Presidency of the Council of Ministers, 2020).

These legislative frameworks illustrate how European Union countries, both at the EU and national levels, manage and regulate foreign direct investments, including those from China, to safeguard national interests and ensure economic security and stability.

The investment policies of the BRICS countries are characterized by a combination of economic openness and strategic protectionism, with each country having its own rules and priorities.

China has a complex regulatory framework for foreign direct investments (FDI), including a negative list of sectors where investments are prohibited or restricted, and imposes strict requirements for partnerships with local firms and technology transfer in priority sectors like technology and innovation (UNCTAD, 2021).

India has significantly liberalized its FDI regime, actively promoting investments in manufacturing, infrastructure, and technology, but maintaining caps and special requirements in strategic sectors such as media, defense, and civil aviation (Government of India, 2020).

Russia allows foreign investments in most economic sectors but imposes restrictions in areas considered strategic, such as energy, natural resources, and the defense industry, and favors strategic partnerships between foreign investors and state-owned companies (Russian Federation, 2021).

Brazil is one of the most open BRICS economies for FDI, offering foreign investors nearly unrestricted access to most sectors but imposing restrictions on the acquisition of agricultural land and protecting certain sectors like media and aviation (Government of Brazil, 2019).

South Africa has a relatively open FDI regime, promoting investments in sectors that can stimulate economic growth and job creation, but imposing requirements for local development and employment in strategic sectors like telecommunications and natural resources (Government of South Africa, 2020).

Thus, while these countries are eager to attract foreign investments to boost economic growth, they often impose strict conditions to protect sensitive sectors and ensure that the economic benefits align with their national development goals, and European investors must navigate a complex regulatory landscape but can find significant opportunities for partnerships and economic development in these markets.

3. Data analysis

As previously highlighted, the analysis of foreign direct investment (FDI) flows in BRICS countries, based on data from the period 2018-2022 provided by the World Bank, offers a clear overview of the dynamics of foreign investments in these emerging economies. Each of the BRICS countries has unique characteristics in attracting investments, influenced by economic, political, and global factors. In the following sections, we will analyze FDIs in the BRICS countries (Brazil, India, China, and Russia), with a focus on European investment exposure and the associated risks.

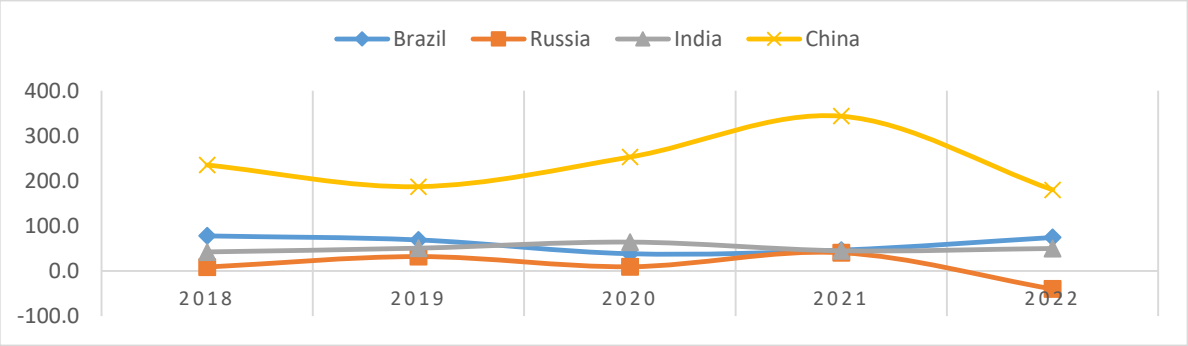

Figure 1: Evolution of FDIs in key BRICS countries from 2018-2022

Source: World Bank

As observed from the graph above, FDIs in Brazil have been relatively stable, ranging from $46 billion to $79 billion, with the only exception being in 2020, when FDIs were significantly affected by the COVID-19 pandemic. The pandemic caused a slowdown in the global economy, and many companies postponed or redirected their investments to other markets. In particular, the sectors most affected in Brazil were agriculture and natural resources, which are essential to the Brazilian economy.

In the case of Russia, the trend has been downward, with a pronounced decline, reaching negative values in 2022 due to severe economic sanctions imposed by the West, especially after the invasion of Ukraine in 2022, leading to a massive withdrawal of investments.

India experienced a relatively stable level of FDIs, with the highest value surprisingly reached in 2020 during the pandemic. This growth was significantly driven by the development of the IT sector, where India has a global competitive advantage due to its low labor costs.

In China, FDIs peaked in 2021 at $344 billion, followed by a sharp drop in 2022. This decline was influenced by the trade dispute with the USA and other Western powers, as well as the "zero COVID" policy implemented in 2022, which significantly reduced the attractiveness of the Chinese market for investors.

Other BRICS countries such as South Africa, UAE, Iran, Ethiopia, and Egypt were not included in the analysis due to a lack of reliable data on FDIs or their relatively low levels.

Table 2: Main investors in BRICS countries in 2022

2022				
From/To	Brazil	Russia	India	China
USA	18,0%		9,0%	
Netherlands	14,0%		7,0%	2,4%
Spain	5,0%			
France	3,0%			
UK	2,0%			
Japan	2,0%		6,0%	2,4%
Mauritius			26,0%	
Singapore			23,0%	5,6%
Hong Kong				72,6%
Virgin Islands				3,5%
South Korea				3,5%
Germany				1,4%

Source: UNCTAD

The main investor in Brazil is the USA, accounting for approximately 18% of total net FDI inflows, followed by the Netherlands with around 14%, Spain with 5%, France with 3%, and the UK and Japan with 2% each. This graph highlights that the USA is Brazil's main economic partner, reflecting close ties and a high level of interest from American investors in Brazil's natural and agricultural resources. It is also worth noting that approximately 24% of the total net FDI inflow comes from European countries, making Brazil somewhat exposed to economic and political risks in the region, which could impact it if there is economic instability in Europe. As for India, Mauritius is the main investor with 26%, followed by Singapore with 23%, the USA with 9%, the Netherlands with 7%, and Japan with 6%. Investments from Mauritius are explained by the tax advantages offered by the country. Multinational companies often use Mauritius as a tax haven to invest in India. Singapore is the second-largest source of FDIs, reflecting strong economic and trade ties between the two Asian countries. The USA and the Netherlands also play significant roles, followed by Japan, with all three countries having a major presence, especially in the technology and industrial sectors. Unlike Brazil, India is less dependent on European investments, with the Netherlands being the largest European player with a 7% share.

In China, the main investor is Hong Kong, accounting for 72.6% of total FDIs, followed by Singapore with 5.6%, the British Virgin Islands and South Korea with 3.5% each, and the Netherlands and Japan with 2.4% each, while Germany accounts for 1.4%. To better understand the origin of foreign investments from Hong Kong, according to the UNCTAD World Investment Report 2023, the largest investor in Hong Kong is the British Virgin Islands, representing 30.9% of total foreign direct investment worth $117.7 billion. This indirectly highlights China's reliance on investments coming from the British Virgin Islands. Being a tax haven, there is a lack of relevant data on the largest foreign investors from this region.

Russia was excluded from this analysis due to the lack of official data on major foreign investors in the country, as a result of Western sanctions imposed in 2022 after the invasion of Ukraine.

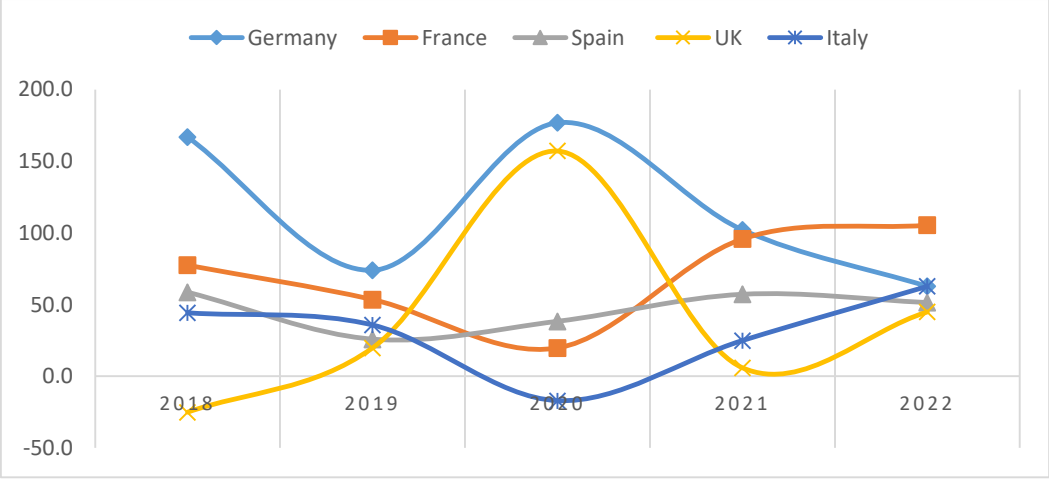

Figure 2: Evolution of FDIs in major European countries from 2018-2022

Source: World Bank

In 2020, FDIs in Germany peaked at $176.9 billion, driven by the reinvestment of earnings by foreign companies, which saw Germany as a safe destination in the context of the pandemic due to its economic stability and effective support measures. Additionally, Germany, being highly

developed in the industrial sector, benefited from consistent demand for technological and industrial goods, while investments in green energy and digitalization attracted additional capital. In the UK, FDIs reached their highest point in 2020 at $157.2 billion, mainly due to the official completion of Brexit, which created short-term investment opportunities as companies adapted to the change. London, the capital of England, remained an attractive global financial center even amid the uncertainties related to the pandemic. However, after 2020, post-Brexit uncertainties, new trade agreements, and the effects of the pandemic led to significant declines in FDIs, reflecting the economic and trade challenges facing the British economy during the transition period.

Spain's FDIs were less affected by the pandemic, although there were some declines in sectors such as tourism and real estate. However, these decreases were not significant, and the country managed to offset them through other sectors of the economy, with FDI flows remaining relatively stable due to continued interest in the country's energy and digital infrastructure. The stability of FDIs suggests that, despite economic challenges, Spain remains an attractive destination for long-term investments.

France saw a drop in FDI inflows from $53.6 billion in 2019 to $19.7 billion, primarily due to the severe impact of the pandemic. However, this was not as dramatic as in Italy, which was the most affected country among those analyzed, with net FDI inflows falling from $35.76 billion in 2019 to -$17.05 billion in 2020. Italy was one of the first and hardest-hit countries by the COVID-19 pandemic, facing a deep health and economic crisis, exacerbated by the aging population and stricter quarantine measures compared to other European countries.

Table 2: Main investors in European countries in 2022

2022					
From/To	Germany	France	Spain	UK	Italy
Luxembourg	21,1%			6,1%	17,7%
Netherlands	17,5%	6,5%		10,9%	23,7%
USA	10,0%	18,3%	18,8%	33,7%	
Switzerland	8,2%	14,1%		3,7%	6,1%
UK	8,2%	11,4%	11,3%		7,6%
France	5,3%		11,4%	5,0%	17,6%
Austria	4,1%				
Italy	3,9%	6,7%	8,9%		
Japan	3,5%			4,6%	
Germany		14,1%	9,6%		9,2%
Belgium		6,2%		4,4%	
Mexico			5,3%		
UK Offshore Islands				10,2%	

Source: UNCTAD

Unlike the three BRICS countries analyzed in this article, we can observe a significant difference in FDI levels between European countries and BRICS. In none of the five European countries analyzed do we find China, Brazil, Russia, or India among the top investors, highlighting that European countries are not dependent on investments from BRICS. Instead, FDI flows to these European economies largely come from developed countries such as the USA, European nations (Netherlands, France, Germany, Italy, Switzerland, Luxembourg), and Japan. This shows that European economies are predominantly interconnected, with investors coming mainly from other developed economies.

The main investors in Germany are Luxembourg with 21.1%, followed by the Netherlands with 17.5%, the USA with 10%, Switzerland with 8.2%, the UK with 8.2%, France with 5.3%, Austria with 4.1%, Italy with 3.9%, and Japan with 3.5%. This demonstrates Germany's deep economic connections with European economies.

In Spain, the main investors are the USA with 18.8%, the UK with 11.3%, France with 11.4%, Italy with 8.9%, Germany with 9.6%, and Mexico with 5.3%. Similar to Germany, this reflects Spain's dependence on European and US economic partners, with no significant influence from BRICS countries.

In Italy, the largest foreign investors are the Netherlands with 23.7%, France with 17.6%, Luxembourg with 17.7%, Germany with 9.2%, the UK with 7.6%, and Switzerland with 6.1%. Again, there are no major investors from BRICS countries, validating the similar FDI pattern characteristic of European countries and advanced economies.

The same applies to France and the UK, where no major BRICS players are present, further highlighting the low dependence of European countries on BRICS.

4. Conclusion

In conclusion, the analysis of foreign direct investment (FDI) flows in BRICS countries (Brazil, Russia, India, China, South Africa) and key European economies (Germany, France, the UK, Italy, and Spain) has demonstrated significant differences in the structure and origin of these investments. On the one hand, BRICS countries, especially India and China, have relied heavily on regional investments or tax havens such as Mauritius, Hong Kong, or the British Virgin Islands. This dependence on regional investors and emerging economies reflects a more limited diversity of external capital sources and weaker connections to developed economies.

On the other hand, the European countries analyzed show no significant dependence on BRICS investments. Instead, they are highly interconnected with each other and with other developed economies such as the USA and Japan. This interdependence among developed economies in Europe and North America highlights the stability and maturity of European markets, which attract investments that are less vulnerable to economic and geopolitical shocks from emerging economies.

Thus, we have demonstrated that European economies are far more integrated into the global economic networks of developed countries, while BRICS countries rely more on capital from regional sources or countries with favorable tax strctures. This reflects differences in the level of economic development and the long-term attractiveness of these markets to investors.

References

1. Government of Brazil. (2019). Investment Guide to Brazil 2019. Retrieved 15 Sep. 2024 from https://www.investexportbrasil.gov.br/index.php/en/guide-to-invest-in-brazil
2. Government of India. (2020). *Foreign Direct Investment Policy 2020*. Retrieved 15 Sep. 2024 from https://dpiit.gov.in/sites/default/files/FDI-PolicyCircular-2020-29October2020.pdf
3. Government of South Africa. (2020). Promotion and Protection of Investment Act 2015. Retrieved 15 Sep. 2024 from https://www.gov.za/documents/promotion-and-protection-investment-act-22-dec-2015-0000
4. Hooijmaaijers, B., & Keukeleire, S. (2020, March 31). The BRICS Countries and the European Union. Oxford Research Encyclopedia of Politics. Retrieved 16 Sep. 2024, from https://oxfordre.com/politics/view/10.1093/acrefore/9780190228637.001.0001/acrefore-9780190228637-e-1475
5. Hunya, G., & Stöllinger, R. (2009). Foreign Direct Investment Flows between the EU and the BRICs. The Vienna Institute for International Economic Studies (wiiw), Research Report No. 358. Retrieved 16 Sep. 2024 from https://hdl.handle.net/10419/204130
6. United Nations Conference on Trade and Development (UNCTAD). (2021). *World Investment Report 2021: Investing in Sustainable Recovery*. Retrieved 15 Sep. 2024 from https://unctad.org/webflyer/world-investment-report-2021
7. United Nations Conference on Trade and Development (UNCTAD). (2022). *World Investment Report 2022: International tax reforms and sustainable investment*. Retrieved 16 Sep. 2024 from https://unctad.org/publication/world-investment-report-2022
8. Nistor, P. (2015). FDI implications on BRICS economy growth. Procedia Economics and Finance, 32, 981-985. Retrieved 16 Sep. 2024 from https://www.sciencedirect.com/science/article/pii/S2212567115015579
9. Russian Federation. (2021). Foreign Investment Law. Retrieved 15 Sep. 2024 from https://economy.gov.ru/material/file/bf9e7f89e4b35423a7f1b70e7a1d8b9b/Foreign_Investment_Law.pdf

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CUTTING THROUGH THE NOISE: UNDERSTANDING THE USAGE OF THE CUSTOMER JOURNEY MAPPING

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Abstract: In the last few decades, due to the booming of the Internet and the flourishing of new technologies connected to it, there has been a major change on how people interact with businesses. With the development of smart devices, companies started to unwrap the power of customer behaviour. A new kind of marketing, based on customer knowledge, emerged.

However, firms are still grappling with how to understand their consumers and it is still ongoing to change how companies and customers interact. Contrary to traditional media, the Internet allows for amassing data, associated with millions of users, companies encompassing a constantly evolving amount of online marketing channels.

To address this new complexity, the current paper contributes to the existing literature and theories regarding customer behaviour, customer journey and customer experience and explains the connection between the three concepts. This allows a better understanding of the mechanisms underneath consumers' decisions and actions taken across different purchase phases. Built upon the literature reviewed, a customer journey mapping model is suggested and explained.

Finally, customer journey mapping is necessary for companies to determine and analyze customer touchpoints in purchasing company's products and/or services. Companies have to be able to develop customer journey mapping in order to analyze customer behaviour from their customer journey. Once companies understand the customer journey from the customer's point of view, they can actually see where customer experience lags are present, focus back in on them and develop.

Keywords: consumer behaviour, customer journey, customer experience, customer journey mapping, touchpoints.
JEL Classification: M30, M31.

1 Introduction

Customer journey mapping is a method that has recently attracted considerable attention from both managers and academia. It integrates the activities, decisions, touchpoints, emotions and pain points that customers face during the purchase process into a map.

Customer journey mapping helps companies identify key points where communication is most likely to break down, allowing businesses to better understand the experiences customers have when they interact with the products and/or services offered under certain brand. These interactions, called touchpoints, are constantly growing in number (both digital and offline) and are used by customers in a variety of ways.

Today's customers value not only the traditional aspects of buying a brand, price and functionality (for example), but also intangible aspects that are related to the overall customer experience. Indeed, various methods of building and incorporating journey maps into business operations can be found online, but the scholarly literature needs extensive research on the topic.

The current paper is structured as follows: section one is dedicated to a short analysis of the existing literature as well as to the explanation of the concepts that facilitate the understanding of research. Then, sections two describes customer journey mapping. Section three sets out a proposal for a visual model of the customer journey map. The main components of the model are presented and explained. The last section concludes the paper and provides an outlook. The findings of this paper should make a contribution to pave the way for further usage of customer journey maps as the visual model helps companies understand every step a customer takes, allowing for strategic enhancements that can elevate the shopping experience.

2. Literature review

In this section, the three research areas that support the current study are presented and explained through a short analysis of the existing literature and knowledge. These are as follows: 1) customer journey, 2) customer experience and 3) consumer behaviour. Consequently this chapter aims to provide the required information for a better understanding of the presented research problem.

As Kuehnl *et al*. (2019) highlight, a widely accepted definition of customer journeys is still lacking. And indeed, many of the papers that have been reviewed for the purposes of this research failed to clearly define the term customer journey. In addition, there are authors (Anderl *et al*., 2016; Hildebrand and Schlager, 2019; Batra and Keller, 2016) that use path-to-purchase and customer journey terms as synonyms and this is adding to further confusion in understanding the customer journey concept.

Despite the fact that a number of authors discuss path to purchase, definitions are usually not given. Jones *et al*. (2018) state that a shopper engages in a subset of consumer behaviors that is the path to purchase for a particular occasion. Consumer behavior can be defined as the process that consumers experience when they make purchases, which includes a series of factors, internal and external, that shape and influence their decisions. These factors can be grouped into 1) cultural factors, 2) social factors, 3) personal factors, and 4) psychological factors (Singh, Dhayal, Shamim, Humanity, 2014).

Additionally, Jones *et al*. highlight the fact that once customers have identified a specific purchase need, then those customers are in the so called "shopping mode" - an active process that involves the outcome of a purchase decision as a result of engagement with path-to-purchase. This statement is also supported by other authors (Shanker *et al*., (2011); Mccollough *et al*. (2000)). There are also alternative terms related to experiences that have been used in previous research on this topic, referred to as consumer journeys/experiential consumption journeys (Akaka and Schau, 2019). In general, it can be summarized that there are many terms that are related to customer journeys and this fact demonstrates a lack of clarity and consistency and highlights the need for better framing in order to understand the concept of the customer journey.

This paper views *customer journey as consisting of various touchpoints created in a way that organizes the best communication between a customer and a company*. Customer touchpoints are all the different ways consumers experience a product or service, offered under a certain brand, from the moment they first become aware of it to the moment they dispose of it. Many articles describe touchpoints as a direct or indirect contact moment, service event or encounter

(Følstad *et al*., 2018) that occurs between a company and a customer (Heuchert, 2019) at various points in the customer's experience (Lemon and Verhoef, 2016). Moreover, these encounters can be physical or non-physical, active or passive, and can be captured by any of the human senses (Bascur, Rusu and Quiñones, 2018).

Touchpoints are usually chronologically ordered along the horizontal axis of the customer journey script and thus form a timeline sequence (Rosenbaum *et al*., 2017), so, from the customer's perspective, it resembles a process (Halvorsrud *et al.*, 2016). However, with the spread of new technologies, the retail environment is undergoing a paradigm shift, which has made this sequence of events less linear and more complex (Vakulenko., 2019). Instead, customers no longer use few touch points to move from one stage of the purchase process to another, as journeys are now a combination of multiple touch points (Herhausen *et al*., 2019).

Research by Micheaux and Bosio (2019) explains that the value of customer experience at each touchpoint influences the perceived quality of the relationship, which in turn influences commitment of the touchpoint, which can occur across online and offline channels. Prospective research should focus on the variety of touchpoints used from the customer's perspective. This will allow companies to gain additional insight into these touchpoints that are critical to improving the customer experience.

Given the evolution of market development, the value of customer experience ultimately changes – from being ignored to emphasizing its great importance (see Table 1). As indicated in the table above, the idea of user experience has become more relevant when Pine and Gilmore (1998) presented the progression of economic value. The basic idea is that during the purchase process, experiences are seen as an economic proposition and serve as the next point after commodities, goods, and services.

Customer experience is about "what customers think, feel, and do," which is the result of the interactions that occur between them and companies along the customer journey (Gao *et al*., 2019, p. 2). These responses that customers give to each interaction with a brand can be 1) cognitive, 2) emotional, 3) behavioural, 4) sensorial and 5) social (Vakulenko *et al*., 2019). In the early 2000s, however, customer experience gained a lot of awareness and several contributions have focused their attention on the topic and experience as a new form of value creation for both customers and companies (Gentile *et al.* 2007).

Table 1. Customer Experience Literature

Year	**1960's**	**1970's**	**1980's**	**1990's**	**2000's**	**2010's**
Model	**Consumer Buying Behaviour Process Models**	**Customer Satisfaction and Loyalty**	**Service Quality**	**Relation-ship Marketing**	**Customer Relation-ship Manage-ment**	**Customer Engage-ment**

Research	Howard & Sheth (1969)	Bushkirk & Rothe (1970) Sheth (1970) Markin (1971) Webster &Wind (1972)	Parasuraman, Zeithaml, & Berry (1988)	Berry (1995) Sheth & Parvatiyar (1995) Pine and Gilmore (1998)	Rust, Zeithaml, & Lemon (2000) Payne & Frow (2005)	Brodie, Hollebeek, Jurić & Ilić (2011) Vivek, Beatty & Morgan (2012) Brodie, Ilic, Juric & Hollebeek (2013) Kumar & Pansari (2016) Kumar (2017)

Source: Compiled by the author for the purposes of this paper

3. Customer journey mapping

Customer journey mapping, which originated within market research in the 1960s and 1970s (Crosier and Handford, 2012), visualizes the main touchpoints and stages that customers must pass through when doing business with a company. Customer journeys may seem simple and straightforward. However, customers go through various stages and experiences before they buy a particular brand and actually become customers of the company.

As customers base their decisions on interactions across multiple media types, many devices and different locations, the challenge for companies, to interact at critical moments that can influence purchase decisions, is growing. Among the potential customers, there is always a group of people who have thought about buying a brand but did not actually convert. While secret shoppers and focus groups can be effective tools for gathering information about customers' experiences and emotional responses, neither approach specifically addresses how customers react to products and services at different stages of their journey (Crosier and Handford, 2012).

Therefore, it is important for companies to understand customer experiences throughout the customer journey, to identify the gaps between and eliminate them in order to provide better customer experiences throughout the customer journey and encourage more potential customers to convert (see Table 2). This is where the need for customer journey mapping comes in. Because journey mapping is a flexible method, it can be modified to serve different types of companies.

Table 2. Customer journey map and its importance

How to create a customer journey map	Why is it important?
Set a clear goal	**Understanding customer paint points**
Create customer personas	**Increasing customer retention**
Identify target personas for a particular journey map	**Tracking (staff) performance**
List touchpoints	**Planning better marketing strategies**
Detail available and needed resources	
Go through the customer journey	**Delivering better customer experiences**
Make any necessary changes	

Source: The author for the purposes of this paper

Customer journey maps involve mapping out the different steps a customer makes when trying to complete an activity. Customer journey maps are used to illustrate people's experiences as customers of a particular company. The so called maps typically include choices related to the purchase process, such as a decision to purchase a product or service or a decision to remain a loyal customer. Customer journey maps typically contain different interaction phases, touchpoints, different aspects of the customer experience (such as actions, feelings, goals, and pain points), activities, and some kind of analysis of the customer data collected.

4. Visualizing the customer journey map

The evolution of non-linear customer journeys makes the map look a lot more confusing for brands. Many companies use and have used customer journey mapping, but there are multiple ways to create customer journey maps and they are usually not consistent or mutually compatible. In general, there is no standard for customer journey maps, as they are visual tools that support discussions about improving the different types of journeys customers will experience.

A customer journey map is a visual representation of the touchpoints between a customer and a company throughout the entire relationship. The idea of a customer journey map is to have a simple visualization that can be interpreted by a wide audience. Contrary to business process models, a customer journey map does not include advanced gateways such as choices, parallels, or cycles. Figure 1. shows an example of a customer journey map. This complete picture of the stages a customer will face during their journey helps marketers predict their behavior, anticipate their needs and guide the company's response.

Figure 1. A customer journey map

Source: The author for the purposes of this paper

1) *Purchase process*. Companies want to collect data to map the customer journey from start to finish. Typically, these stages are awareness, consideration, and decision. At this stage, it is important for companies to understand whether their customers are considering a single product that is offered under a particular brand, or whether they are looking for some benefit that may span multiple products and/or services that are sold under a certain brand. Companies should continue raising awareness even during the consideration phase.
2) *User actions* in the figure above refers to the actions customers need to take at each stage of the purchase process. For example, whether or not they should register and what their online shopping cart experience is like. At this phase, companies need to identify how customers move through the journey and how they behave at each stage.
3) *Emotions.* Consumers are emotional creatures and it is good for companies to understand the potential emotional state of customers at each stage of their journey in order to prevent churn.
4) *Pain points.* As mentioned above, minor inconveniences can deter a company's customers from making a purchase. That is the reason why companies need to identify any potential pain points in order to help determine why their customers may be experiencing a certain negative emotion. Companies can do this by simply asking their customers directly or indirectly (for example by the customer service team).
5) *Solutions.* Companies need to look for ways to improve the buying process so that their customers experience fewer pain points along the journey.
Mapping the customer journey allows businesses to find the key moments that create frustration and satisfaction in the customer journey and helps companies chart a course towards better communication with their customers by giving them a complete picture of the process they go through on their way to making a purchase. By defining each step and mapping out the path, companies will find places where the process gets bogged down or some (not always obvious) steps they are missing. Companies can even find ways to create shortcuts to eliminate steps that can increase efficiency and reduce friction. Defining the journey for multiple processes will quickly show how complex things can get. But it will likely help companies identify where paths cross and where they can eliminate duplication.

5. Why is customer journey mapping important?

Mapping the customer journey allows companies to see things from customers point of view and to deliver information, messages and services in the most appropriate time through the most appropriate channels. It helps businesses identify the moments of truth where a service or communication breakdown is most likely and where they are most valued. In addition to providing companies with the customer's perspective, the customer journey allows them to gain valuable insight into the overall consumer experience and how they choose and integrate channels during the purchase process (Følstad *et al*., 2018).
Additionally, customer journey mapping can also be a powerful strategic weapon used to gain competitive advantage. Because a customer journey map is designed based on a company's understanding of customer needs, although competitors may be able to copy some of the touchpoints of their rivals' customer journeys, they will not know the sequence of events or the

reasons underneath the design of that particular sequence, and thus will not be able to achieve the same level of success (Norton, 2013).

Customer journey maps are also useful for studying the type of experience a firm currently provides to its customers and for identifying what can and should be improved (Terragni and Hassani, 2018). This information is then used to design a new and improved experience (Heuchert, 2019).

The team-oriented nature of journey mapping, combined with a visual approach for organized discussion, has *four main advantages*.

1) Collaboration has the potential to create positive team dynamics and strengthen mutual commitment to a project. The visual nature of journey mapping facilitates active participation and listening within a diverse company group where members have different strengths and weaknesses and prefer different communication methods.

2) Creating visualizations also encourages creativity and divergent thinking and promotes productive dialogue and debate.

3) Creating visuals allows companies to address the complex non-linear nature of customer journeys and encourages systems-level thinking. This also demonstrates the importance of context as situations are allowed to intertwine and connect. Arguably, this dynamic is the most important component of customer journey maps.

4) The final visual product allows companies to quickly absorb a systematic overview of a customer's journey.

6. Conclusion

Customer journey mapping creates an overview of the customer experience and maps how customers move through the sales funnel. It is critical for companies to understand and optimize the customer experience across various touchpoints and customer interactions with the business. Customers experience roadblocks, dead ends, and frustration along their journey. Collecting customer feedback at every point of contact or interaction can help companies identify their customers' pain points and take appropriate actions to resolve customer issues and avoid them in the future. The more friction companies put in front of their potential customers, the less likely they are to complete the journey. Customer journey mapping also allows companies to identify opportunities to improve and enhance the overall customer experience.

References

1. Akaka, M.A., Schau, H. J., 2019. Value creation in consumption journeys: recursive reflexivity and practice continuity, *Journal of the Academy of Marketing Science*, 47(3), pp. 499-515.
2. Anderl, E. Becker, I., von Wangenheim, F., Schumann, J. H., 2016. Mapping the customer journey: Lessons learned from graph-based online attribution modeling, *International Journal of Research in Marketing*, 33 (3), pp. 457-474.
3. Bascur, C., Rusu, C., Quiñones, D., 2019. User as Customer: Touchpoints and Journey Map. In: Ahram, T., Karwowski, W., Taiar, R. (eds) Human Systems Engineering and Design. IHSED 2018. Advances in Intelligent Systems and Computing, vol 876. Springer, Cham. https://doi.org/10.1007/978-3-030-02053-8_19.
4. Batra, R., & Keller, K. L., 2016. Integrating Marketing Communications: New Findings, New Lessons, and New Ideas. *Journal of Marketing*, 80(6), pp. 122-145.

5. Berry, L.L. 1995. Relationship marketing of services—growing interest, emerging perspectives. *JAMS* 23, pp. 236–245 https://doi.org/10.1177/009207039502300402.
6. Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A. 2011. Customer Engagement: Conceptual Domain, Fundamental Propositions, and Implications for Research. *Journal of Service Research*, *14*(3), 252-271. https://doi.org/10.1177/1094670511411703.
7. Brodie, R. J., Ilic, A., Juric, B., Hollebeek, L., 2013. Consumer engagement in a virtual brand community: An exploratory analysis, *Journal of Business Research*, 66 (1), pp. 105-114.
8. Buskirk, R., Rothe, J. Consumerism—An Interpretation. American Marketing Association, Volume 34, Issue 4. https://doi.org/10.1177/002224297003400410.
9. Crosier, A., & Handford, A. (2012). Customer Journey Mapping as an Advocacy Tool for Disabled People: A Case Study. *Social Marketing Quarterly*, *18*(1), pp. 67-76.
10. Følstad, A., Nordheim, C.B., Bjørkli, C.A., 2018. What Makes Users Trust a Chatbot for Customer Service? An Exploratory Interview Study. In: Bodrunova, S. (eds) Internet Science. INSCI 2018. *Lecture Notes in Computer Science*, 11193. https://doi.org/10.1007/978-3-030-01437-7_16.
11. Gentile, C., Spiller, N. & Noci, G. 2007. How to Sustain the Customer Experience: An Overview of Experience Components that Co-create Value with the Customer. *European Management Journal*, 25 (5), pp. 395–410.
12. Halvorsrud, R., Kvale, K. and Følstad, A., 2016, Improving service quality through customer journey analysis, *Journal of Service Theory and Practice*, 26 (6), pp. 840-867.
13. Heuchert, M., 2019. Conceptual Modeling Meets Customer Journey Mapping: Structuring a Tool for Service Innovation, pp. 531-540. 10.1109/CBI.2019.00068.
14. Hildebrand, C., Schlager, T., 2019. Focusing on others before you shop: exposure to Facebook promotes conventional product configurations. *J. of the Acad. Mark. Sci.* 47, pp. 291–307.
15. Howard, J.A., Sheth, J.N., 1969. The theory of buyer behavior (No. 658.834 H6).
16. Jones, R.P., & Camp, K.M. & Runyan, R.C., 2018. Exploring the impact of shopper ethnicity through the path-to-purchase framework, *Journal of Retailing and Consumer Services*,. 45(C), pp. 152-162.
17. Kuehnl, C., Jozic, D. & Homburg, C., 2019. Effective customer journey design: consumers' conception, measurement, and consequences. *J. of the Acad. Mark. Sci.* 47, pp. 551–568.
18. Kruman, Y., 2017. The Importance of Customer Experience In: The Age of Instant Gratification. Forbes.
19. Lemon, K., Verhoef, P., 2016. Understanding Customer Experience Throughout the Customer Journey. *Journal of Marketing*, 80(6), pp. 69-96.
20. Kumar, V., Pansari, A., 2016. Competitive advantage through engagement. *J. Mark. Res*.53 (4), pp. 497–514.
21. Markin, R. J. 1971. Consumerism: Militant Consumer Behavior: A Social and Behavioral Analysis. *Business & Society*, *12*(1), pp. 5-17. https://doi.org/10.1177/000765037101200101.
22. McCollough, M. A., Berry, L. L., & Yadav, M. S. 2000. An Empirical Investigation of Customer
23. Norton, D. , W. (2013). Using the customer journey to road test and refine the business model. *Strategy & Leadership*, 41(2), pp. 12-17.
24. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. 1988. Servqual: A multiple-item scale for measuring consumer perc. *Journal of retailing*, 64(1), 12.
25. Payne, A., Frow, P., 2005. A Strategic Framework for Customer Relationship Management. *Journal of Marketing*, 69, pp. 167-176. http://dx.doi.org/10.1509/jmkg.2005.69.4.167.
26. Pine II, J. & Gilmore, J. 1998. Welcome to the Experience Economy. Harvard Business Review, 76 (4), pp. 97-105.
27. Rosenbaum, M. S., Otalora, M. L., & Ramírez, G. C. J. B. H., 2017. How to create a realistic customer journey map. 60(1), pp.143-150.
28. Rust, R. T., & Zeithaml, V. A. V. & Lemon, K., 2000. Driving customer equity: How customer lifetime value is reshaping corporate strategy.
29. Satisfaction after Service Failure and Recovery. *Journal of Service Research*, *3*(2), pp. 121-137.
30. Shankar, V., Inman, J. J., Mantrala, M., Kelley, E., Rizley, R., 2011. Innovations in Shopper Marketing: Current Insights and Future Research Issues, *Journal of Retailing*, 87(1), pp.S29-S42,
31. Sheth, J. N. 1970. Book Review: Purchasing Behavior and Personal Attributes. *Journal of Marketing Research*, 7(3), pp. 403-404.

32. Sheth, J.N., Parvatiyar, A.,1995. Relationship marketing in consumer markets: Antecedents and consequences. JAMS 23, pp. 255–271. https://doi.org/10.1177/009207039502300405.
33. Singh, A., Dhayal, N., Shamim. A., 2014. Consumer Buying Behaviour. *International Research Journal of Management Sociology & Humanity* (IRJMSH) 5 (12), pp. 17-21.
34. Terragni, A., Hassani, M., 2018. Analyzing Customer Journey with Process Mining: From Discovery to Recommendations, *IEEE 6th International Conference on Future Internet of Things and Cloud (FiCloud)*, pp. 224-229.
35. Vakulenko, Y., Shams, P., Hellström, D., & Hjort, K. J. J. o. B. R., 2019. Service innovation in e-commerce last mile delivery: Mapping the e-customer journey. 101, pp. 461-468.
36. Vivek, S.D., Beatty, S.E., Morgan, R.M., 2012. Customer engagement: exploring customer relationships beyond purchase. *J. Mark. Theory Pract*. 20 (2), pp. 122–146.
37. Webster Jr, F.E., Wind, Y., 1972. *A general model for understanding organizational buying behavior*. J. Mark., pp.12–19.

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DOUBLE-EDGED SWORD OF THE ECONOMIC SANCTIONS HARMS THE REGIONAL ECONOMIC CONNECTIVITY AND GLOBALIZATION AND DISTURBS THE INTERNATIONAL ECONOMIC RELATIONS

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Abstract: The country that imposes sanctions and the sanctioned country both face significant economic losses in miscellaneous sectors of the economy, employment shrinkages, and in many cases create obstacles for projects of an economic nature. Economic sanctions make it difficult to achieve the United Nations sustainable development goals.

Pakistan cannot start construction work on the 56-inch diameter Iran-Pakistan gas pipeline because of United States sanctions fear. The result will be the 18 billion dollar penalty, which will seek Iran from Pakistan in the future if Pakistan fails to complete the project. Forty percent of Pakistani people are living below the poverty line. The imported pipeline gas is the cheapest option for poor Pakistanis than an imported liquefied natural gas pipeline. No United Nations member state has the right to impose economic sanctions on other United Nations member states as per the United Nations Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of Their Independence and Sovereignty.

The Republic of Moldova joined the Vertical Natural Gas Corridor. Diversification of gas supply sources is a good approach from Moldova's energy security point of view. The natural gas received from the Vertical Natural Gas Corridor will be the combination of costly liquefied natural gas and cheap Azeri Trans-Adriatic Gas Pipeline. A Russian pipeline gas through the territory of Ukraine is another dimension of energy security, and the government of Moldova needs to benefit from this opportunity. The Iasi-Ungheni pipeline from Romania to Moldova is the third source of gas supply diversification.

Regional economic interdependence and globalization are the key instruments for economic growth. Economic sanctions harm the economies of not only the sanctioned country but the economies of multiple other countries. Sanctions on Belarusian potash negatively impact the food security of the world. It increases fertilizer prices and food prices. The economies of Belarus and Lithuania are not only suffering but also multiple other nations of the world are caused harm by this sanction.

Keywords: economic sanctions, Iran-Pakistan gas pipeline, United Nation's Declaration, vertical natural gas corridor, Moldova's energy security, globalization
JEL Classification: F51, F02, F6

Introduction

The world's population is 8.2 billion. Resource sharing, regional economic connectivity, regional economic interdependence, and globalization are the key instruments to achieve the United Nation's sustainable development goals, eradicate poverty, reduce hunger, and generate employment opportunities.

Economic sanctions are called a double-edged sword because it harms the economies of both target and sender countries, and it also affect multiple other nations of the world. The United Nations Security Council has the basic responsibility for maintaining peace and responsibility worldwide as per the United Nations Charter. Sanction can be classified into three categories.
Type of sanctions: Arms sanctions, travel restrictions, financial sanctions, trade sanctions, arms sanctions, economic sanctions, etc.
Objectives of the sanctions: Destabilize regime in any country, democracy, territorial conflict, prevent war or end war, terrorism, human rights, political objectives, and other miscellaneous objectives.
The success of Sanctions: Settlement by negotiations, Partial or full success/achievement, failure, etc.
Sanctions are failed and ineffective because of globalization. Russian Federation is bypassing more than 21,000 miscellaneous sanctions, and it has high-income economy as per the World Bank.

Pakistan's pipeline projects and regional economic connectivity

The energy requirements of Pakistan are increasing day by day. Pakistan is working on miscellaneous gas import projects. These are three gas import pipeline projects, but Pakistan's Ministry of Energy (Petroleum Division) has failed to execute these important projects of a purely economic nature.

- Turkmenistan–Afghanistan–Pakistan Pipeline Project. It is 1,814 kilometers long pipeline, and the pipeline diameter is 56 inches.
- Iran-Pakistan gas pipeline project. The pipeline length is 2,775-kilometre, and the pipeline diameter is 56 inches. Iran already layed the gas pipe to the border of Pakistan.
- Pakistan Stream Gas Pipeline Project (formerly known as the North-South gas pipeline). It is a 1,100-kilometer-long pipeline. The operator and contractor will be the Russian Federation company Gazprom. It will transport Russian Liquefied Natural Gas (LNG) from Pakistan's port city of Karachi to Pakistan's city of Kasur in Punjab Province.

Pakistani Engineer Kamran Khan proposed two crude oil (including heavy oil) pipeline routes in Russian Federation's Ukhta State Technical University in an international conference in November 2023.

Pipeline Route No.1: A large diameter pipeline for transporting crude oil through the Russian part of the Caspian Sea, Turkmenistan, Afghanistan, and Pakistan.

Pipeline Route No.2: A crude oil pipeline from Russia through Kazakhstan, Uzbekistan, Afghanistan, and Pakistan.

In the future SAARC (South Asian Association for Regional Cooperation) countries will also be able to join this pipeline. SAARC has a population of over 1.7 billion people and a much bigger market than the European Union.
Russian Federation ranks first, and Iran ranks second in natural gas reserves in the world. Iran is already supplying a 2,577-kilometer-long natural gas pipeline from Iran's city of Tabriz to Türkiye city of Ankara. Iran is also pumping natural gas to the landlocked country of Armenia through the 140-kilometer-long pipeline.

In the case of Pakistan, the United States needs to consider that Pakistan is a lower middle-income country and its industry and agriculture is declining because of natural gas shortages. In addition, the common people of Pakistan are suffering because of gas load-shedding and high gas prices. Pakistan's Ministry of Energy (Petroleum Division) is in a very difficult situation. If Pakistan cannot execute the Iran-Pakistan gas pipeline project, Iran has the right to impose a penalty of 18 billion dollars as per the contract. If Pakistan executes the project, there is continuous fear of United States sanctions, and this is the other dimension.

Pakistan strongly believes in regional economic connectivity and globalization. In addition, Pakistan is enjoying good relations with Iran, the Russian Federation, other regional countries, and the United States.

Moldova's pipeline projects and regional economic connectivity

Moldova is working on a good energy security strategy and regional economic connectivity plans. There are three energy source diversification projects.

- Iasi-Ungheni pipeline from Romania to Moldova. This pipeline is operational.
- A Russian pipeline gas through the territory of Ukraine to Moldova is another dimension of energy security.
- Vertical Natural gas corridor. This pipeline project connects the economies of regional countries of Greece, Bulgaria, Romania, Hungary, Slovakia, and Ukraine with Moldova. It involves the Transmission System Operators (TSO) of seven countries.

Russian Federation's offshore gas pipelines to Germany and economic interdependence

Mentioned below two pipelines were constructed to transport cheap offshore pipeline gas from the Russian Federation to Germany.

- Nord Stream 1 pipeline. It is 1,222 kilometers long pipeline and has a diameter of 48 inches.
- Nord Stream 2 pipeline. It is 1,234 kilometers long pipeline and has a diameter of 48 inches.

Both gas pipelines are run under the Baltic Sea from the Russian Federation to Germany. Pipeline gas is always cheaper than liquified natural gas (LNG).

Despite United States sanctions and continuous opposition, both Germany and the Russian Federation completed the construction of Nord Stream 2 in September 2021. Presently both the offshore gas pipelines are not operational. United States is the dominant liquified natural gas (LNG) supplier in Germany. Why the Russian Federation's gas is low cost for Germany and other regional European countries?

First reason: Both onshore and offshore pipeline distances are not very far from the Russian Federation to European Union countries including Germany. The shipping distance of the United States and other suppliers (excluding Norway) to Germany is far as compared to the shipping distance of the Russian Federation to Germany.

Second reason: Pipeline gas has always low cost as compared to liquified natural gas (LNG). Germany or other European Union countries can switch to liquified natural gas (LNG) as a second option to the Russian Federation, Norway or Azerbaijan. Russian Federation gas transmission pipeline infrastructure is already available in European countries. European countries need to benefit their economy from low-cost Russian gas.

Regional economic interdependence is necessary for the sustainable development of the European Union and the rest of the world. Russian Federation and Iran strongly believe in natural resource sharing with regional countries and interdependence in the global economic system.

Sanctions on Belarusian potash and rest of the world

The sanctions on Belarusian potash fertilizers badly affect the economy of Lithuania (the sanctions sender country). While the Belarus (the sanctions target country) will build a multimodal port for its cargo in the Murmansk region of the Russian Federation to bypass sanctions. This is the way to bypass sanctions.

The South Asian Association for Regional Cooperation (SAARC) countries market is the biggest for Belarusian potash fertilizers as compared to the European Union. The population of SAARC countries is 1.93 billion while the population of the European Union is 448 million. Pakistan ranks fifth in the world in terms of population and more than 235.8 million people are living in Pakistan. That's why Engineer Kamran Khan proposed the construction of the "Potash Hub" in the Kech district (old name Turbat District) of Pakistan's Province of Balochistan at the international conference at Belarus State Economic University, Minsk in April 2024.

Belarus potash reserves rank second in the world and its global share is 22.73%. There are multiple negative effects on the global economy as the result of imposed sanctions on Belarus potash. These are given below.

- Infringement of human rights.
- Increase of potash prices in the world market.
- Disturb agriculture and increase hunger in many countries of the world.
- Threat to global food security.
- Threat to economic interdependence, regional economic connectivity, and globalization.
- Threat to United Nation's sustainable development goal No.1 (no poverty).
- Threat to United Nation's sustainable development goal No.2 (Zero hunger).
- Threat to United Nation's sustainable development goal No.3 (Good health and well-being).
- Threat to Belarusian's natural resource-sharing commitments to other nations of the world.
- Lithuanian port of Klaipėda on the Baltic Sea is experiencing cargo drop and economic difficulties.

Conclusions

(i) More than 1.5 million Ukrainian citizens entered Moldova because of the Ukraine crisis, and 120,000 are residing there. The population of Moldovan is 2.5 million. Moldova is a small landlocked country and small economy. There is tremendous pressure on the economy of Moldova, because of the Ukrainian refugee influx. It is recommended that Moldova needs to avoid sanctions against the Russian Federation and Belarus. This is essential for its economy.

(ii) Pakistan needs to quickly start work on Iran-Pakistan gas pipeline project. Pakistan must prepare the detailed plan to counter the potential threat of United States sanctions on this economic project. Presently, the Russian Federation is the most sanctioned country in the world

after Iran. Pakistan can seek the help of Russian Federation which have extensive experience to counter the sanctions. In addition, Pakistan needs to engage the United States administration and brief the economic benefits of gas pipeline project to achieve the United Nation's sustainable development goals in Pakistan.

(iii) Germany and other European countries need to get benefit from its closest regional country Russian Federation in terms of low-cost pipeline gas and low-cost liquified natural gas. Sanctions politics will negatively affect the industry, agriculture, and people of small sovereign European countries. In addition, the Russian economy is also badly impacted.

(iv) If we study the scenario of landlocked Belarus and Lithuania, sanctions are targeting the other countries of the world. Lithuania must protect its economy and play its role in global food security and lift the sanctions on Belarus and the Russian Federation.

(v) Company Pakneftegaz provides consultancy services to bypass miscellaneous types of sanctions.

References

1. Kamran. K., Vladimirovna, B., & Evgenievna, Y. 2023. Ways to expand energy cooperation between the Russian Federation and Pakistan on Russian heavy oil, other types of crude oils and oil refining). Scientific and technical conference Problems of geology, development and exploitation of deposits, transportation and processing of hard-to-recover reserves of heavy oils, Ukhta State Technical University, Russian Federation. pp.112-113, https://www.ugtu.net/sites/default/files/Pages/file/sbornik_vvn-2023.pdf
2. Kamran, K., 2024. Sanctions against Belarusian potash industry and proposed role of Pakistan's Balochistan as a Belarusian potash hub. 2nd International Student Scientific Conference 'ECON-2024: World Economy and International Business', Belarus State Economic University, Minsk.
3. Christine, A., 2024. The Russia Sanctions: The Economic Response to Russia's Invasion of Ukraine. first ed. London: Cambridge University press.
4. Brendan. T.,2009. American Sanctions in the Asia-Pacific. first ed. United Kingdom: Routledge, Taylor & Francis Group.

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ROMANIAN ECONOMY – STRUCTURAL DEVELOPMENTS

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Abstract: Romanian economy has been the champion of the European economic convergence process over the past decades. The GDP/capita at PPS as percentage of the EU average increased from around 30% in 1995 to 79.3% in 2023, a level very close to Poland (79.7%), according to Eurostat estimates. This evolution was determined by the forces of the EU integration, including the massive capital inflows (FDIs, EU funds, remittances), and the human capital outflows. However, the economic growth and development model determined by the EU integration forces seems to come to the end, as pointed out by the recent macroeconomic developments. The annual growth pace of the Romanian economy significantly decelerated in 2023 (to 2.1%) and 2024 (to 0.7% in first half of the year), while the twin deficits persist at very high levels. This paper applies standard econometric tools and uses the International Monetary Fund database in order to assess the structural developments in Romania over the past decades and to identify the main challenges for the coming decade. According to the results, the Romanian economy is facing the risk of another severe adjustment in the coming quarters, due to the unsustainable pro-cyclical income policy, the low efficiency of the investments, and the upward trend of the public debt/GDP ratio (as the financing costs are higher than the the growth pace). Furthermore, Romania is confronted with the risk of initiating a divergence process from the EU average in the future, unless structural reforms are accelerated.
Keywords: Romanian economy, Hodrick-Prescott, structural reforms
JEL Classification: E60, F41, O10

Introduction

Romanian economy has been the champion of the EU economic convergence process over the past decades, as reflected by the significant increase of the GDP per capita at purchasing power standards, from around 30% of EU average in 1995 to almost 80% in 2023, according to Eurostat (2024).

This impressive performance was determined by the forces of the EU integration process, including the huge capital inflows, with spill-over impact in the economy.

For instance, Romania received over EUR 110bn in foreign direct investments, mainly in the manufacturing sector (which is today highly integrated with the European industry), as reflected by the statistics of the National Bank of Romania (NBR, 2023).

In fact, starting the 1990s the foreign companies discovered the potential to produce in Romania at lower prices and to sell on the international markets, but also the positive outlook for the growth and development paces in this country in the context of EU integration.

Furthermore, Romania received more than EUR 60bn in EU structural funds, according to Osservatorio Balcani e Caucaso (2024), which fuelled the investments in the critical infrastructure.

In this context, the marginal efficiency of capital grew by a cumulated pace of 3.2 percentage points in Romania during the period 2004 – 2023, a pace significantly higher compared to the dynamics in Bulgaria (2.7 percentage points), Hungary (1.9 percentage points), Czechia (1.7 percentage points), and EU (1.3 percentage points), according to AMECO (2024).

On top of these, there should also be mentioned the remittances, which supported the residential constructions and the retail sales in Romania – cumulated volume of over EUR 60bn since 2005, according to the statistics of the World Bank (World Bank, 2024, a).

On the flipside, the population of Romania declined by more than 4 million since 1989 (as reflected by the data of the National Institute of Statistics of Romania, NIS, 2024), as the positive economic developments over the past decades were not enough to fill the gaps with the EU Western economies in terms of living and working conditions.

Furthermore, 17 years after the entry into the European Union, Romania continues to present an underdeveloped infrastructure and a high level of the share of informal economy in GDP, high level of inequality among the regions, challenges in terms of qualified labour force, and the persistence of the twin deficits at very high levels, as pointed out by the International Financial Corporation (IFC, 2023) and the World Bank (World Bank, 2024, b).

For instance, in 1Q 2024 the budget deficit/GDP ratio stood at 7% in Romania, the highest level among the EU countries, and significantly above the EU average (3%), as reflected by the data released by Eurostat (2024).

Furthermore, the budget deficit/GDP ratio widened from 2.40% in the period January – July 2023 to 4.02% during January – July 2024, according to the statistics published by the Ministry of Finance (MF, 2024).

This evolution was determined by the pro-cyclical income policies implemented by the Administration in the context of the electoral year (in 2024 are scheduled general elections, presidential elections and euro-Parliament elections). For instance, the data of Ministry of Finance (MF, 2024) show the increase of the wages in the public sector by an annual pace of 23.9% in the period January-July 2024.

At the same time, the current account deficit widened by an annual pace of around 34% to EUR 12.2bn during the period January – June 2024, according to the National Bank of Romania (NBR, 2024).

In fact, Romania presented current account deficit for 35 years in a row and budget deficit for 33 years in a row in 2023, as reflected by the statistics of the International Monetary Fund (IMF, 2024), as can be noticed in Figure 1.

The bad tradition in terms of twin deficits in Romania is reflecting the discontinuity of the structural reforms, and the preference for the implementation of pro-cyclical fiscal and income policies over the past decades.

In this context, the annual growth pace has significantly decelerated in Romania in the recent quarters, to 2.1% in 2023 and 0.7% for the period January – June 2024 (according to Eurostat,

2024), an evolution that confirms the end of the growth and development model of the past decades (based on the forces of the EU integration).

This perspective is also supported by the fact that Romania continues to be at the end of the European Union top in terms of digitalisation, share of population with university studies, level of development of financial markets, quality of regulation, and allocation in terms of research and development.

This paper employs standard econometric tools and the database of the International Monetary Fund (annual data for the period 1996 – 2023) in order to estimate the dynamics of the potential output and to distinguish between the cyclical and the structural components of the budget deficit in Romania.

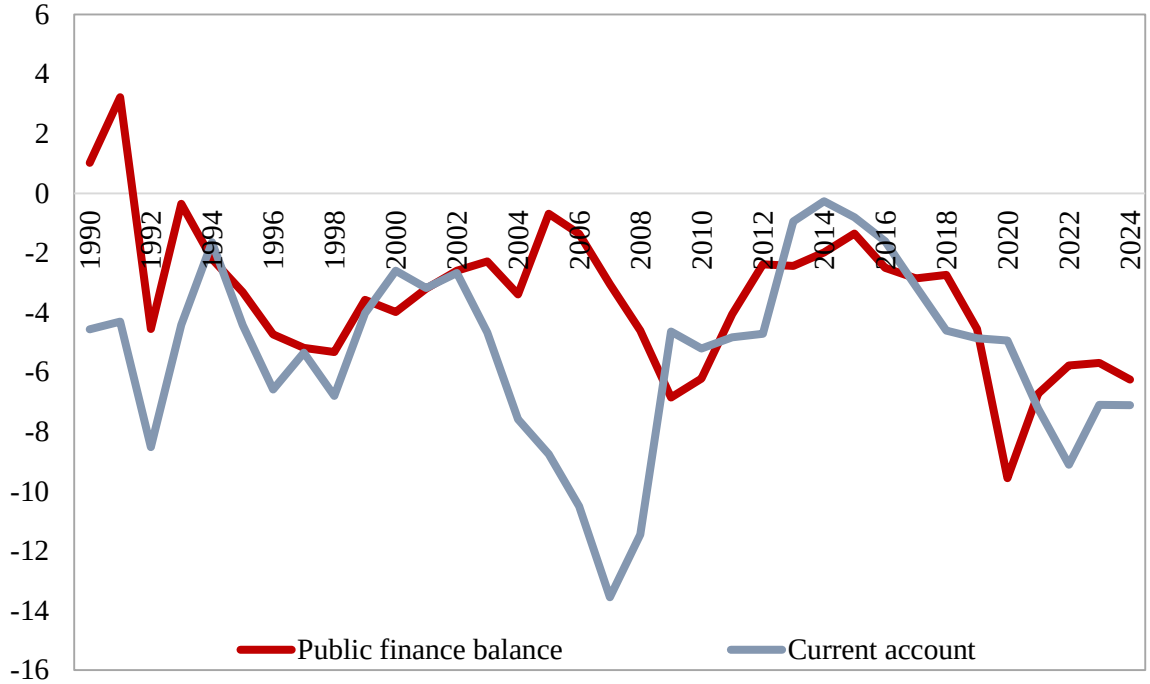

Figure 1. The budget deficit and the current account deficit in Romania (% of GDP)

Source: representation of the author using the database of the International Monetary Fund (2024)

The rest of the paper has the following structure: the next chapter briefly describes the methodology employed; the third chapter presents the main results of the econometric analysis; the conclusions are drawn in the last chapter of the article.

Methodology

This paper applies standard econometric tools in order to estimate the dynamics of the potential output, and the cyclical and structural components of the budget deficit in Romania, during the period 1996-2023, by using the database of the International Monetary Fund (IMF, 2024) and the econometric software E-Views.

On the one hand, the filter Hodrick-Prescott was applied in order to estimate the annual dynamics of the potential GDP and the output gap in Romania.

This is a widely used, simple and transparent method in the macro-econometric literature, being expressed by the following relation:

$$\textbf{Min}\sum_{t=1}^{T}(\ln Y_t - \ln Y_t^*)^2 + \lambda \sum_{t=2}^{T-1}((\ln Y_{t+1}^* - \ln Y_t^*) - (\ln Y_t^* - \ln Y_{t-1}^*))^2 \quad (1.1)$$

where Y_t, Y_t^* and λ represent the GDP, the potential output, and the smoothness parameter, with the following characteristic: the lower its value, the closer the GDP to the potential.
In this paper a value of 100 was considered for this parameter, as suggested by the paper of Hodrick-Prescott (1997), while working with annual database.
On the other hand, in order to distinguish between the cyclical and the structural components of the budget deficit in Romania, this paper considered the method of Balassone and Monacelli (2000).
The budget deficit can be expressed by the following relation:

$$def_t = def_s + def_c \quad (1.2)$$

in which def_t, def_s and def_c are the total budget deficit, the structural component, and the cyclical component (expressed as % of GDP).
As regards the cyclical component of the budget deficit, this is obtained by considering the output gap and the budgetary elasticity, as in the following relation:

$$def_c = (Y_t - Y_t^*) \text{ x } \eta \quad (1.3)$$

where $Y_t - Y_t^*$ is the output gap, while η represents the budgetary elasticity to GDP.
The output gap was estimated by applying the Hodrick-Prescott filter, while for the budget elasticity to GDP this paper considered the estimates of the European Commission for Romania (0.3), as in the paper of Larch and Turrini (2009).
The budgetary elasticity to GDP can be expressed in the following relation:

$$\eta = \frac{\Delta(def_t / Y_t)}{\Delta Y_t / Y_t} \quad (1.4)$$

which can be derived into the following relation:

$$\eta = \frac{R}{Y} x(\varepsilon_{R;Y_t} - 1) - \frac{X}{Y} x(\varepsilon_{X;Y_t} - 1) \quad (1.5)$$

where η is the budgetary elasticity to GDP, def_t represents the total budget deficit (as % of GDP), Y_t – the GDP, R – the budgetary revenues, X – the budgetary expenditure and $\varepsilon_{R;Y_t}$ - the elasticity of budgetary revenues to GDP, $\varepsilon_{X;Y_t}$ - the elasticity of budgetary expenditure to GDP.

Results

According to the results of the macro-econometric estimates the annual dynamics of the potential output in Romania presented significant fluctuations over the past decades, as reflected in Figure 2.

There can be noticed the upward trend during the period 1996 – 2006, the annual pace of the potential GDP accelerating from 0.2% to 4.6%, a record high level, an evolution determined by the reforms implemented in order to join the European Union.
However, the annual pace of the potential output deteriorated from 2007 to 2012 (to 2.8%, the lowest level since 1999), as the Great Financial Crisis severely hit the Romanian economy, which was in an overheating mood in 2007 and 2008, with a strong dependence on the international financing flows.

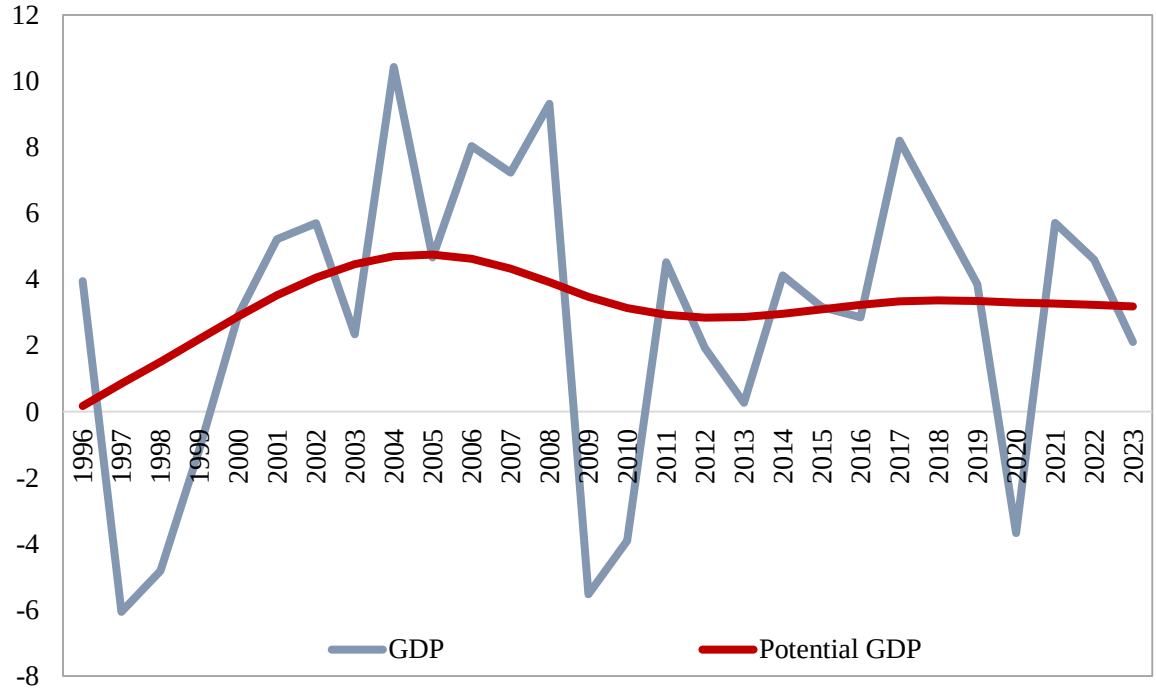

Figure 2. The annual dynamics of GDP and potential GDP (%)

Source: representation of the author based on the econometric estimates, employing the methodology described in the previous chapter and using the database of the International Monetary Fund (2024)

The annual pace of the potential output in Romania initiated another upward trend in 2013 (until 2018, to 3.4%, the highest level since 2009), as the economy entered the post-crisis economic cycle, and also gathered the fruits of the important structural reforms implemented under the international financing agreement (with International Monetary Fund, World Bank, and the European Commission).
On the other hand, the implementation of the pro-cyclical fiscal policies (more pronounced in 2019) and the outbreak of the COVID-19 pandemic (the worst health crisis in the world in more than one century) had a negative impact for the annual dynamics of the potential GDP in Romania, this indicator deteriorating to 3.2% in 2023, the lowest level since 2015.
Taking into account the slowing-down of the annual growth pace of the economic activity in Romania over the past quarters (to 2.1% in 2023 and 0.7% in first half of 2024, according to the data released by the National Institute of Statistics, 2024), the probability is very high for the annual dynamics of the potential output to deteriorate in the coming years, a scenario also supported by several factors:

1. the accumulation of risk factors in the direction of the outbreak of another world financial crisis (with the starting point in the public finance);
2. the high level of the budget deficit (and of the structural component of the deficit), also determined by the pro-cyclical income policies implemented in the electoral context of 2024;
3. the structural weaknesses in the domestic economy, including the low level of allocation for research and development and the low level of the digitalisation.

In terms of the public finance, the results of the macro-econometric estimates point out the high level of the structural budget deficit over the past decades in Romania, determined by the discontinuity of the structural reforms, and the implementation of the pro-cyclical fiscal and income policies.

Furthermore, there can be noticed the fact that the periods of the adjustment of the structural budget deficit in Romania were longer than the periods of widening this component of the budget deficit.

For instance, the structural component of the budget deficit adjusted from 5.9% of GDP in 1996 to 0.7% of GDP in 2005, a record low level, according to the estimates, represented in Figure 3.

In other words, it took 9 years to adjust the public finance in Romania, a process significantly influenced during that period by the implementation of structural reforms in order to prepare for the European Union.

Once the entry into the European Union was decided (Romania signed the EU Accession Treaty in the spring of 2005 in Luxembourg) pro-cyclical fiscal and income policies were implemented, which, in the context of the outbreak of the global financial crisis, determined the widening of the structural component of the budget deficit to 6.2% of GDP in 2008 (in three years).

The severe contraction of the economic activity and the lack of financing in the context of the global turmoil determined the Administration to ask for an international financing agreement in 2009.

The international financial institutions agreed a complex financing package for Romania, conditioned by the implementation of several structural reforms, including the measures to diminish the informal economy and to cut the public wages.

In this context, the structural component of the budget deficit adjusted gradually, in seven years, to 1.4% of GDP in 2015, the minimum since 2005, as can be noticed in the following chart (Figure 3).

After ending the international financing agreement, Romania embarked again on pro-cyclical fiscal and income policies in 2015 (including the significant decrease of the VAT and the increase of public wages), while slowing down the implementation of the structural reforms.

In this context, the structural component of the budget deficit widened again, to 2.4% of GDP in 2016, 4.3% of GDP in 2017, and 4.7% of GDP in 2019, the year before the outbreak of the coronavirus pandemic.

The public finances were severely hit by the outbreak of the COVID-19 pandemic, with the structural component of the budget deficit widening to 7.5% of GDP in 2020 and 2021, as reflected in Figure 3.

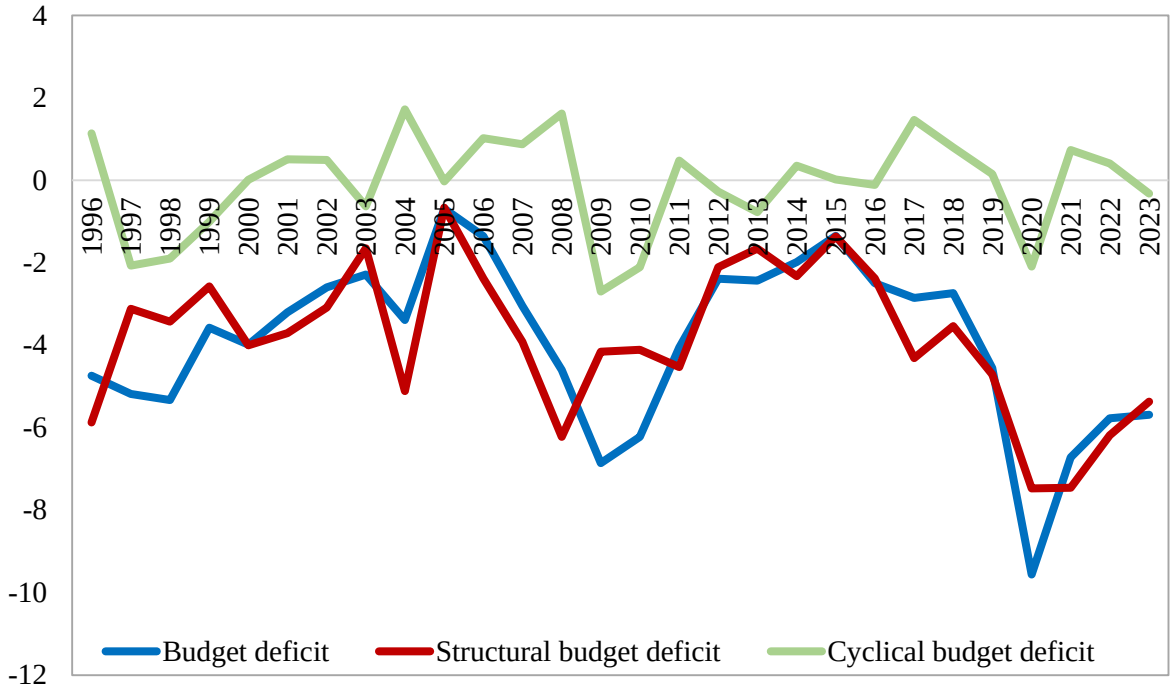

Figure 3. The structural and cyclical components of the budget deficit (% of GDP)
Source: representation of the author based on the econometric estimates, employing the methodology described in the previous chapter and using the database of the International Monetary Fund (2024)

According to these estimates, the structural component of the budget deficit stood at 5.4% of GDP in 2023.

We underline that the budget deficit in Romania persisted above 3% of GDP (the limit of the Stability and Growth Pact) since 2019, while the probability of widening in 2024 is very high, taking into account the significant slowing down of the pace of economic activity and the pro-cyclical income policy measures (including the increase of the public wages by an annual pace of over 23%, according to the statistics of the Ministry of Finance, 2024).

In other words, Romania is confronted again with the risks of a severe macro-economic adjustment, and very likely would have again to apply for an international financing agreement, especially taking account the high levels of the real interest rates in the mid-long run and the unsustainable upward trend for the public debt/GDP ratio (which is getting closer to 60%, the limit of the Treaty of Maastricht).

Conclusions

At present the economic activity is slowing-down (annual paces below potential), while the public finances are deteriorating in Romania.

These evolutions corroborated with the unprecedented tough international climate express the upward risk for the outbreak of another economic and financial crisis in Romania in the coming quarters.

Considering the past experience, the duration of the adjustment in terms of public finances (diminishing the structural component of the budget deficit as % of GDP) would be several years, as the manoeuvre room of economic policy is very low, the public debt/GDP ratio is very

high, and the stance of several indicators (including the reform of public administration, the degree of digitalization, and the allocation for research and development) is very weak.

The results of this research point out that the Administration should learn from the past, and implement balanced fiscal and income policies, in order to avoid high level of structural component of the budget deficit and to have manoeuvre room to intervene in the period of macroeconomic downturns.

Furthermore, nowadays is more important than ever to focus on adopting structural reforms on a continuous basis, as these allow the economy to increase its resilience in the context of the confrontation among the largest economic blocks in the world.

References

1. AMECO database (2024). AMECO database - European Commission (europa.eu)
2. Balassone, F. and Monacelli, D., 2000. EMU Fiscal Rules: Is there a Gap?. *Banca D'Italia Working Papers*, 375. Available at http://www.bancaditalia.it/pubblicazioni/econo/temidi/td00/td375_00/td375/tema_375it.pdf
3. International Financial Corporation (IFC) (2023). Country Private Sector Diagnostic: Romania (Executive Summary) (ifc.org)
4. International Monetary Fund (IMF) (2024). Select Country or Country Groups (imf.org)
5. Larch, M. and Turrini, A. (2009). The cyclically-adjusted budget balance in EU fiscal policy making: A love at first sight turned into a mature relationship. *European Commission, European Economy Economic Papers*, 374. Available at http://ec.europa.eu/economy_finance/publications/publication_summary14642_en.htm
6. Ministry of Finance (MF) (2024). Anexa2_bgc31072024 (gov.ro)
7. National Bank of Romania (NBR) (2023). Banca Naţională a României - Publicaţii periodice (bnro.ro)
8. National Bank of Romania (NBR) (2024). Banca Naţională a României - Balance of payments (bnr.ro)
9. National Institute of Statistics of Romania (NIS) (2024). TEMPO Online (insse.ro)
10. Osservatorio Balcani e Caucaso (2024). Banca Naţională a României - Publicaţii periodice (bnro.ro)
11. World Bank (WB) (2024, a). Personal remittances, received (current US$) | Data (worldbank.org)
12. World Bank (WB) (2024, b). Romania Overview: Development news, research, data | World Bank

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ENHANCING LEARNING AND RETENTION THROUGH GAMIFICATION

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Abstract: This study explores the role of gamification in enhancing learning and retention in high school Economics classes. A quasi-experimental design was employed to examine the effects of game-based learning on students' academic performance and knowledge retention, involving two comparable high school classrooms in Lezha, Albania. One class served as the control group and received teacher-led instruction, while the experimental group engaged in gamified learning sessions using Kahoot, a popular game-based learning platform. These sessions were conducted either at the beginning or the end of each lesson throughout the unit. The effectiveness of these approaches was assessed by comparing students' performance on a unit exam and a follow-up exam administered one month later.

Students' understanding of the material was assessed through an exam at the end of the unit, and the same exam was administered again one month later to evaluate retention. The results indicated that students in the gamified classroom significantly outperformed their peers in the control group on the immediate post-unit exam, demonstrating a deeper understanding of the content. Furthermore, the follow-up exam revealed a notable difference in knowledge retention, with the gamified group maintaining higher scores, particularly among students who initially exhibited lower performance.

These findings suggest that incorporating gamification into classroom instruction can be a powerful tool for enhancing student engagement, learning, and long-term retention. The positive effects were especially pronounced for students who typically struggle, indicating that game-based learning may help bridge achievement gaps by providing a more engaging and supportive learning environment. This study underscores the potential of integrating educational technology and gamification in social sciences education, emphasizing the importance of innovative teaching strategies in preparing students for the demands of the knowledge economy. The research highlights the need for further exploration of gamification's impact on diverse learning contexts, aiming to refine and optimize its application in educational settings.

Keywords: gamification, educational technology, high school economics, learning retention, game-based learning, Albania

1 Introduction

The increasing role of technology in education has led to the emergence of innovative teaching strategies aimed at improving student engagement and academic outcomes. Gamification, or the use of game design elements in non-game contexts, has become a popular approach in educational settings. This study investigates the effectiveness of gamification in high school Economics classes in Albania, with a focus on its impact on student learning and knowledge retention. The importance of Economics education in preparing students for active participation

in the knowledge economy makes it crucial to explore strategies that foster deeper understanding and long-term retention.

The quasi-experimental design of this research compares the learning outcomes of two groups: one that experienced gamified instruction via Kahoot and another that received traditional teacher-led instruction. The study aims to contribute to the growing body of literature on the potential of gamification as a pedagogical tool, particularly in the context of social sciences education.

1.1. Background on Gamification in Education

In recent years, the use of gamification in education has gained significant attention as a method for increasing student engagement and enhancing learning outcomes. Gamification involves incorporating game elements such as rewards, points, and competition into non-game contexts, including classroom instruction. Numerous studies have demonstrated that gamification can improve motivation, promote active learning, and create a more interactive educational environment. By transforming the traditional learning process into a dynamic experience, gamification provides opportunities for students to engage with content in a more meaningful way.

1.2. Importance of Engagement and Retention in Economics Education

Economics is a foundational subject in preparing students for participation in modern economies, equipping them with essential knowledge about market behavior, financial literacy, and decision-making. However, like many social sciences, Economics can be challenging for students due to its abstract concepts and theoretical nature. This makes it critical to explore teaching strategies that not only increase student engagement but also improve long-term retention of knowledge. Retention is key in ensuring that students can apply economic principles beyond the classroom, making them better prepared for real-world economic challenges.

1.3. Brief Overview of Kahoot as a Game-Based Learning Platform

Kahoot is a widely used educational technology platform that integrates gamification into the learning process through interactive quizzes and games. Its design allows for real-time feedback, promoting an engaging and competitive environment where students can actively participate in reviewing and applying course material. Kahoot's user-friendly interface, which includes leaderboards, timed responses, and multimedia support, makes it a popular tool in classrooms worldwide for reinforcing concepts while making learning fun. Given these features, Kahoot has been shown to enhance students' focus, engagement, and collaboration in a range of subjects, including social sciences like Economics.

1.4. Research Questions and Hypotheses

This study seeks to answer the following research questions:

1. How does gamified learning through Kahoot impact students' academic performance in high school Economics compared to traditional instruction?
2. What is the effect of game-based learning on knowledge retention, particularly for students who initially exhibit lower academic performance?
3. Can gamification bridge achievement gaps by providing an engaging and supportive learning environment for struggling students?

Based on these questions, the study proposes the following hypotheses:

- **H1**: Students in the gamified learning group will outperform their peers in the traditional instruction group on the immediate post-unit exam, demonstrating greater understanding of the material.
- **H2**: Students in the gamified learning group will exhibit higher knowledge retention on the follow-up exam compared to the control group, particularly among lower-performing students.
- **H3**: Gamification will help close the achievement gap by fostering better academic outcomes for students who typically struggle in traditional classroom settings.

2. Literature Review

2.1. Gamification in Education

Gamification has been widely recognized as a method to increase student motivation and engagement in learning environments. Deterding et al. (2011) define gamification as the use of game mechanics in non-game contexts to encourage participation. In the realm of education, gamification typically involves the incorporation of elements such as point systems, leaderboards, badges, and interactive quizzes. Previous research suggests that gamification can promote active learning by creating a competitive and interactive environment (Hamari, Koivisto, & Sarsa, 2014).

2.2. Previous Studies on Game-Based Learning in Social Sciences

The social sciences, including subjects like Economics, are inherently abstract, often requiring students to understand complex systems and theories. Prior research on game-based learning in the social sciences has revealed its potential to improve students' grasp of abstract concepts. A study by Sailer et al. (2017) found that gamification in social studies classrooms increased students' motivation and performance, as it encouraged active participation and critical thinking. Another study by Hung (2018) demonstrated that game-based learning platforms like Kahoot could improve knowledge retention in geography and history by offering engaging review sessions that reinforced students' understanding of key concepts.

In Economics education, traditional teaching methods are often lecture-based, leading to disengagement, especially among lower-performing students. However, research shows that gamified learning can enhance students' cognitive engagement by presenting material in an interactive and relatable manner. For example, Kiili et al. (2012) found that students who engaged in game-based simulations of economic principles showed improved problem-solving skills and a deeper understanding of market dynamics compared to those in traditional lecture settings.

Research by Plass, Homer, and Kinzer (2015) demonstrates that game-based learning supports knowledge retention by engaging students cognitively and emotionally. Games such as Kahoot provide immediate feedback, allowing students to reflect on their understanding and solidify knowledge. Additionally, studies indicate that students who struggle academically can particularly benefit from gamified learning environments, as they often find traditional pedagogies less engaging (Domínguez et al., 2013).

2.2. Challenges in Economics Education at the High School Level

High school Economics presents unique challenges, as students are often required to learn abstract theories without fully understanding their real-world applications. Key concepts such as supply and demand, market structures, and economic policy may be difficult for students to grasp, particularly if lessons are not made relevant to their experiences. Additionally, the abstract nature of Economics can lead to student disengagement, especially among those who struggle with math-related subjects.

Students with lower academic performance often find Economics intimidating, and traditional lecture-based methods may exacerbate this issue by providing few opportunities for interactive or differentiated instruction. This gap in understanding can lead to lower retention rates, as students fail to see the practical value of economic principles. As such, innovative pedagogical approaches, including gamification, are necessary to make the subject more accessible and engaging.

2.3. The Role of Technology in Enhancing Student Engagement and Retention

Technology has become an increasingly essential tool in modern education, offering new ways to engage students and support long-term retention of knowledge. Digital platforms, particularly those that incorporate gamification, provide interactive and adaptive learning experiences that cater to students' individual needs. Studies suggest that technology-based tools like Kahoot foster a dynamic learning environment, where immediate feedback and competition can enhance student motivation and understanding of complex content (Wang & Lieberoth, 2016).

Moreover, technology enables differentiated instruction, allowing teachers to tailor activities to meet diverse student needs. Research by Looyestyn et al. (2017) indicates that game-based learning environments increase student retention by keeping learners engaged with the content through repeated, meaningful interactions. The immediate feedback provided by such platforms helps students correct misunderstandings and retain information more effectively over time. The combination of visual stimuli, sound, and interactive gameplay captures students' attention, making technology a powerful tool for addressing the retention challenge in Economics education.

3. Methodology

3.1. Research Design

A quasi-experimental design was employed, involving two high school Economics classrooms in Lezha, Albania. The experimental group engaged in gamified learning sessions via Kahoot, while the control group received traditional teacher-led instruction. Both groups were comparable in terms of age, gender, and prior academic performance.

3.1.1. Rationale for Chosen Design

A quasi-experimental design was chosen for this study because it allows for the comparison of two groups under different instructional methods without the need for random assignment. This design is suitable for educational settings, where randomization is often impractical or unethical. By comparing the outcomes of two comparable classrooms in a real-world

educational context, this study can investigate the impact of gamified learning while maintaining a degree of ecological validity. The quasi-experimental design helps assess whether the intervention (gamified learning with Kahoot) produces significant differences in academic performance and retention, compared to traditional methods.

3.1.2. Limitations of the Design

One limitation of the quasi-experimental design is the lack of random assignment, which can introduce potential biases. Differences between the control and experimental groups may exist that are not solely attributable to the intervention. Additionally, since the study is conducted in a natural classroom setting, factors such as teacher effectiveness, student motivation, and classroom dynamics may influence the results. Although efforts are made to ensure that the two groups are comparable, these confounding variables can affect the internal validity of the study. Furthermore, the study's findings may not be generalizable beyond the specific context of the two high school classrooms in Lezha, Albania.

3.2. Participants and Setting

3.2.1. Description of the Two Classrooms in Lezha, Albania

The study was conducted in two high school Economics classrooms in Lezha, Albania. Both classrooms followed the same curriculum and were taught by the same teacher, ensuring consistency in the content delivered to both the control and experimental groups. The classes were selected based on their similar size and student academic backgrounds, making them ideal for comparison. These classrooms represented typical high school Economics classes in Albania, where traditional, lecture-based instruction is commonly used.

3.2.2. Demographic Information of Students

The study involved approximately 30 students in each classroom, with a roughly equal gender distribution. The students were between the ages of 16 and 18, and their prior academic performance in Economics was comparable, based on midterm grades. While specific demographic data such as socioeconomic background or ethnicity were not collected for this study, the students were typical of the broader school population in Lezha, a mid-sized town in northern Albania.

3.3. Procedure

The gamified lessons were delivered either at the beginning or the end of each lesson, incorporating multiple-choice questions related to the content covered in the unit. The control group followed the same curriculum without gamification. To measure academic performance, both groups took an exam at the end of the unit, and a follow-up exam was administered one month later to assess retention.

3.3.1. Control Group: Traditional Teacher-Led Instruction

The control group received traditional, teacher-led instruction throughout the unit on Economics. Lessons were delivered through lectures, textbook readings, and occasional class discussions. There was no incorporation of game-based learning elements or digital tools in this group. The control group followed the standard instructional model typically used in Albanian high school Economics classrooms.

3.3.2. Experimental Group: Gamified Learning with Kahoot

The experimental group received the same core content as the control group but with the addition of gamified learning sessions through Kahoot. These game-based quizzes were used to review key concepts and reinforce understanding at either the beginning or the end of each lesson. Kahoot allowed students to answer multiple-choice questions in real time, with immediate feedback provided through points and rankings, fostering a competitive and interactive environment.

3.3.3. Implementation Details

The intervention was implemented throughout the unit, which lasted four weeks. Gamified Kahoot sessions were conducted at the start or end of each lesson, lasting approximately 10-15 minutes per session. Each session consisted of 6-10 questions related to the day's lesson, designed to review and reinforce key concepts. Both groups received instruction for the same duration—45-minute lessons, once a week—with the only difference being the inclusion of Kahoot in the experimental group.

3.3. Data Collection and Analysis

Data on academic performance were collected through the unit exam and the follow-up retention exam. A mixed-methods approach was used to analyze quantitative data from the test scores and qualitative data from student feedback. A t-test was applied to compare the mean exam scores between the control and experimental groups, while retention was measured by the difference in scores between the post-unit and follow-up exams.

4. Results

4.1. Immediate Post-Unit Exam Performance

4.1.1. Comparison Between Control and Experimental Groups

The results of the immediate post-unit exam showed a significant difference in performance between the control group, which received traditional teacher-led instruction, and the experimental group, which participated in gamified learning through Kahoot. The experimental group demonstrated a higher mean score ($M = 78.4$, $SD = 9.2$) compared to the control group ($M = 71.3$, $SD = 10.1$). This suggests that the use of game-based learning led to a deeper understanding of the Economics content, reflected in better exam performance for the gamified group.

4.1.2. Statistical Analysis of Differences

A t-test was conducted to compare the post-unit exam scores of the two groups. The analysis revealed a statistically significant difference in performance, $t(58) = 3.12$, $p < 0.01$, indicating that the experimental group outperformed the control group with a high level of confidence. The results support the hypothesis that gamified instruction positively impacts students' immediate learning outcomes.

4.2. Knowledge Retention After One Month

4.2.1. Comparison of Follow-Up Exam Scores

To assess knowledge retention, the same exam was administered one month after the completion of the unit. Both groups experienced a decline in performance, but the experimental

group retained more knowledge compared to the control group. The average score for the experimental group was 72.6 (SD = 8.7), while the control group's average score dropped to 66.5 (SD = 9.8). The difference in retention rates between the two groups suggests that gamification not only enhances immediate learning but also contributes to better long-term retention.

4.2.2. Analysis of Retention Rates Between Groups

A repeated-measures ANOVA was performed to analyze the retention rates over time. The results showed a significant interaction effect between group (control vs. experimental) and time (immediate exam vs. one-month follow-up), $F(1, 58) = 4.89$, $p < 0.05$, indicating that the experimental group maintained their knowledge more effectively than the control group. This finding supports the second hypothesis that gamified learning leads to higher retention over time.

4.3. Impact on Lower-Performing Students

4.3.1. Subgroup Analysis of Initially Low-Performing Students

A subgroup analysis was conducted on students who performed in the lower quartile of the class on the initial exam. In the experimental group, lower-performing students showed a marked improvement in their post-unit exam scores compared to their counterparts in the control group. Specifically, the low-performing students in the gamified group improved their scores by an average of 10.2 points, whereas those in the control group only improved by an average of 5.7 points.

4.3.2. Comparison of Improvement Rates

A two-way ANOVA was conducted to examine the interaction between group (control vs. experimental) and performance level (low-performing vs. high-performing students). The analysis revealed a significant interaction effect, $F(1, 28) = 5.34$, $p < 0.05$, indicating that gamification had a greater positive impact on lower-performing students compared to those in the control group. This supports the third hypothesis that gamification can help close achievement gaps by providing a more supportive and engaging learning environment, particularly for students who struggle academically.

5. Discussion

5.1. The Effectiveness of Gamification on Learning

The findings support the hypothesis that gamification can enhance learning outcomes in high school Economics classes. The interactive and competitive elements of Kahoot seem to have positively influenced student engagement and comprehension. These results align with previous studies on the benefits of game-based learning in promoting active learning and higher-order thinking skills.

5.2. Gamification and Knowledge Retention

The results of the follow-up exam indicate that gamification not only improves immediate learning outcomes but also facilitates long-term retention, especially among lower-performing students. This suggests that gamified instruction provides a more supportive learning environment, helping to close achievement gaps.

6. Conclusion

This study demonstrates the potential of gamification as an effective pedagogical tool in high school Economics education. The use of game-based learning platforms like Kahoot can enhance student engagement, improve academic performance, and support knowledge retention. These findings have significant implications for educators seeking innovative methods to address diverse learning needs and prepare students for the knowledge economy. Future research should explore the application of gamification across different subjects and educational contexts to refine its use in classrooms.

References

1. Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* Springer Science & Business Media.
2. Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." Proceedings of the 15th International Academic MindTrek Conference.
3. Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., et al. (2013). Gamifying learning experiences: Practical implications and outcomes. Computers & Education, 63, 380-392.
4. Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. Proceedings of the 47th Hawaii International Conference on System Sciences.
5. Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education*, 80, 152-161. https://doi.org/10.1016/j.compedu.2014.08.019
6. Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2016). *NMC Horizon Report: 2016 Higher Education Edition*. The New Media Consortium.
7. Mayer, R. E. (2009). *Multimedia learning.* Cambridge University Press.
8. Martinho, T. D., & Oliveira, P. (2016). Gamification and political science teaching: Evaluation and results of a teaching experience. *European Political Science*, 15(4), 530-541. https://doi.org/10.1057/eps.2016.19
9. Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. Educational Psychologist, 50(4), 258-283.
10. Walstad, W. B., & Rebeck, K. (2001). Assessing the economic understanding of US high school students. *The American Economic Review*, 91(2), 452-457. https://doi.org/10.1257/aer.91.2.452
11. Wang, A. I. (2015). The wear out effect of a game-based student response system. *Computers & Education*, 82, 217-227. https://doi.org/10.1016/j.compedu.2014.11.004
12. Watts, M. (2005). What works: A review of research on outcomes and effective program delivery in precollege economic education. *The American Economic Review*, 95(2), 452-457. https://doi.org/10.1257/000282805774669508
13. Woltjer, G. (2018). Using game-based learning to teach Economics: A case study. *Journal of Economics Education*, 49(1), 34-45. https://doi.org/10.1080/00220485.2018.139567

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EXPLORING THE RELATIONSHIP BETWEEN POSITIVE YOUTH DEVELOPMENT COMPONENTS AND ANXIETY LEVELS AMONG ADOLESCENTS

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Abstract: This study explored the relationship between key components of Positive Youth Development (PYD) — Competence, Confidence, Social Connection, Character, and Care — and varying anxiety levels in adolescents. The objective was to identify how these components correlate with anxiety and highlight areas where interventions could be focused to support mental well-being. The study utilized descriptive and correlational analyses of data collected from a sample of adolescents (N=92). Five C of PYD components were measured alongside anxiety levels, which were categorized into minimal, mild, moderate, and severe. Descriptive statistics, such as means, medians, modes, and standard deviations, were calculated for each PYD component and anxiety category. Regression analysis was performed to examine the relationship between the PYD components and anxiety severity. The descriptive analysis showed that all PYD components had moderately high average values, with Competence (M=3.3, SD=0.7), Confidence (M=3.1, SD=0.8), and Social Connection (M=3.4, SD=0.6) being the most prominent. Regression analysis revealed significant negative correlations between higher levels of PYD components and lower levels of anxiety, especially in categories of moderate and severe anxiety. Competence,

Confidence, and Social Connection were the most predictive of lower anxiety levels, with stronger negative correlations observed in higher anxiety categories. For instance, Competence had a correlation of -0.45 for minimal anxiety and -0.60 for severe anxiety. The findings suggest that enhancing PYD components, particularly Competence, Confidence, and Social Connection, is associated with lower anxiety levels in adolescents. Interventions to foster these components may contribute to improved mental health outcomes, including reduced anxiety. The study underscores the importance of a holistic approach to youth development to promote both psychological well-being and social competence.
Keywords: 5 Cs. positive youth development, adolescents, anxiety, competence, confidence, connection, mental health
JEL Classification: I12, J13, O15

Introduction

Adolescence represents a crucial period of human development, marked by rapid physical, emotional, and social transformations that significantly shape an individual's psychological well-being (Backes & Bonnie, 2019; Christie & Viner, 2005; Žukauskienė, 2014). This phase is often characterized by heightened sensitivity to environmental and social pressures, which can make adolescents particularly vulnerable to mental health challenges (Orben, Tomova & Blakemore, 2020; Sahi, Eisenberger & Silvers, 2023). Among these, anxiety disorders emerge as some of the most prevalent and debilitating issues, capable of negatively impacting adolescents' academic performance, interpersonal relationships, and overall psychological adjustment (Beesdo, Knappe & Pine, 2009; Chiu, Falk & Walkup, 2016). Anxiety is a common psychological issue in adolescence, often manifesting through feelings of excessive worry, fear, and nervousness (Beesdo, Knappe & Pine, 2009). These symptoms can be further exacerbated by the multiple stressors adolescents face, such as academic pressure, peer relationships, and identity development (Mofatteh, 2020). High levels of anxiety in adolescents are associated with a range of negative outcomes, including lower academic achievement, social withdrawal, and impaired emotional regulation (Archbell & Coplan, 2022; Jiang *et al.*, 2022). Given the far-reaching implications of anxiety for adolescent development, there is a pressing need for strategies that can mitigate its impact and promote psychological resilience during this vulnerable period.

If left unaddressed, anxiety during adolescence may lead to long-term consequences that persist into adulthood, including increased risk of depression, substance abuse, and other mental health problems (Schlack *et al.*, 2021; Morales-Muñoz *et al.*, 2023). Thus, understanding both the risk and protective factors associated with anxiety during this formative period is essential for informing effective prevention and intervention strategies (Kozina et al., 2021).

One promising framework for addressing adolescent anxiety is the Positive Youth Development (PYD) model, which shifts the focus from problem behaviors to promoting positive attributes that foster healthy development (Zhou *et al.*, 2020). The PYD approach is grounded in the belief that all young people possess the potential to thrive, provided they are equipped with the right resources and support. Central to this model are the 5Cs: Competence, Confidence, Connection, Character, and Caring (Lin *et al*., 2018; Shek et al., 2019). These five core attributes represent developmental strengths that can enhance adolescents' resilience and protect against negative mental health outcomes, such as anxiety (Grazzani *et al.*, 2022).

The "Competence" dimension refers to adolescents' ability to effectively navigate academic, social, and physical challenges. Adolescents who feel competent in these areas are more likely to exhibit lower anxiety levels, as they are better equipped to cope with the demands of their environment. "Confidence", on the other hand, involves a positive sense of self-worth and belief in one's abilities. Adolescents with higher confidence are less likely to experience self-doubt and fear of failure, both of which are common contributors to anxiety. "Connection" emphasizes the importance of strong, supportive relationships with family, peers, and the broader community (Abdi *et al.,* 2023). Positive connections provide adolescents with emotional support, reducing feelings of isolation and anxiety. "Character" pertains to adherence to moral and ethical values, which can guide behavior and decision-making, fostering a sense of purpose and direction that counters feelings of anxiety (Black *et al.,* 2024; Yeager, Dahl & Dweck, 2018)). Lastly, "Caring" is characterized by empathy and concern for others, which can promote prosocial behaviors and emotional well-being, further protecting against anxiety (Alexander et al., 2021; Rodwin et al., 2022).

The 5Cs framework offers a holistic approach to adolescent development by focusing on internal assets that not only promote positive outcomes but also buffer against psychological distress. Numerous studies have demonstrated the protective role of the 5Cs in reducing risky behaviors and promoting mental well-being (Abdul Kadir & Mohd, 2021; Gomez-Baya *et al.,* 2023). For instance, research conducted by Manrique-Millones et al (2023) found that adolescents who exhibited higher levels of the 5Cs were less likely to engage in risky behaviors and more likely to report greater life satisfaction. Similarly, Kozina et al. (2021) showed that the 5Cs were negatively correlated with anxiety symptoms, suggesting that adolescents with stronger PYD attributes are less prone to experiencing anxiety. However, while these findings are well-established in Western contexts, the relationship between the 5Cs and anxiety in non-Western settings remains underexplored.

In non-Western societies, such as Albania, cultural, social, and economic factors may interact with the developmental processes (Hyseni Duraku et al., 2024) outlined by the PYD model in unique ways. Given the distinct cultural context of Albania, it is important to investigate whether the protective effects of the 5Cs extend to adolescents in this region. This study seeks to address this gap in the literature by examining the relationship between the 5Cs of Positive Youth Development and anxiety levels among adolescents in Tirana, Albania. By doing so, this study aims to provide insights into how developmental strengths can be leveraged to promote mental health in diverse cultural settings.

To assess anxiety, this study employs the Beck Anxiety Inventory (BAI), a well-validated instrument designed to measure the severity of anxiety symptoms. The BAI distinguishes between minimal, mild, moderate, and severe anxiety levels, offering a comprehensive understanding of the adolescents' emotional states. By combining the 5Cs Short Form, which measures the developmental strengths outlined by the PYD model, and the BAI, this study will explore the potential protective role of the 5Cs in mitigating anxiety symptoms among Albanian adolescents.

The primary aim of this study is to investigate the potential protective role of the 5Cs of Positive Youth Development—Competence, Confidence, Connection, Caring, and Character—in mitigating anxiety symptoms among adolescents in Tirana, Albania.

Hypotheses

1. There will be a negative correlation between Positive Youth Development (measured by the 5Cs) and anxiety levels (measured by the BAI) in adolescents.
2. Adolescents with higher scores in the 5Cs domains (Competence, Confidence, Connection, Caring, and Character) will exhibit lower levels of anxiety symptoms.

By exploring these relationships, this study seeks to contribute to the growing body of literature on Positive Youth Development, while also addressing the need for research on adolescent mental health in non-Western contexts. The findings from this study may offer valuable insights into how fostering developmental strengths can help reduce anxiety and promote well-being among adolescents, thereby informing interventions aimed at improving mental health outcomes in diverse cultural settings.

Method

This study employs a correlational quantitative methodology to evaluate the link between anxiety levels and the five characteristics of Positive Youth Development (PYD) among adolescents in Tirana, Albania. The study involved 92 youths from Tirana aged 15 to 18. Between April and June 2024, the sample was drawn using a convenience sampling method. Everyone agreed to take part in the study. They were in class when the survey was taken. The sample had 50 females and 42 males, with an average age of 17 years (SD = 0.95).

The 5Cs of Positive Youth Development

The 5Cs form (34 items) measure: Competence, by six items indexing academic, social, and physical competence. Confidence was measured by six items indexing self-worth, positive identity, and appearance. Connection was measured by eight items indexing positive bonds with family, neighborhood, school, and peer. Caring was measured by six items indexing sympathy and empathy. Character was measured using eight items indexing social conscience, valuing diversity, conduct morality, and personal values. The questionnaire is based on 5 points Likert - type scale rating from: (1) Strongly Disagree, (2) Disagree, (3) Neither Agree nor Disagree (4) Agree and (5) Strongly Agree. The Cronbach alpha has demonstrated acceptable psychometric properties for the total scale .89 and for the subscale - competence ($\alpha = 0.48$), confidence ($\alpha = 0.90$), character ($\alpha = 0.81$), caring ($\alpha = 0.96$), and connection ($\alpha = 0.63$).

The Beck Anxiety Inventory (BAI)

BDI was developed by Dr. Aaron T. Beck and colleagues in 1988, is a self-report questionnaire designed to assess the severity of anxiety symptoms. It consists of 21 items rated on a scale from 0 (not at all) to 3 (severe). BAI distinguishes between minimal, mild, moderate, and severe anxiety levels and focuses specifically on anxiety symptoms, minimizing overlap with depressive symptoms. This makes it valuable in clinical settings for differentiating anxiety from depression. It is reliable for various groups, including adolescents, and useful in both clinical practice and research. The BAI has shown strong internal consistency (Cronbach's alpha > 0.90) and good test-retest reliability (0.75–0.90).

Data analyses

The present study utilized SPSS 22 statistical software to analyze data collected from 92 high school students. The analytical approach focused on three main statistical methods: descriptive statistics was employed to summarize and describe the distribution of values within the sample. Measures such as means, standard deviations, and frequency distributions were calculated to provide a comprehensive overview of participants' demographic characteristics and their responses to the questionnaires. This initial analysis helped in identifying the general trends and distributions in the data.

Correlation analysis, was used to examine the strength and direction of relationships between key variables, particularly between the components of Positive Youth Development (PYD) and anxiety levels. This analysis aimed to identify significant correlations that could illuminate how various dimensions of the 5Cs of PYD relate to anxiety symptoms among the participants. Corresponding p-values were computed to assess the statistical significance of the correlations observed, allowing for a clearer understanding of these relationships.

Regression Analysis were applied to predict the influence of PYD components on varying levels of anxiety. This analysis aimed to explore how individual dimensions of PYD—namely Competence, Confidence, Connection, Caring, and Character—could serve as protective factors in mitigating anxiety symptoms among adolescents. By examining these relationships, the study sought to identify which specific components of PYD contribute most significantly to reducing anxiety.

Results

The descriptive statistics for the five dimensions of Positive Youth Development (PYD)—Competence, Confidence, Connection, Character, and Caring—derived from the responses of the adolescent participants reveals that adolescents perceive themselves relatively positively across the five dimensions of PYD, with "Caring" and "Connection" being the highest-rated constructs. However, the variability observed in the dimensions of Confidence and Character suggests that these areas may benefit from targeted interventions aimed at fostering self-esteem and character development. The relatively lower mean scores for confidence could be indicative of the challenges adolescents face in this area, warranting further investigation into potential influences on their self-perception. These findings underscore the importance of promoting all dimensions of PYD to enhance overall adolescent well-being and resilience.

The study analyzed the anxiety levels of participants, categorizing them as minimal, mild, moderate, and severe. The results showed a significant predominance of minimal to mild anxiety levels, with a significant drop in the reporting of moderate and severe anxiety symptoms. The higher mean and mode scores for minimal and mild anxiety suggest that while some participants experience anxiety, it is largely perceived as manageable and less impactful. The significant variability in minimal anxiety scores indicates that this category encompasses a wide range of experiences, while the lower prevalence of moderate and severe anxiety levels suggests that serious anxiety issues may not be as widespread among adolescent participants. These findings emphasize the importance of addressing and supporting adolescents experiencing varying levels of anxiety, particularly those in the minimal and mild categories,

as they may still benefit from interventions aimed at enhancing coping strategies and resilience. Further research is warranted to explore the underlying factors contributing to these anxiety levels and identify effective support mechanisms for this population.

The analysis of gender distribution (table 1) of the 5Cs of Positive Youth Development (PYD) components reveals that male students tend to have higher levels of confidence and connection, while females excel in caring and character. Both genders show equal competence levels. Female students report a higher percentage of caring, which aligns with common socialization patterns. Competence perceptions are evenly distributed between genders, suggesting similar opportunities or experiences contribute to self-assessment. Character perceptions are higher among female students, with 21.3% of them reporting character, reflecting their socialization towards virtues like integrity and responsibility. These findings can inform future interventions to enhance PYD in adolescents, recognizing strengths and areas for improvement across genders. Further research could explore underlying factors contributing to these differences, such as socialization processes, cultural influences, and educational environments.

Table 1. Gender Distribution of 5Cs of Positive Youth Development Among High School Students

	Female (%)	**Male (%)**
Confidence	20.8%	21.3%
Connection	18.8%	21.2%
Caring	19.7%	18.1%
Competence	19.2%	19.2%
Character	21.3%	20.2%

The data presented in the table 2 delineates the distribution of anxiety levels among high school students, segmented by gender. It reveals distinct patterns in the prevalence of anxiety across various severity categories.

Female students exhibit a slightly higher prevalence of minimal anxiety (30.1%) compared to male students (28.4%). This observation may suggest that female students perceive their anxiety as less pronounced or possess a greater resilience to minor stressors, although further investigation would be necessary to substantiate these findings.

The distribution indicates a relatively balanced representation, with 25.3% of female students and 26.1% of male students experiencing mild anxiety. This proximity in percentages suggests that both genders encounter similar minor anxiety-inducing situations, reflecting shared experiences in their educational environments.

The prevalence of moderate anxiety appears to be somewhat higher in male students (22.3%) than in female students (20.2%). This trend could imply that male students may experience increased stressors or challenges that contribute to moderate anxiety levels, warranting further investigation into the specific factors influencing these results.

The percentage of students experiencing severe anxiety is relatively comparable, with 24.4% of female students and 23.2% of male students. This indicates that both genders face significant anxiety challenges, necessitating attention from educators and mental health professionals to address these issues effectively.

Table 2. The distribution of anxiety levels among high school students

Anxiety levels	Students F (%)	Student M (%)
Minimal	30.1%	28.4%
Mild	25.3%	26.1%
Moderate	20.2%	22.3%
Severe	24.4%	23.2%

Overall, the analysis of anxiety levels among female and male high school students suggests nuanced differences in the prevalence of anxiety across categories. While females display a slight increase in minimal anxiety, males report higher moderate anxiety levels. These findings underscore the importance of tailored interventions to support both genders effectively in managing anxiety, particularly in educational settings. Future research should explore the underlying causes of these gender differences in anxiety prevalence to inform targeted support strategies.

The data presented in table 3 provides insights into the distribution of various components of 5Cs PYD across different age groups (15 to 18 years old). Each component is measured as a percentage of the total sample, reflecting the proportion of students in each age category who exhibit specific attributes associated with PYD.

The confidence levels exhibit a slight increase from age 15 (17.9%) to age 17 (20.0%) before decreasing slightly at age 18 (19.1%). This trend suggests that confidence may develop or fluctuate during adolescence, with a peak at age 17. It may indicate a critical period for confidence development, potentially linked to developmental milestones or psychosocial factors characteristic of this age.

The percentage of students demonstrating competence shows an increase from age 15 (17.9%) to age 16 (21.4%), followed by a stable level at ages 17 (20.0%) and 18 (19.1%). This finding indicates that the transition into age 16 may be a pivotal time for students to develop competence, possibly due to increased academic responsibilities or extracurricular activities.

Connection levels are relatively high among 15-year-olds (23.1%) and show a gradual decrease to 21.4% in 16-year-olds, further declining slightly to 20.0% in 17-year-olds and then stabilizing at 21.3% for 18-year-olds. This trend may reflect the evolving nature of peer relationships and social networks during adolescence, where initial connections might shift in intensity and quality as students navigate their social environments.

Similar to connection, the caring component shows a rise from age 15 (17.9%) to age 16 (21.4%), maintaining a steady level of 20.0% at age 17 and increasing slightly again to 21.3% at age 18. This pattern suggests that as adolescents mature, their capacity for caring may be enhanced, potentially influenced by increased social awareness and emotional development.

Character scores display a pattern of higher percentages at age 15 (23.1%) and a decrease at age 16 (19.0%), followed by a stabilization at 20.0% for age 17 and 19.1% at age 18. The decline at age 16 may indicate a period of identity exploration, where character traits are being challenged or reevaluated, which is common during adolescence.

Table 3. The distribution of the 5Cs of PYD across different age groups (15 to 18 years old)

Component	Age 15 years	Age 16 years	Age 17 years	Age 18 years
Confidece	17.9%	16.7%	20.0%	19.1%
Competence	17.9%	21.4%	20.0%	19.1%
Connection	23.1%	21.4%	20.0%	21.3%
Caring	17.9%	21.4%	20.0%	21.3%
Character	23.1%	19.0%	20.0%	19.1%

The analysis of the PYD components across different ages reveals dynamic trends that may be indicative of the developmental processes during adolescence. Notably, confidence and competence appear to peak at specific ages, while connection, caring, and character show fluctuations that reflect the complexities of social interactions and emotional growth. These findings emphasize the need for targeted interventions that nurture these components during critical developmental periods, helping adolescents enhance their overall positive development as they transition through high school. Further research is warranted to explore the underlying factors influencing these changes in PYD components across ages.

The analysis (not presented in the table) allows for the identification of trends in anxiety levels among adolescents, which can provide insights into their psychological well-being.

The highest percentage of adolescents (40%) reported a minimal level of anxiety, indicating a relatively low level of anxiety in this age group. However, 30% of participants reported moderate anxiety, which suggests that while many are experiencing minimal anxiety, a significant portion is experiencing moderate anxiety symptoms. The prevalence of severe anxiety symptoms is lower at 15%.

At age 16, the distribution changes, with 30.7% of students reporting minimal anxiety, a notable decrease from age 15. This decrease may suggest that as adolescents transition to age 16, they may face new social, academic, or personal challenges contributing to increased anxiety levels. Notably, the percentage of adolescents reporting severe anxiety rises to 30.7%, indicating a critical point where anxiety symptoms may become more pronounced during this transitional phase.

The anxiety levels for 17-year-olds show a different pattern, with the highest percentage of participants (45.8%) reporting minimal anxiety. This recovery in minimal anxiety levels could suggest that students at this age may have adapted better to their circumstances, perhaps due to developing coping mechanisms or social support networks. However, the rates of mild (16.6%) and moderate (16.6%) anxiety remain consistent but relatively low compared to the previous age group. The percentage of severe anxiety drops to 20.8%, indicating a reduction in the most extreme anxiety symptoms.

Among 18-year-olds, 40% reported minimal anxiety, reflecting stability from age 17. However, the mild and moderate levels of anxiety increase to 23.3%, suggesting that as students approach graduation, they may experience increased pressure related to future uncertainties and transitions into adulthood. Interestingly, the prevalence of severe anxiety symptoms declines to 13.3%, indicating that while many adolescents face mild to moderate anxiety, severe anxiety is less common in this age group.

The analysis reveals significant variations in anxiety levels among adolescents aged 15 to 18. The data suggest that while younger adolescents may experience relatively low levels of anxiety, there is a concerning rise in severe anxiety during the transition to age 16. However, many 17- and 18-year-olds exhibit adaptive characteristics, as evidenced by the increases in minimal anxiety and the decrease in severe anxiety levels. This information underscores the need for targeted interventions to support adolescents through critical transition periods and the importance of mental health resources in educational settings to promote overall psychological well-being. Further longitudinal studies could provide deeper insights into the developmental trajectories of anxiety in adolescents and inform effective strategies for prevention and intervention.

Table 4 presents the correlation coefficients between the five components of Positive Youth Development (PYD)—Competence, Confidence, Character, Caring, and Connection—and various levels of anxiety (Minimal, Mild, Moderate, and Severe). Correlation coefficients, ranging from -1 to 1, indicate the strength and direction of relationships between the variables. The correlation coefficients for competence are consistently low and negative across all anxiety levels, with values ranging from -0.10 to -0.15. These values suggest a weak negative correlation, indicating that higher levels of competence are associated with slightly lower levels of anxiety. However, the strength of this relationship is minimal and does not reach statistical significance (notably, none of the correlations are less than -0.30). This may imply that while competence may have some role in alleviating anxiety, it is not a primary factor.

Confidence shows a stronger negative correlation with anxiety levels compared to competence. The correlation coefficients range from -0.30 to -0.45, indicating a moderate negative relationship. As confidence increases, anxiety levels tend to decrease significantly, particularly at severe levels of anxiety. The more pronounced negative relationship highlights confidence as a crucial factor in influencing anxiety, suggesting that interventions aimed at enhancing adolescent confidence could be effective in mitigating anxiety symptoms. The significance levels (noted as $p < 0.05$) indicate that these findings are statistically significant.

Character demonstrates very weak negative correlations, ranging from -0.05 to -0.10, similar to competence. This indicates that character has little to no discernible impact on anxiety levels. This finding suggests that character may not be a significant protective factor against anxiety, or its influence is overshadowed by other components such as confidence and caring.

In contrast to the other components, caring exhibits positive correlations with anxiety levels, ranging from 0.30 to 0.35. This suggests that higher levels of caring are associated with higher anxiety levels. This finding may initially seem counterintuitive; however, it could indicate that individuals who exhibit higher levels of caring may be more sensitive to others' emotions and experiences, potentially leading to increased anxiety due to empathic responses or emotional burden. This relationship warrants further exploration to understand the dynamics of caring in relation to anxiety.

Connection presents moderate negative correlations with anxiety levels, with coefficients ranging from -0.25 to -0.40. Similar to confidence, this indicates that a stronger sense of connection is associated with lower levels of anxiety. The significant negative correlation at severe anxiety levels suggests that fostering social connections could be beneficial in reducing

anxiety among adolescents. This finding highlights the importance of social support and connectedness in promoting mental health.

Table 4. Correlation Coefficients between the 5Cs of PYD and Levels of Anxiety.

Anxiety Level	Minimal	Mild	Moderate	Severe
Competence	-0.10	-0.10	-0.15	-0.15
Confidence	-0.30	-0.35	-0.40	-0.45
Character	-0.05	-0.05	-0.10	-0.10
Caring	0.30	0.35	0.32	0.35
Connection	-0.25	-0.30	-0.35	-0.40

Note: *p < 0.05, **p < 0.01**

The correlation analysis highlights the nuanced relationships between the 5Cs of PYD and anxiety levels. Among the components, confidence emerges as a significant protective factor against anxiety, while caring shows a positive correlation with increased anxiety levels, necessitating a deeper examination of its implications. Competence and character appear to have minimal effects, suggesting that enhancing confidence and connection could be prioritized in interventions aimed at reducing anxiety in adolescents. Overall, these findings underline the importance of the 5Cs in understanding and addressing anxiety symptoms in youth, pointing toward specific areas for targeted psychological support and development programs.

The results of multiple regression analyses, presented in Table 5 assess how each of the 5Cs of Positive Youth Development (Competence, Confidence, Character, Caring, and Connection) predicts varying levels of anxiety (Minimal, Slight, Moderate, and Severe). The regression coefficients (B), standardized beta values (β), and t-values are shown for each predictor across the anxiety levels, along with R^2 values indicating the proportion of variance explained by the model.

1. Minimal Level of Anxiety

Competence shows a negative but weak relationship with minimal anxiety ($B = -0.220$, $\beta = -0.105$, $p < 0.01$), suggesting that higher competence slightly reduces anxiety. Confidence exhibits a stronger negative effect ($B = -0.310$, $\beta = -0.245$, $p < 0.001$), indicating a more substantial impact in reducing anxiety at this level. Character positively associated with minimal anxiety ($B = 0.150$, $\beta = 0.090$, $p < 0.05$), suggesting that a stronger sense of character may increase anxiety slightly. Caring has a strong positive association ($B = 0.320$, $\beta = 0.305$, $p < 0.001$), indicating that more caring individuals experience minimal anxiety, which may point to the emotional burdens of caring. Connection is negatively associated with anxiety ($B = -0.250$, $\beta = -0.180$, $p < 0.001$), implying that stronger social connections help reduce minimal anxiety. The model explains 31.2% of the variance in minimal anxiety ($R^2 = 0.312$).

2. Slight Level of Anxiety

Competence continues to show a weak negative relationship ($B = -0.190$, $\beta = -0.112$, $p < 0.05$), suggesting a small protective effect against slight anxiety.

Confidence maintains a significant negative association (B = -0.280, β = -0.225, p < 0.01), reinforcing its role as a protective factor. Caring remains positively related to slight anxiety (B = 0.350, β = 0.245, p < 0.001), indicating that caring individuals may experience higher slight anxiety levels. Connection also continues to reduce slight anxiety (B = -0.270, β = -0.190, p < 0.001). The model explains 33.4% of the variance ($R^2 = 0.334$).

3. Moderate Level of Anxiety

Confidence is still negatively associated with moderate anxiety (B = -0.260, β = -0.202, p < 0.01), though slightly weaker than at lower anxiety levels. Caring strongly predicts moderate anxiety (B = 0.370, β = 0.235, p < 0.001), maintaining its positive relationship with increasing anxiety levels. Connection retains its negative relationship with anxiety (B = -0.260, β = -0.175, p < 0.01). The model explains 34.7% of the variance ($R^2 = 0.347$).

4. Severe Level of Anxiety

Confidence shows a weaker yet significant negative relationship (B = -0.240, β = -0.185, p < 0.05), indicating that higher confidence still helps to reduce severe anxiety, albeit to a lesser extent. Caring continues to positively predict severe anxiety (B = 0.410, β = 0.255, p < 0.001), suggesting that high levels of caring may contribute to emotional burden at severe anxiety levels. Connection remains a protective factor (B = -0.230, β = -0.162, p < 0.05), reducing severe anxiety levels. The model explains 35.9% of the variance ($R^2 = 0.359$).

Table 5. Regression Analysis Results for the Relationship between the 5Cs of PYD and Anxiety Levels

Dependent Variable	Predictor	B (SE)	β	t	R^2	R^{2*}
Minimal level	Constant	12.123 (1.234)		9.825***		
	Competene	-0.220 (0.076)	-0.105	-2.894**		
	Confidence	-0.310 (0.085)	-0.245	-3.647***		
	Character	0.150 (0.068)	0.090	2.206*		
	Caring	0.320 (0.073)	0.305	4.384***		
	Connection	-0.250 (0.081)	-0.180	-3.086***		
					0.312	0.304
Slight level	Constant	18.764 (1.456)		12.886***		
	Competence	-0.190 (0.089)	-0.112	-2.135*		
	Confidence	-0.280 (0.096)	-0.225	-2.917**		
	Character	0.130 (0.075)	0.080	1.733		
	Kujdesi	0.350 (0.081)	0.245	4.321***		
	Connection	-0.270 (0.089)	-0.190	-3.034***		
					0.334	0.326
Moderate level	Constant	24.895 (1.567)		15.887***		
	Competence	-0.170 (0.098)	-0.109	-1.735		
	Confidence	-0.260 (0.108)	-0.202	-2.407**		
	Character	0.140 (0.082)	0.088	1.707		
	Caring	0.370 (0.090)	0.235	4.111***		
	Connection	-0.260 (0.095)	-0.175	-2.737**		

					0.347	0.339
Severe level	Constant	30.432 (1.789)		17.015***		
	Competence	-0.150 (0.112)	-0.085	-1.339		
	Confidence	-0.240 (0.123)	-0.185	-1.951*		
	Character	0.120 (0.093)	0.072	1.290		
	Caring	0.410 (0.103)	0.255	3.981***		
	Connection	-0.230 (0.108)	-0.162	-2.130*		
					0.359	0.351

The regression analyses highlight that "***confidence***" and "***connection***" are consistent protective factors against anxiety across all levels, with "***confidence***" having the most significant impact. In contrast, "***caring***" shows a positive correlation with anxiety, suggesting that those who exhibit higher levels of caring may experience more anxiety, possibly due to emotional overload or empathic stress. "***Character***" and **"*competence"*** play a relatively smaller role in predicting anxiety levels. The models explain between 31% and 36% of the variance in anxiety, suggesting that the 5Cs of PYD can moderately predict anxiety but that other factors are likely contributing to the remaining variance.

Discussion

The findings of this study contribute to the growing body of research on Positive Youth Development (PYD) and its relationship with adolescent anxiety. Several key trends from this research align with previous studies, while some unique insights suggest new avenues for exploration.

The negative correlation between confidence and anxiety, particularly at severe levels, aligns with the work of Henriksen et al. (2017) who found that higher levels of self-confidence were linked to lower levels of psychological distress among adolescents. Both studies highlight the protective role that confidence plays in buffering anxiety. The stronger negative correlations between confidence and severe anxiety in this study, with coefficients as high as -0.45, emphasize confidence as a critical factor in mental well-being, further corroborating findings by Li et al. (2023), who noted that interventions aimed at boosting self-efficacy significantly reduced anxiety in high-stress environments.

This study also confirms the broader notion from PYD literature that fostering confidence is central to youth development. Studies by Lerner et al. (2005) similarly emphasized confidence as one of the most essential Cs in reducing internalizing behaviors such as anxiety. The predictive power of confidence, shown by regression analyses explaining a substantial proportion of the variance in anxiety (e.g., $R^2 = 0.31$ to 0.36), supports the argument for targeted programs to build self-esteem and resilience.

Connection emerged as another significant protective factor against anxiety, particularly at moderate and severe anxiety levels, with correlation coefficients as high as -0.40. This is consistent with findings from Tang et al (2024), who reported that strong peer relationships and social connections can act as buffers against the effects of stress and anxiety. The importance of social networks, as underscored in this study, echoes previous research by Haufler et al.

(2022), which found that adolescents with stronger social support systems exhibited lower levels of anxiety and depressive symptoms. Both studies point to the necessity of interventions that foster connection and social belonging in school environments to reduce anxiety symptoms. Moreover, the significance of connection is reflected in the regression analysis, where it consistently emerged as a predictor of lower anxiety, reinforcing the conclusions of studies by Shang et al. (2023) that enhancing social ties can mitigate emotional distress among adolescents. As the findings show, a strong sense of social connectedness serves as a buffer against not only minimal but also more severe levels of anxiety.

Interestingly, this study reveals a positive correlation between caring and anxiety, with correlation coefficients ranging from 0.30 to 0.35. This finding contrasts with some previous studies that have associated caring behaviors with positive psychological outcomes. For instance, Eisenberg et al. (2010) argued that empathy and prosocial behavior typically lead to better emotional health. However, the positive relationship between caring and anxiety in this study might indicate that adolescents with higher levels of caring may experience empathic stress or emotional overload, a concept supported by more recent research from Wang et al. (2024), which suggests that high levels of empathy can sometimes contribute to emotional burden, leading to anxiety.

This nuanced understanding of caring suggests that while empathy and prosocial behaviors are generally beneficial, there can be unintended emotional costs, especially when adolescents internalize the stressors of others. It is possible that interventions aimed at managing emotional boundaries could help caring adolescents manage the emotional demands of empathy, as suggested by Luis et al. (2023).

The relatively weak negative correlations between competence and anxiety found in this study are consistent with findings from previous research that indicate competence is not always a direct buffer against anxiety (Fürtjes, et al., 2023). Although competence is typically linked to academic success and self-efficacy, it may play a smaller role in directly reducing anxiety compared to confidence and connection. This finding supports the argument by Manrique-Millones et al. (2023) that while competence is a key component of PYD, it might influence anxiety indirectly through other mechanisms, such as increased confidence or social connectedness.

Similarly, the weak negative correlations for character suggest that virtues like integrity and responsibility may not directly impact anxiety. Previous studies (Novak et al., 2023; Lerner et al., 2011) have noted that character traits are more closely associated with moral development and ethical behavior than with emotional well-being. However, the modest role of character in this study indicates that fostering moral virtues may still contribute to holistic youth development, even if its direct effects on anxiety are minimal.

The gender-specific findings in this study align with previous research indicating that male adolescents tend to exhibit higher confidence and connection, while females show greater strengths in caring and character. This is consistent with research by Tomé et al. (2020), which highlighted gendered patterns of self-perception and socialization that influence developmental outcomes. Furthermore, the observation that males experience higher moderate anxiety while

females report higher minimal anxiety aligns with studies like McLean and Anderson (2009), which reported similar gender differences in anxiety experiences.

The age-related trends in PYD components and anxiety levels are also supported by existing literature on adolescent development. For instance, the fluctuation in confidence and competence across ages mirrors findings from Pivec and Kozina, (2023), who noted that self-perception tends to shift during key developmental transitions in adolescence. Similarly, the peak in anxiety levels around age 16 aligns with the well-established notion that mid-adolescence represents a critical period for psychological challenges, as adolescents navigate increasing academic and social pressures

Conclusion

In summary, the findings of this study align with existing PYD research in emphasizing the protective role of confidence and connection in reducing anxiety among adolescents. However, the positive correlation between caring and anxiety introduces new considerations regarding the emotional costs of empathy, pointing toward the need for interventions that address emotional boundaries in caring individuals. Future research should continue to explore the complex interplay between the 5Cs of PYD and mental health outcomes, particularly considering gender and developmental differences that may influence these relationships.

References

1. Abdi, S., Akinsulure-Smith, A. M., Sarkadi, A., Fazel, M., Ellis, B. H., Gillespie, S., Juang, L. P., & Betancourt, T. S. (2023). Promoting positive development among refugee adolescents. *Journal of Refugee Studies*. https://doi.org/10.1111/jora.12890.
2. Abdul Kadir, N. B., & Mohd, R. H. (2021). The 5Cs of Positive Youth Development, Purpose in Life, Hope, and Well-Being Among Emerging Adults in Malaysia. *Frontiers in psychology*, *12*, 641876. https://doi.org/10.3389/fpsyg.2021.641876.
3. Alexander, R., Aragón, O. R., Bookwala, J., Cherbuin, N., Gatt, J. M., Kahrilas, I. J., Kästner, N., Lawrence, A., Lowe, L., Morrison, R. G., Mueller, S. C., Nusslock, R., Papadelis, C., Polnaszek, K. L., Richter, S. H., Silton, R. L., & Styliadis, C. (2021). The neuroscience of positive emotions and affect: Implications for cultivating happiness and well-being. Neuroscience & Biobehavioral Reviews, 121, 220–249. https://doi.org/10.1016/j.neubiorev.2020.12.002,
4. Archbell, K. A., & Coplan, R. J. (2022). Too Anxious to Talk: Social Anxiety, Academic Communication, and Students' Experiences in Higher Education. Journal of Emotional and Behavioral Disorders, 30(4), 273-286. https://doi.org/10.1177/10634266211060079.
5. Backes, E. P., & Bonnie, R. J. (2019, May 16). *Adolescent Development*. The Promise of Adolescence - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK545476/.
6. Beesdo, K., Knappe, S., & Pine, D. S. (2009). Anxiety and anxiety disorders in children and adolescents: developmental issues and implications for DSM-V. *The Psychiatric clinics of North America*, *32*(3), 483–524. https://doi.org/10.1016/j.psc.2009.06.002.
7. Black, M. H., Helander, J., Segers, J., Ingard, C., Bervoets, J., de Puget, V. G., & Bölte, S. (2024). Resilience in the face of neurodivergence: A scoping review of resilience and factors promoting positive outcomes. *Clinical Psychology Review*, 113, 102487. https://doi.org/10.1016/j.cpr.2024.102487.
8. Chiu, A., Falk, A., & Walkup, J. T. (2016). Anxiety Disorders Among Children and Adolescents. *Focus (American Psychiatric Publishing)*, *14*(1), 26–33. https://doi.org/10.1176/appi.focus.20150029.
9. Christie, D., & Viner, R. (2005). Adolescent development. *BMJ (Clinical research ed.)*, *330*(7486), 301–304. https://doi.org/10.1136/bmj.330.7486.301.

10. Eisenberg, N., Eggum, N. D., & Di Giunta, L. (2010). Empathy-related Responding: Associations with Prosocial Behavior, Aggression, and Intergroup Relations. *Social issues and policy review*, *4*(1), 143–180. https://doi.org/10.1111/j.1751-2409.2010.01020.x.
11. Fürtjes, S., Voss, C., Rückert, F., Peschel, S. K. V., Kische, H., Ollmann, T. M., Berwanger, J., & Beesdo-Baum, K. (2023). Self-efficacy, stress, and symptoms of depression and anxiety in adolescents: An epidemiological cohort study with ecological momentary assessment. *Journal of Mood & Anxiety Disorders*, 4, 100039. https://doi.org/10.1016/j.xjmad.2023.100039.
12. Gomez-Baya, D., Martin-Barrado, A. D., Muñoz-Parralo, M., Roh, M., Garcia-Moro, F. J., & Mendoza-Berjano, R. (2023). The 5Cs of positive youth development and risk behaviors in a sample of Spanish emerging adults: A partial mediation analysis of gender differences. *European Journal of Investigation in Health, Psychology and Education*, 13(11), 2410–2427. https://doi.org/10.3390/ejihpe13110170.
13. Grazzani, I., Agliati, A., Cavioni, V., Conte, E., Gandellini, S., Lupica Spagnolo, M., Ornaghi, V., Rossi, F. M., Cefai, C., Bartolo, P., Camilleri, L., & Oriordan, M. R. (2022). Adolescents' Resilience During COVID-19 Pandemic and Its Mediating Role in the Association Between SEL Skills and Mental Health. *Frontiers in psychology*, *13*, 801761. https://doi.org/10.3389/fpsyg.2022.801761.
14. Haufler, A., Ditzen, B., & Schüler, J. (2022). Social Support as a Stress Buffer or Stress Amplifier and the Moderating Role of Implicit Motives: Protocol for a Randomized Study. *JMIR research protocols*, *11*(8), e39509. https://doi.org/10.2196/39509.
15. Henriksen, I. O., Ranøyen, I., Indredavik, M. S., & Stenseng, F. (2017). The role of self-esteem in the development of psychiatric problems: a three-year prospective study in a clinical sample of adolescents. *Child and adolescent psychiatry and mental health*, *11*, 68. https://doi.org/10.1186/s13034-017-0207-y.
16. Hyseni Duraku, Z., Davis, H., Blakaj, A., Ahmedi Seferi, A., Mullaj, K., & Greiçevci, V. (2024). Mental health awareness, stigma, and help-seeking attitudes among Albanian university students in the Western Balkans: A qualitative study. *Frontiers in Public Health*, 12, Article 1434389. https://doi.org/10.3389/fpubh.2024.1434389.
17. Jiang, M. M., Gao, K., Wu, Z. Y., & Guo, P. P. (2022). The influence of academic pressure on adolescents' problem behavior: Chain mediating effects of self-control, parent-child conflict, and subjective well-being. *Frontiers in psychology*, *13*, 954330. https://doi.org/10.3389/fpsyg.2022.954330.
18. Kozina, A., Gomez-Baya, D., Gaspar de Matos, M., Tome, G., & Wiium, N. (2021). The Association Between the 5Cs and Anxiety-Insights From Three Countries: Portugal, Slovenia, and Spain. *Frontiers in psychology*, *12*, 668049. https://doi.org/10.3389/fpsyg.2021.668049.
19. Lerner, R. M., Lerner, J. V., Almerigi, J. B., Theokas, C., Phelps, E., Gestsdottir, S., Naudeau, S., Jelicic, H., Alberts, A., Ma, L., Smith, L. M., Bobek, D. L., Richman-Raphael, D., Simpson, I., Christiansen, E. D., & von Eye, A. (2005). Positive Youth Development, Participation in Community Youth Development Programs, and Community Contributions of Fifth-Grade Adolescents: Findings From the First Wave Of the 4-H Study of Positive Youth Development. The Journal of Early Adolescence, 25(1), 17-71. https://doi.org/10.1177/0272431604272461.
20. Lerner, R. M., Lerner, J. V., von Eye, A., Bowers, E. P., & Lewin-Bizan, S. (2011). Individual and contextual bases of thriving in adolescence: a view of the issues. *Journal of adolescence*, *34*(6), 1107–1114. https://doi.org/10.1016/j.adolescence.2011.08.001.
21. Li, W., Guo, Y., Lai, W., Wang, W., Li, X., Zhu, L., Shi, J., Guo, L., & Lu, C. (2023). Reciprocal relationships between self-esteem, coping styles, and anxiety symptoms among adolescents: between-person and within-person effects. *Child and adolescent psychiatry and mental health*, *17*(1), 21. https://doi.org/10.1186/s13034-023-00564-4.
22. Lin, J. L. L., Chan, M., Kwong, K., & Au, L. (2018). Promoting positive youth development for Asian American youth in a Teen Resource Center: Key components, outcomes, and lessons learned. *Children and Youth Services Review*, 91, 413–423. https://doi.org/10.1016/j.childyouth.2018.06.040.
23. Luis, E. O., Martínez, M., Akrivou, K., Scalzo, G., Aoiz, M., & Orón Semper, J. V. (2023). The role of empathy in shared intentionality: Contributions from Inter-Processual Self theory. *Frontiers in psychology*, *14*, 1079950. https://doi.org/10.3389/fpsyg.2023.1079950.

24. Manrique-Millones, D., Gómez-Baya, D., & Wiium, N. (2023). The Importance of the 5Cs of Positive Youth Development to Depressive Symptoms: A Cross-Sectional Study with University Students from Peru and Spain. *Behavioral sciences (Basel, Switzerland)*, *13*(3), 280. https://doi.org/10.3390/bs13030280.
25. Marín-Gutiérrez, M., Caqueo-Urízar, A., Castillo-Francino, J., & Escobar-Soler, C. (2024). The 5Cs of positive youth development: Their impact on symptoms of depression, anxiety, stress, and emotional distress in Chilean adolescents. *BMC Psychology*, 12(1), 372. https://doi.org/10.1186/s40359-024-01863-x.
26. McLean, C. P., & Anderson, E. R. (2009). Brave men and timid women? A review of the gender differences in fear and anxiety. *Clinical psychology review*, *29*(6), 496–505. https://doi.org/10.1016/j.cpr.2009.05.003.
27. McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *Journal of psychiatric research*, *45*(8), 1027–1035. https://doi.org/10.1016/j.jpsychires.2011.03.006.
28. Mofatteh M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. *AIMS public health*, *8*(1), 36–65. https://doi.org/10.3934/publichealth.2021004.
29. Morales-Muñoz, I., Mallikarjun, P. K., Chandan, J. S., Thayakaran, R., Upthegrove, R., & Marwaha, S. (2023). Impact of anxiety and depression across childhood and adolescence on adverse outcomes in young adulthood: a UK birth cohort study. *The British journal of psychiatry: the journal of mental science*, *222*(5), 212–220. https://doi.org/10.1192/bjp.2023.23.
30. National Academies of Sciences, Engineering, and Medicine. (2019). The promise of adolescence: Realizing opportunity for all youth. (E. P. Backes & R. J. Bonnie, Eds.). *National Academies Press*. https://doi.org/10.17226/25388.
31. Novak, M., Šutić, L., Gačal, H., Roviš, D., Mihić, J., & Maglica, T. (2023). Structural model of 5Cs of positive youth development in Croatia: relations with mental distress and mental well-being. *International Journal of Adolescence and Youth*, *28*(1). https://doi.org/10.1080/02673843.2023.2227253.
32. Orben, A., Tomova, L., & Blakemore, S. J. (2020). The effects of social deprivation on adolescent development and mental health. *The Lancet. Child & adolescent health*, *4*(8), 634–640. https://doi.org/10.1016/S2352-4642(20)30186-3.
33. Pivec, T., & Kozina, A. (2023). Anxiety and COVID-19 Anxiety in Positive Youth Development: A Latent Profile Analysis Study. *Journal of youth and adolescence*, *52*(11), 2328–2343. https://doi.org/10.1007/s10964-023-01829-z.
34. Rodwin, A. H., Shimizu, R., Travis, R., Jr, James, K. J., Banya, M., & Munson, M. R. (2022). A Systematic Review of Music-Based Interventions to Improve Treatment Engagement and Mental Health Outcomes for Adolescents and Young Adults. *Child & adolescent social work journal : C & A*, 1–30. Advance online publication. https://doi.org/10.1007/s10560-022-00893-x.
35. Sahi, R. S., Eisenberger, N. I., & Silvers, J. A. (2023). Peer facilitation of emotion regulation in adolescence. *Developmental Cognitive Neuroscience*, 62, 101262. https://doi.org/10.1016/j.dcn.2023.101262.
36. Schlack, R., Peerenboom, N., Neuperdt, L., Junker, S., & Beyer, A. K. (2021). The effects of mental health problems in childhood and adolescence in young adults: Results of the KiGGS cohort. *Journal of health monitoring*, *6*(4), 3–19. https://doi.org/10.25646/8863.
37. Shang, B., Chen, R., Luo, C., Lv, F., Wu, J., Shao, X., & Li, Q. (2023). The relationship between alexithymia, depression, anxiety, and stress in elderly with multiple chronic conditions in China: a network analysis. *Frontiers in psychiatry*, *14*, 1209936. https://doi.org/10.3389/fpsyt.2023.1209936.
38. Shek, D. T., Dou, D., Zhu, X., & Chai, W. (2019). Positive youth development: current perspectives. *Adolescent health, medicine and therapeutics*, *10*, 131–141. https://doi.org/10.2147/AHMT.S179946.
39. Tang, Y., Xu, M., Tan, Z., & Liu, Y. (2024). The impact of social network use on adolescent depression: The chain mediation between self-objectification and body satisfaction. *Frontiers in Psychology*, 15. https://doi.org/10.3389/fpsyg.2024.1347858.

40. Tomé, G., Gaspar de Matos, M., Reis, M., Ramiro, L., Coelhoso, F., Gómez-Baya, D., & Wiium, N. (2020). Positive Youth Development: The 5 C's effect in a School environment. *Erebea. Journal of Humanities and Social Sciences*, *10* . https://doi.org/10.33776/erebea.v10i0.4958.
41. Wang, J., Yang, Q., Yu, X., & Hu, L. (2024). Effects of Adolescent Empathy on Emotional Resilience: The Mediating Role of Depression and Self-Efficacy and the Moderating Effect of Social Activities. *Behavioral sciences (Basel, Switzerland)*, *14*(3), 228. https://doi.org/10.3390/bs14030228.
42. Yeager, D. S., Dahl, R. E., & Dweck, C. S. (2018). Why Interventions to Influence Adolescent Behavior Often Fail but Could Succeed. *Perspectives on psychological science : a journal of the Association for Psychological Science*, *13*(1), 101–122. https://doi.org/10.1177/1745691617722620.
43. Zhou, Z., Shek, D. T. L., Zhu, X., & Dou, D. (2020). Positive Youth Development and Adolescent Depression: A Longitudinal Study Based on Mainland Chinese High School Students. *International journal of environmental research and public health*, *17*(12), 4457. https://doi.org/10.3390/ijerph17124457.
44. Žukauskienė, R. (2014). Adolescence and well-being. In A. Ben-Arieh, F. Casas, I. Frønes, & J. Korbin (Eds.), *Handbook of child well-being* (pp. 1713–1738). Springer. https://doi.org/10.1007/978-90-481-9063-8_67.

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BASIC DIRECTIONS FOR THE USE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE TRANSPORTATION AND LOGISTICS SECTOR

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Abstract: The article investigates the issues of using artificial intelligence technologies in the field of transportation and logistics in order to find effective solutions for their implementation. Based on the available data in this area, the main directions of development of transportation and logistics based on artificial intelligence, their characteristics and examples of implementation of technological solutions are considered, the main effects from the application of AI solutions are given.

It is shown that AI technologies are used in key processes of passenger and cargo transportation, traffic flow and road infrastructure management, and customer interaction. The development of AI in the industry corresponds to the global dynamics of the world technological development of the industry - these are the technologies of autonomous movement that can completely change the whole face of both personal mobility and passenger and cargo transportation in all modes of transportation.

Research reveals that in the field of AI applications for transportation and logistics, solutions based on computer vision technology are developing to the greatest extent. This is explained by the industry specifics, characterized by a high demand for solutions aimed at road safety, support of road service activities, photo and video recording of violations, control of resource consumption, and monitoring of harmful emissions reduction. The demand for computer vision technologies is also expected to continue to grow due to the implementation of large-scale projects in the field of unmanned transportation.

In addition, the vector of transport and logistics industry development is aimed at the formation of "smart" transport infrastructure (seaports, air harbors, railway system, etc.), which are fully automated facilities based on AI, Internet of Things, big data, blockchain, and other technologies.

Based on the results of the study, it is concluded that the considered directions of using AI technologies in the transport and logistics sphere contribute to improving the efficiency, safety and sustainability of transportation systems.

Keywords: artificial intelligence, machine learning, technology, transportation, logistics
JEL Classification: O32, C45, L86, R41

1 Introduction

The relevance of the research is determined by the need to find effective solutions in the field of transportation and logistics based on artificial intelligence technologies in order to stimulate their use.

The development of the domestic economy is largely determined by the effective operation of the transportation and logistics sphere, which provides connectivity of economic entities within

the country and interaction with international partners. High-quality management of transportation and logistics processes can increase operational performance, reduce costs and improve the competitiveness of companies in the transportation industry. Modern challenges and reorientation of trade operations and passenger flows faced by transportation and logistics companies determine the need to develop effective solutions in the implementation of logistics operations. New trends in the industry related to the development of electric vehicles, the development of unmanned vehicles, multimodal, intermodal, transmodal transportation, robotization and the application of innovative technologies require a high level of data integration, the use of advanced information systems and technologies for processing large volumes of information. Digital transformation and accompanying artificial intelligence (hereinafter - AI) technologies are able to move the transportation industry and individual processes in companies to a qualitatively new technological level and a new stage of operational efficiency, to reduce transportation and logistics costs.

Artificial intelligence is a set of technological solutions that allows imitating human cognitive functions (including self-learning and search for solutions without a predetermined algorithm) and obtaining, when performing specific tasks, results comparable, at least, with the results of human intellectual activity (Pugacheva, 2023, p. 209).

The indicators of the global AI market volume for transportation and logistics and the growth of the global AI solutions market by 2030 are given in Figure 1 (Application of artificial intelligence in priority sectors of the economy, 2023).

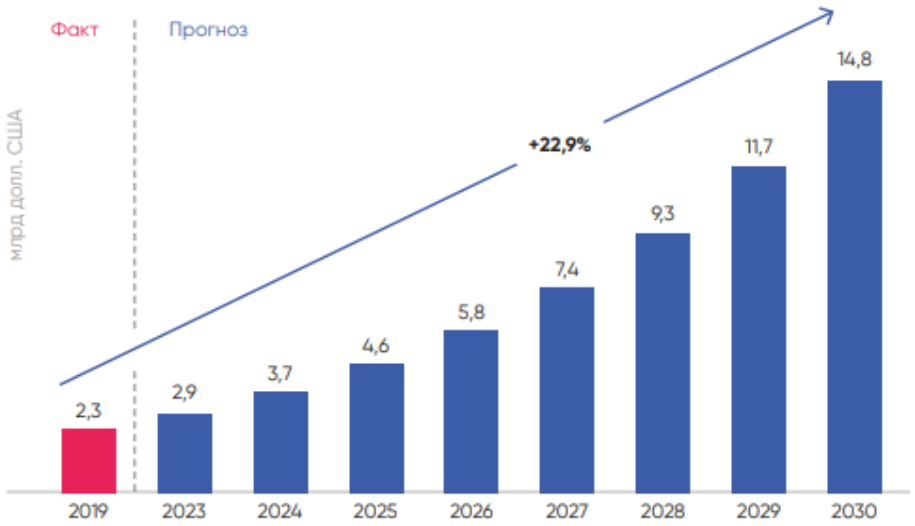

Figure 1 Global AI for transportation and logistics market size and growth figures for the global AI solutions market by 2030

Source: based on Interindustry Technology Transfer Center (2023)

2 The main directions of development of transportation and logistics based on AI technologies see the size of headings

Let us consider the main directions of development of the sphere of transportation and logistics, in which the application of AI technologies is of great importance.

The key directions of development of the sphere of transport and logistics on the basis of AI, their characteristics and examples of implementation of technological solutions are given in Table 1: what paragraph indentation (Artificial Intelligence in Transportation, 2024).

Table 1 Directions, characteristics and examples of implementation of AI-based technological solutions in the sphere of transportation and logistics

Characteristics	Examples
1 Development of autonomous transportation	
1.1 Autonomous transportation by passenger transport	
Advances in sensor, wireless communication, and machine learning technologies are enabling vehicles to more accurately recognize their environment and make complex decisions in real time. In autonomous vehicles, AI technologies are applied in perception, localization, decision making, feedback, and control of vehicle control. Autonomous mobility is predicted to improve safety and reduce accidents, fuel efficiency, productivity, and change the urban landscape. The large-scale deployment of autonomous vehicles raises a set of challenges, in the areas of cybersecurity, legal regulation (especially of cross-border transportation) and liability in case of accidents and incidents, as well as changing insurance models.	The Russian company Yandex has moved to the final stage of testing driverless unmanned cars with the potential for use in various areas: freight transportation, "last mile" (delivery of orders to the final customer), and cabs. Waymo (Alphabet) is developing and testing unmanned driving technologies in the US. In addition to Waymo, Tesla and a number of Chinese brands have their own autonomous cars.
1.2 Autonomous Freight Transportation	
In the transport and logistics industry, there is a trend towards the development of autonomous systems for freight transportation, capable of increasing the efficiency of logistics operations, reducing the cost of transportation by reducing labor costs and optimizing fuel costs. This is especially relevant in the context of the growing shortage of necessary personnel in the labor market and rising transportation costs. Autonomous transportation requires the realization of certain conditions: high-quality digital maps and geographic data, coverage of roads with high-speed communications, sensor systems and road safety infrastructure. The implementation of unmanned freight transportation differs from passenger autonomous mobility in terms of infrastructure requirements, the need for	In Russia, unmanned KAMAZ trucks were launched in 2023 to transport commercial cargo on the M-11 highway. The vehicles are equipped with communication, navigation, vision, and incoming information processing systems. TuSimple (USA) offers a solution of autonomous freight transportation network (AFN - Autonomous Freight Network). It has developed autonomous trucks based on an AI and sensor-based platform. Several trips without human presence or intervention have been realized in China and Japan. The trucks are capable of navigating urban and

dimensioning and payloads, control systems, safety and logistics management processes.	intercity roads in different weather conditions, taking into account the operation of traffic lights and lanes.
1.3 Autonomous delivery by robots and drones	
Robots equipped with AI systems and mobile platforms can deliver goods directly to the consumer's door, providing a more convenient service. The use of unmanned aerial vehicles (drones) to deliver goods is evolving, which is especially relevant in remote areas or in environments where traditional means of transportation have very low efficiency. The advantages of drones are: the ability to fly completely autonomously, avoiding obstacles; the availability of live video streaming; and real-time recording of drone location, status, altitude, and speed. Routing algorithms in AI-powered autonomous robots can improve routes based on various factors such as traffic, time of day, and customer preferences. Machine learning technologies provide more accurate prediction of delivery demand, which helps optimize inventory and lead times. Sensors and IoT devices can track and monitor transportation conditions such as temperature, humidity, and cargo condition. Retailers, postal services, and marketplaces are the most interested in these technologies.	In 2021, postal operator Russian Post launched a parcel delivery project using Yandex's unmanned robots in Moscow. In 2024, California-based Vayu Robotics unveiled its first robot courier. Robot One can follow store employees as they load customers' orders and then navigate city streets on its own to deliver goods. The robot is designed to drive on roads as well as bike paths, sidewalks and inside stores. An artificial intelligence model for autonomous robotics called Vayu Drive processes various types of data, such as images, text instructions and route data, and makes decisions about the robot's actions based on this information.
1.4 Unmanned specialized transport	
Autonomous Specialized Transport (AST) uses AI and automatic control technologies to perform tasks without human intervention. One of the main benefits of such transportation is increased efficiency and productivity. Autonomous vehicles can operate around the clock, allowing companies to reduce personnel costs and increase production. AST can be safer than traditional modes of transportation. It is equipped with advanced safety systems that avoid human error. The large number of sources of analyzed information allows for better operations than manual operator control, such as more efficient harvesting or warehousing of finished products.	Russian company Cognitive Robotics develops autonomous control systems for special vehicles for agriculture - Cognitive Agro Pilot. The technology is capable of autonomously performing a wide range of agricultural operations: tillage, cultivation, sowing, spraying, fertilizing, harvesting grass, tilled crops, while ensuring high accuracy of trajectory following and safety.

2 Using AI for customer interaction	
One way to realize this trend is through the use of chatbots. Chatbots can be useful for automating communication with customers, for example, to provide information on the status of a shipment delivery or vehicle tickets. Another way AI is being used in the transportation and logistics industry is to process data using optical character recognition and natural language processing. Optical character recognition can be used to recognize text on documents, such as invoices or bills of lading. This can help companies speed up document processing and improve data accuracy.	The Russian airline S7 uses a chatbot that allows to purchase, exchange, and surrender a flight ticket, clarify the status and schedule, and get advice on transportation rules. The implementation of the solution has reduced contact center support costs by 35%. About 70% of customer requests are processed automatically.
3 Technologies for integrating vehicles and infrastructure into a single loop of dynamic information exchange	
Development of connected car technologies (V2V, V2X, V2I)	
Connected Car technologies enable interoperability between different vehicles (V2V - Vehicle-to-Vehicle), vehicles and infrastructure (V2I - Vehicle-to-Infrastructure), and the overall technological environment around transportation systems (V2X - Vehicle-to-Everything). AI plays an important role in these technologies, enhancing their functionality and enabling more efficient and intelligent interactions in transportation systems. It is involved in big data processing and analysis, pattern recognition and sensor interpretation, decision-making systems, autonomous driving systems, and warning and safety systems.	The Connected Car technology of the Russian Telematica concern is currently being tested on the smart central ring road. V2X solutions of Russian development allow to receive actual data on the road situation in real time. The system receives information from traffic cameras and sensors about weather conditions, accidents, traffic density, congestion and obstacles on the road.
4 Smart transportation hubs	
4.1 Smart airport	
A smart airport is an airport concept in which advanced technologies are used to improve operational efficiency, ensure passenger safety and optimize resource management. This concept emphasizes technologies such as the Internet of Things (IoT), AI, data analytics, biometrics and others. IoT sensors and devices monitor the condition of equipment, air quality, and noise levels, while biometric technologies are used for identification at access, to enhance security and speed up the process of passing through	Russia's Sheremetyevo Airport has implemented an AI-based "digital twin" system that performs simulation modeling of all key processes (passenger flows, aircraft maintenance, cargo flows, etc.) a year or more ahead.

checkpoints. Machine learning algorithms analyze flight, passenger and baggage data for predictive analytics of possible failures and resource optimization, in managing various aspects of operations such as staff allocation, flight service coordination and infrastructure optimization. The technological structure of a smart airport also includes robots and automated vehicles, energy management systems, and various mobile applications for passengers and staff.	
4.2 Smart Port	
A smart port is a fully automated port where AI, big data, blockchain and Internet of Things technologies are combined in a centralized system. They address the challenges of monitoring, data collection and analysis, process optimization, decision-making assistance, improving efficiency, productivity, safety, environmental friendliness and reducing the likelihood of human error. The role of AI in a smart port is to manage the movement of ships and other transport in the port area, forecasting the need for resources and parking time, and optimizing routes. Internet of Things systems conduct constant monitoring of the state of infrastructure, port equipment, cranes, ship movements, water levels, etc. In addition, the smart port includes information systems of various classes, such as automated container terminals, unmanned vehicles, biometrics, digital platforms and energy-saving technologies.	The Port of Xiamen (China) launched the "Smart Port 2.0" platform in 2020, which includes the application of low-, medium- and high-frequency 5G networks, unmanned container ships, high-precision positioning and multi-sensor control of the Beidou navigation system. This solution is characterized by low investment, short construction time, environmental friendliness and wide applicability.
4.3 Smart railroad and railway station	
Smart railroad and railway station is a concept of developing railway infrastructure using modern technologies to improve efficiency, safety, and sustainability, as well as to provide a more comfortable environment for passengers. AI is used here to manage train movements, optimize train speeds and intervals, and enhance adaptation to changing conditions along the route to improve transportation efficiency. AI and big data enable the collection and analysis of data on track condition, equipment, weather conditions and	Using the Cognitive Rail Pilot platform on the Russian railroad allows using vision and artificial intelligence to detect objects on the railroad, including other trains, switches, tracks, people, traffic lights, etc. The complex can assess the situation, issue danger warning signals to the driver, make necessary decisions in case of his/her lack of reaction, and is also capable of ensuring safety in any weather.

other factors, which can be used to predict maintenance needs, replace equipment, minimize train downtime and reduce the likelihood of accidents. At the railway station, AI plays an important role in ensuring control and safety, monitoring passenger flow, providing personalized service, improved ticket management, and efficient management of energy consumption, lighting and climate at the station.	
5 Robotization and automation of warehouse management	
Various digital technologies are being used to digitalize the warehouse: AI, IoT, digital twin, automation and data analytics. Smart warehouses are equipped with various types of sensors such as RFID tags, temperature, humidity sensors, as well as devices to track the location of goods and equipment in the warehouse, which can monitor the condition of goods, the environment and the operation of equipment in real time. AI is used for demand forecasting, as well as for route optimization, sorting and distribution. Robots play an important role in this concept, which are used to automate processes such as sorting goods, packing, inventory and moving goods around the warehouse. Warehouse management systems (WMS) are being developed, including those with AI components, which combine various technologies to effectively manage all aspects of warehouse operations from receiving goods to shipping.	Russia's X5 Group, which operates the Pyaterochka, Perekrestok and Karusel retail grocery store chains, is using Geek+S20 sorting robots in a number of its distribution centers from 2019.
6 Using AI for driving safety	
AI technologies are actively used to ensure the safety of traffic and vehicle operation. Video-analytics systems of driver's condition (the system detects distractions, driver's drowsiness, which makes it possible to prevent road accidents due to driver's inattention) are actively spreading, and they are also used for traffic monitoring and fixing violations of traffic rules. In addition, telemetry technologies are used in freight forwarding and commercial transportation to monitor driver's driving style and risk profile, and to reconstruct the	In Russia, video analytics from MTS (Skai) analyzes the driver's behavior when the vehicle is moving, and having detected a dangerous condition or behavior, the system immediately warns the driver with an audio/graphic signal and voice notification (regardless of the availability of communication) and sends information about the event to the secure "cloud" SKAI.

circumstances of a road accident. The data obtained can be used to warn the driver, as well as for automated calculation of insurance costs.	
7 Intelligent Transport Systems (ITS)	
AI is being actively used to optimize transportation infrastructure. Modern video analytics systems, connected cars and IoT systems make it possible to analyze data on traffic flows, including information on speed, traffic density and congestion. Using this data in intelligent transport systems allows for more efficient traffic management on roads: controlling the operation mode of traffic lights is one of the most effective ways to optimize traffic flow.	In Russia, as part of the national project "Safe and Quality Highways", AI solutions in the field of traffic flow management are being widely implemented.
8 AI and predictive analytics in transportation and logistics	
8.1 Logistics planning and route optimization	
To allocate resources and manage vehicles, transportation companies use special routing algorithms that are based, among other things, on predictive analytics using machine learning. Such systems for solving routing tasks are capable of learning from data on traffic, weather conditions and other factors to make independent decisions on when and where to send vehicles, what are the ways to optimize planning and how to organize the performance of a particular transportation by the required mode of transport. Such systems provide comprehensive transportation planning and execution capabilities, including fare management, load planning and automated selection of the most appropriate carrier.	Built for Alibaba (China), UPS and project44's "Ware2Go" platform solves the problem of close tracking and logistics coordination by connecting 25,000 e-commerce companies, offering logistics companies smart routing and sorting services, and providing brands with integrated warehousing solutions.
8.2 Demand forecasting	
AI-powered demand forecasting in transportation and logistics helps in planning and optimizing the performance of complex transportation systems. Predictive analytics with AI can more accurately predict demand for transportation services depending on various factors such as time of day, weather, and holidays, as well as plan their resources more efficiently, reduce costs, and improve customer service. Demand forecasting methods include the use of neural networks that are trained on demand data, machine learning algorithms (regression analysis,	Novo Forecast Enterprise software product - allows FMCG and DIY companies, as well as distributors to produce and purchase exactly as much goods as they will be able to sell, minimizing shortages and inventory costs. High forecast accuracy is achieved through the use of Big Data technologies and ML algorithms. This allows companies to create accurate demand plans,

decision trees) and statistical methods (correlation analysis, time series).	align them with financial goals, and optimize supply chain operations.
8.3 Dynamic pricing	
The use of AI-based technologies allows for more accurate forecasting of supply and demand: machine learning algorithms and statistical model building are used, working with observational data, based on which the system/algorithm in an automated format adjusts prices for transportation services in response to changes in external factors important to the company.	The dynamic pricing system developed by Uber (USA) adjusts fares based on a number of variables such as route time and distance, traffic and current demand between drivers. This ensures that there will always be enough drivers on the road, even during peak hours when demand and prices are more likely to increase.
9 AI in vehicle shering systems and in personal mobility equipment (PME)	
AI is used in the shearing industry to improve management processes and service delivery: in demand forecasting, technical condition monitoring, automatic transportation allocation, risk and safety management. One of the promising areas of electric transportation development is AI in PME, which include: electric scooters, electric skateboards, gyroscooters, segways, monowheels and other similar devices. In the field of PME shearing, AI has gained the most traction by improving the use of electric scooters and enhancing road safety. For instance, AI can be used in CCTV cameras to detect violations committed on PME. These devices predominantly work similarly to complexes that record violations by motorists by recognizing vehicle license plates.	A system with traffic cameras capable of detecting traffic violations by PME operators has been tested in Moscow. The devices work on the most popular routes and in places where accidents involving PMEs are concentrated, recognizing three violations: riding off the cycle track and driving in the oncoming lane of the cycle track, driving on PMEs on a crosswalk and driving on one scooter with two people. Spin Insight Level 2 solution developer Drover AI specializes in using IoT artificial intelligence to optimize last-mile transportation services in electric scooters, giving people convenient and fast access from subway stations or public transportation stops to their places of work or residence. The PathPilot platform, using machine learning and computer vision technologies, detects improper sidewalk riding and parking of electric scooters.
10 Digital model of the supply chain	
Digital supply chain model using AI is an innovative approach to managing and optimizing supply chain	Cainiao (China) is working with Procter&Gamble (USA) to develop

processes. It allows tracking and optimizing logistics processes in real time, which helps improve efficiency and reduce costs. Intelligent analysis of aggregated data allows making an optimal set of decisions for each stage of the logistics process: forecasting demand, dynamically adjusting the price for services, choosing the optimal mode of transport and route for transportation. An integrated approach to supply chain management allows to obtain better results compared to separate decision support systems for each process, which is expressed in the strengthening of economic and environmental effects.	the Green Supply Chain digital supply chain system. The system covers and manages the logistics process from purchase to delivery to the consumer. Green Supply Chain is one of the components to achieve Alibaba Group's goals of achieving carbon neutrality and halving emissions by 2030.

Source: based on Intelligent Transportation Systems of Russia (2024)

3 Conclusions

Thus, the considered directions of using AI technologies in the transportation and logistics sphere contribute to improving the efficiency, safety and sustainability of transportation systems. The given examples of using AI solutions demonstrate that AI becomes an indispensable tool for optimizing transport logistics, increasing its efficiency, reliability and cost-effectiveness.

References

1. Pugacheva, O. V., 2023. The use of artificial intelligence in business // Actual issues of modern economic science: theory and practice: a collection of scientific articles. Issue 2. - Gomel: Gomel State University named after F. Skorina, 2023, pp. 209-212.
2. Application of artificial intelligence in priority sectors of the economy, Innopolis, *Interindustry Technology Transfer Center*, 2023 [online] Available at: <https://ai.gov.ru/knowledgebase/v-otraslyakh/2023_primenenie_iskusstvennogo_intellekta_v_prioritetnyh_otraslyah_ekonomiki_innopolis_meghotraslevoy_centr_transfera_tehnologiy/> [Accessed 1 August 2024].
3. Artificial Intelligence in Transportation: Industries, Barriers, Prospects. *Intelligent Transportation Systems of Russia, 2024* [online] Available at: <https://www.itsjournal.ru/articles/interview/iskusstvennyy-intellekt-na-transporte-otrasli-barery-perspektivy/> [Accessed 4 August 2024].

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MEASURING STANDARDS ON INCARCERATION IN CASES OF ECONOMIC CRIMES

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Abstract: The economic area of criminality is currently in a continuous changing process since the legislative tools adopted by the legislator are trying to accelerate the issues of prevention and controlling the phenomenon of economic criminality. It is observed at the regional level that, in most cases of economic crimes, the situation seems to be still unsolved, although the efforts made by the authorities are strongly advanced. The current paper focuses on analyzing the current issues on incarceration, based on ordinary standards provided by the specific law, measuring through several both legislative and judicial contexts. The research activity carried out in this matter has been conducted on a selection of three cases of economic crimes, whose particularities created a serious debate in the field of combating criminality. The process of incarceration of the convicted persons for economic crimes, based on the imprisonment definitive decisions of condemnation pronounced by the courts of law are discussed upon the qualitative research methodology used. It is also organized along with the conceptual stylistic model of designed research paper according to doctrine's references in the matter. The results gathered at the end of the research activity have concluded certain solutions to be implemented in the incarceration system, as well as selective models regarding the standards of incarceration referring to particular cases on economic crimes.
Keywords: incarceration standards; executing punishments; economic crimes; prison facilities; jurisprudence in criminal matters
JEL Classification: K14; K42

1 Introduction

Criminal phenomena are currently developed in a more dynamic context, viewed as an issue created by several circumstances. The same is true in the field of economic crimes, which has very much been encouraged by multiple factors as well. One of them is related to the issue of legislative context, which was many times changed, and the changing status seems to produce consequences in the field of the incarceration of convicted persons. A particular interest regarding the current topic is paid on the cases of economic crimes, whose contextual framework should imperatively be developed in a scientific manner. In fact, the current topic is featured by the issues of the legislative context on measuring standards on incarceration, as a general phenomenon. This is because, as a general rule, there are no differences between the ordinary offences and the economic ones in the field of measuring standards provided by the incarceration system. Nevertheless, a derogatory explanation creates a pertinent occasion to highlight what derogatory characteristics of the incarceration the economic crimes present.

Taking into account the entire provisions regulated by the specific law in the field of incarceration, the issue of measuring standards in this matter is a good occasion for scientists to analyse it and submit real conclusive remarks, as general principles of criminal execution

law. This is because, on the one hand, there are arguments enough to stipulate effective solutions regarding the incarceration area of execution law, and, on the other hand, the economic crimes are still in the doctrine's attention (Levi and Soudijn, 2020) which has seriously extended its area in a larger context. In these circumstances, doctrine contributed actively in developing area of criminal execution law, especially in the field of economic crimes (van Driel, 2018). Thus, in a macro-environment of crime, the economic area of criminality appears a structured form of manifestation in criminal matters, and the *de facto* situation grows annually in a constant manner.

Practically, the issue of economic crimes begins with the law enforcement agencies' control in the economic fields, then it crosses over the criminal proceedings when the judicial mechanisms in criminal matters are activated, and, finally, it is subordinated to the specific environment of execution of punishments, in those criminal cases in which the courts of law pronounced a judicial decision of condemnation in accordance with the rules and principles of due process. Taking into consideration the above-stated remarks, it should be pointed out that there is no potential context of analysing standards of incarceration than the economic field offers. For this reason, the only one way of developing the issues discussed in this context is that of expanding hypotheses on measuring standards on incarceration in cases of economic crimes.

The current paper is based on the research activity conducted on the topic of measuring standards on incarceration in cases of economic crimes, which used a common style of approach, designed through several directions. One of them refers to the legislative framework adopted in the field of economic crimes (Coffee, 2020) and criminal execution law. The second one targets to the jurisprudential references in criminal matter, a particular attention being paid on those cases of economic crimes which present a significant interest for the current paper. Finally, the third approach is related to doctrinal manner of analysing the issue, based on a theoretical context. Respecting the three coordinates presented, the methodology used has been focused on some specific questions, as the following:

(1) What is the nature of standards on incarceration in the field of economic crimes?
(2) Why analysing the issue of incarceration standards in this field?
(3) How to highlight the importance of the standards in a specific context?
(4) What consequences produce the measuring standards for economic crimes?

In order to gather comprehensive results during the research activity on the current topic, one of the major issues was to identify the potential category of economic crimes which better fit to the directions of analysing and measuring standards regarding the incarceration context. The research methodology is also designed through the contextual crimes committed in the field of economic, but featured with certain specific categories of these crimes, taking into account that the courts of law do not pronounce judicial decisions of condemnation in all cases of economic crimes, on the one hand, and do not convict defendants with incarceration in all cases, on the other hand. Thus, only one kind of economic crimes have to be analysed in a larger context, depending on the solutions decided by the courts of law at the end of criminal proceedings. Consequently, the jurisprudence in criminal matters plays an important role in managing the selection of the economic crimes (Albanese, 2021), based on decisions pronounced by the judicial bodies in cases of condemnation with incarceration. The overall objective scope is then

concordant to the principle of equality based on due process requirements, as central issue, and, last but not least, the decisions pronounced in these circumstances should be subordinated to execution of punishments through incarceration. In this regard, one competence is declined to the executing bodies which carried out their activities in prisons. Thus, both competences – judicial and executional – have to be analysed through assessing the judicial decision both at the end of criminal proceedings and during the stage of execution of punishments.

2 Specific Background on the Economic Crimes

2.1 The Issues of Economic Crimes

As a general remark, it could be stated that a relevant solution in the field is outlined in criminal matters in those cases of economic crimes. These cases present a specific character of illegality and need a particular attention in order to understand what differences between them and other ordinary crimes exist. The relevance of these crimes comes to clarify even the potential detachment of the first category from the other ones, although, under a general consideration, a common idea of crime – illegal activity – should be conformed to the criminal activity entirely (Weisburd *et al.*, 2023). Thus, speaking about the jurisprudence in criminal matters, there are discussions on the manner in which the courts of law solve the cases of serious crimes and those of economic crime, excepting the cases in which they are also qualified as serious crimes. In this regard, a selection of economic crimes is a good occasion to highlight particular situations in which the standards of incarceration could be analyzed.

Particularities of the economic crimes are not a new item in the field of criminal proceedings, although some legislative changes have been produced in the last time period (Directive EU 2018/843; Directive EU 2015/849; Law no. 129 of 2019), carried out in order for the law enforcement agencies to better control the situation existed in practice. Moreover, it could be emphasized that these modifications came from the stringent necessity of the EU Member States of respecting the European directives which have, at the same time, been adopted rapidly in a relative short period of time. In a predictable legislative framework, both the EU authorities and the national ones are fully involved in processing data and information on how to manage and maintain the legislative tools at a higher level of security both for individual and society.

Analyzing the jurisprudence in criminal matters, it is obvious that the tax evasion seems to be one of the most dangerous crimes committed in the field of economic crimes, along with the other serious crimes which comprise money laundering, committed by the organized crime groups. Despite their dangerous feature the economic crimes are characterized with (Button, 2022), there is no doubt that the jurisprudence in this field is so spread up and, in the last five years period of time, the judicial decisions pronounced by the courts of law in Romania split over the entire system in criminal cases. This is the first importance of studying the economic crime in a macro-dimension of the stylistic context, discussed around the idea of managing and measuring standards on incarceration system. This is because, in fact, there is no possibility to organize a relevant question regarding the standards of incarceration for those crimes committed in economic context, as long as these crimes are not analyzed enough both from a criminal law and criminological perspective and there are methodological complementary solutions for the economic crimes (Aljinović and Bartulović, 2023). Additionally, the criminal

group actions the economic crimes belong to, meaning the serious crimes (particularly from the point of view already specified in the above-stated sentences) require a full involvement of the judicial authorities in providing information on how the incarcerated people live and spend they time in prison (Assad, 2019).

Taking into account the remarks provided earlier, it is obvious that the environment created by the economic crimes proves to be a lawful contextual direction on the incarceration, on the one hand, and on the standards provided by the special law in the matter of incarceration itself, on the other hand. The characteristics are thus incorporated in a unique pattern of executing judicial decisions pronounced by the criminal section of the courts of law in cases of economic crimes. Equally, the economic crimes do not exceed the overall area of a sentencing system which is preponderantly harmonized with the entire system of incarceration. Taking into account these points, the standards of incarceration for the cases of serious crimes subsist under the general theory of due process, viewed in a larger space of the European context, already provided by the Council of Europe.

2.2 Jurisprudence on the Economic Crimes

In a more dynamic criminal environment in which the economic crimes are committed, the jurisprudence offers a broad space with detailed criminal actions and *modus operandi* used by the perpetrators. It is well-known that it is impossible for scientists to analyze them through only one criterion and, for these reasons, the research activity conducted on the current topic has taken into consideration no less than three case-studies model selected on the jurisprudence regarding the economic crimes. They refer to the cases based on the crimes of tax evasion, the cases of money laundering and the cases of banking crimes.

(I) Cases of tax evasion

The court of law has pronounced a judicial decision to condemn the defendant at seven years imprisonment for committing the crime of tax evasion in a continuous form, as it is incriminated by Article 9 para 1 and 2 of the Law on tax evasion of Romania (Law no. 241 of 2005) for the criminal action committed during 2014-2016 (HCCJ, 2024a). In the matter of practice, the court of law has stated that the crime of tax evasion is frequently concurrently committed with another kind of crimes, which usually deal with accounting crimes, as well as banking area of criminality. In fact, the defendant was accused of having committed the crime of tax evasion, because, as a representative of a limited liability private company, has been deducted from the fiscal contribution payment which should be paid to the consolidated budged of the state, part of them being represented by the corporate tax and another one by the value added tax. The consequence of the criminal actions committed was the omission of registering earned income in the accounting documents.

From a procedural perspective, once the court of law pronounced the judicial decision of condemnation, the convicted persons have to execute the punishment in incarceration, and no limits to parole release is determined at the moment of the beginning of execution. Only in a few attenuating circumstances, the court of law may decide to suspend the execution of punishment. In this case, a probation period will be assigned and the convicted persons should imperatively respect it. Otherwise, they have to return to incarceration facilities in order to execute the entire period of

executing punishment.

In some cases of tax evasion, defendants try to convince the judgment that the principle of legality in criminal matters should be applied with reference to the issue of absent crime which is not provided by the substantive criminal law (Kemsley and Kemsley, 2024), also theorized by the defense party (HCCJ, 2024a). Certain arguments have to be submitted in purpose to state upon the defense's general theory, such as one related to the fact that the defendant has been complied to the financial official documents of accountancy, and another one that the crime is a simply offence, but not a crime, and, for this reason, it should receive another legal qualification, including a less sanction.

Other convicted persons have been condemned for having committed the crime of trading the tainted goods, as the criminal action is incriminated by Article 358 of Criminal Code of Romania due to the fact that the gained income from these commercial operations was not officially registered in accounting documents, although, relating to these ones, the convicted persons could be prevailed on the inexistent legal obligation to declare them (HCCJ, 2024a). Regarding the last issue, the court of law has stated that the indictment act has retained that the convicted person has been accused of having committed several criminal actions, such as those related to infringing the obligation of mentioning some economic operations of goods purchasing and registering them under management; transferring goods between successive inventories in many working points; receipting amount of money through using false electronic fiscal means of payment. Consequently, the process of measuring standards in cases of the crime of tax evasion is a useful instrument of assessing the execution of punishment for particular crimes, as those related to the economic crimes are.

(II) Cases of money laundering

The discussion on the crimes of money laundering is not a new item for the field of jurisprudence. Equally, the legislative framework, both at the European level (Directive EU 2018/843) and at the national level as well, has opened new perspectives for the process of assessing the standards for incarceration in this matter. An essential criterion for the court of law to convict defendant for committing the crime of money laundering is to state, beyond reasonable doubt, that the predicate crime exists (Rossel *et al.*, 2022; Erken and Turksen, 2024). In these circumstances, the criminal action committed means that the 'laundered' goods should originate from another crime previously committed to which it is subordinated (Pierini, 2020). The jurisprudence has stated that, in this context, the crime of money laundering has a correlative character (HCCJ, 2024b). This means that the crime of money laundering could exist in a major context given by committing another crime previously, between them being established a coordinated relation of execution of criminal actions (Matanky-Becker, 2024). Moreover, the goods used in the money laundering should come from another crime. From a procedural point of view, the defendant must know his illicit activities committed on the laundering of goods came from another crime, as predicate crime, on the one hand, and the evidence administered in the criminal case should imperatively prove that illicit behavior used by the defendant, on the other hand.

By definition, the crime of money laundering is a criminal action conditioned by committing a predicate crime the illicit goods are resulted from (HCCJ, 2024b). In this regard, the perpetrator

presents a dangerous behavior as long as the perpetrator has dissembled the illicit origin of goods (HCCJ, 2023a; Costa and Jancsics, 2024). This *modus operandi* is possible through using apparent licit operations. Despite this feature, the rule of criminal procedure law does not require that the crime of money laundering to be committed by the same or different perpetrator, as the predicate crime (HCCJ, 2024b). From a legal perspective, the operations of money laundering are executed through an action of apparent legality given to an illicit economic operation of resulting the proceeds of crime. It means a dynamic process developed in several stages successively, from illegal proceeds of crime gathered from illicit economic operations to dissembling the illicit origin of the proceeds of crime and, finally, to reinvesting them into apparent licit economic operations. In fact, those operations comprising the crime of money laundering are illegal ones, and fall under the legal provisions of criminal law.

At the moment of convicting defendants as well as after this moment, it is very important for the law enforcement agencies to know the level of involvement of executing authorities in the process of execution of punishment itself at the incarceration facilities and what kind of standards are related to the manner in which the convicted persons for committing the crime of money laundering are penetrating them. The measuring standards could be influenced by the manner in which the judicial bodies, in particular the courts of law, decided in the criminal cases solved through pronouncing judicial decision of convicting defendants.

(III) Cases of smuggling goods

In cases of smuggling goods, because of the limited years of punishment provided by the substantive provisions of criminal law, the condemnation of defendants with imprisonment could be established by the court of law in those criminal cases in which they committed this kind of crime as concurrent to other crimes. Usually, the last ones particularly refer to tax evasion, counterfeiting goods or money laundering (Court of Appeal of Bucharest, 2020). In other similar criminal cases, the court of law also may condemn defendants, but, from a jurisprudential point of view, the case-law solutions have stated that the decision of condemnation is, most of the time, based on the injunction of executing punishment. Moreover, doctrine in criminal matters has pointed out that, in some cases, the issue of unnecessary incarceration is needed (Makar, 2020). Nevertheless, the court of law has convicted defendant in the case of committing smuggling continuously (Court of Law of Suceava, 2021), which, in fact, stated that the defendant has smuggled several tobacco packets through avoiding tax stamp, which should be placed under custom point at border control. By subjective aspect, the perpetrators knew the illicit origin of goods and also the damage caused to the state's budget by their criminal action of smuggling goods which come from extra-communitarian area.

From a practical perspective, the court of law has retained that the criminal acts of smuggling goods have been considered crime at the time of committing them, being indifferent the amounts of packets held or transported, the criminal action which did not require the indictment act of crime incriminated at Article 425 of Fiscal Code of Romania (Constitutional Court Decision, 2022). By law, the crime provided by Article 270 para (3) of Law no. 86 of 2006 has been decriminalized. This is a legal situation created as a consequence of the new legal framework entered into force through the intervention of the Constitutional Court of Romania. However, the court of law has also retained that the criminal acts are subordinated to the crime

of possessing goods outside of the fiscal warehouse, as regulated by Article 452 para (1) letter h) of Law no. 227 of 2015, which provides that, under objective aspect, possessing or commercializing products subject to excise duty outside the fiscal warehouse are being considered crime (HCCJ, 2023b). Thus, analyzing the above-stated actions and circumstances, the discussion should be directed to two conditions which should imperatively be met. It is about the action of possessing proceeds outside the fiscal warehouse, on the one hand, and proving that the defendant has known the illicit origin of the proceeds, which specifically come from smuggling goods. Equally, the courts of law have to differentiate between the legislative provisions stipulated by the Law on Fiscal Code and the Law on Custom Code, the differentiation which determines and limits the issue of smuggling goods and other crimes incriminated by another law.

3 Standards of Incarceration for Economic Crimes

3.1 Specific Remarks on the Standards of Incarceration

The aspects regarding the standards of incarceration appear as a must-have discussion at the time of any infringements in the convicted persons' rights during incarceration. First of all, it should be pointed out the situation created by the mass incarceration whose solutions have retained attention of the judiciary in several judicial executing system of criminal procedure (Tonry, 2014). One of the entitled issues are related to the nature of crimes committed, on the one hand, and the length of punishment which should be executed by the convicted persons, on the other hand. These provisions expressly state that the convicts must legally be divided into serious convicts and less incarcerated convicts, as to prevent any kind of crimes which could further be committed by the convicts after liberation, as a consequence of their 'training' spent in incarceration. Actually, the economic crimes present a particular interest for the incarcerated convicts once they arrive in prisons and where they meet other convicts who have usually been condemned for most serious economic crimes. It is thus a real 'competition' among convicted persons who spent their time in prisons, because of the fact that they are looking for a more comprehensive criminal style of committing economic crime in a more dynamic criminal environment through using an extensive *modus operandi*. This is *de facto* situation which results from the convicts' future criminal behavior in accordance with the rules on criminal actions trained during incarceration and the length of time spent in incarceration accordingly.

An interesting issue is proved by the scientists whose works have been devoted to the incarceration rate. It is appreciated as a "measurement of the degree of punitiveness in a society, although it is an imperfect measurement" (Mauer, 2017). Doctrine has during the years been involved in finding solutions to this kind of issue (Simon, 2014). Actually, it is not based on the economic crime analysis, but, despite this inconvenience, it could be highlighted that the incarceration environment is a multi-factorial one, with influences over the criminal behavior and, for this reason, the economic crimes present importance as well. No less than four standards on incarceration are to be discussed in this context.

(1) One of them refers to *the crime control*. It is a standardized relation which cannot be separated from other issues the incarceration environment is still connected to.

(2) The second one is related to the *degree of inequality in incarceration*, as long as there is no

doubt that the convicted persons condemned for committing economic crimes are placed in an open or half open regime of incarceration due to the fact that their convictions involve a short length of incarceration period.

(3) The third standard on incarceration is related to *the nature of crime committed*. This issue refers to the fact that it is obvious for the convicted persons incarcerated for serious crimes to be separated from those who execute punishments for committing ordinary economic crimes. The argument is subordinated to the previous statement which provides that the convicts should be separated in accordance with the nature of crime committed and the length of punishments they have to execute in prison.

(4) Finally, the fourth issue involves *the safety benefits* of executing punishments. It refers to the good behavior rules the convicted persons accustom in prison facilities. It is a real guarantee that they do not accustom another more serious criminal behavior any more.

As it could be observed from the above-stated standards on incarceration, one of the main attentions is paid to the core features of the crime committed. It is about the nature of crime, which is still remarked after the activity of solving criminal proceedings through pronouncing definitive criminal decision, and produces consequences even during the period of execution of punishment in incarceration. This is a real priority given by the legal authorities at the moment of incarceration, on the one hand, and during the entire period of execution of punishment, on the other hand. Equally, the guarantee on safety of the incarcerated persons is a good criterion for characterization of the standards of incarceration. The same is true with the incarceration of minor convicts who are more vulnerable people (Assad, 2019) and, for this reason, they need a particular attention.

3.2 Measuring Standards of Incarceration

As a general remark, the incarceration period the convicted persons spend in prison differs from a national system of law to another one. It is well-known that there are no common criteria of classification of the standards of incarceration as long as they could be selected and included in different casual environments. From institutional anomie to cross-national differences (Weiss *et al.*, 2020), the process of measuring standards of incarceration is thus a multi-disciplinary action focused on the crime committed by the incarcerated persons, the specific conditions of incarceration which depend on the national system of prison entirely. The conceptualization of the incarceration system of prisons remains a subject of respecting both general and specific standards for the incarceration process and every requirement may be respected in accordance with the system of justice itself. Actually, the conceptualization of incarceration system is a manner of analyzing the form of measuring standards on incarceration.

Another form of measuring standards of incarceration is featured by the manner in which the incarceration affects reoffending (Rose and Shem-Tov, 2021) or even its impact on recidivism (Loeffler and Nagin, 2022) knowing the fact that, in several cases of incarcerated persons, some of them are committed other crimes once they are discharged. The violence present in the incarceration environment is known as a very difficult issue the security authorities involved in the process of prison system are usually faced with. Indeed, the issue of violent incarceration (McCulloch and Scraton, 2023) has several times been discussed by the doctrine in criminal matters, which focused its attention on both violence conducted by the incarcerated persons, and

by the security bodies as well. In the first case, the violent groups of convicts can appeal on the disorder and instability, while the second one is characterized by the procedure of establishing order and stability. Thus, both forms have an antagonistic feature, as long as they have specific focus, aims and procedures used in this context. The extrinsic measuring standards of incarceration is frequently compared with the same situation spent in the 1990's or even before, compared then with the same situation in the 2000s (Western *et al.,* 2021). The standard of security is, consequently, viewed as a new potential form of victimization (Meade *et al.,* 2021) which usually appears in cases of incarcerated women, the issue also very much discussed by doctrine in the matter (Saxena and Messina, 2021; Caravaca-Sánchez *et al.,* 2023).

The process of measuring standards on incarceration finally refers to inequalities in prison, an issue already debated by the doctrine in several countries (Turney, 2021; Craigie *et al.,* 2020). Measuring standards related to the inequalities in incarceration involves also standards on living in prison, and this issue does not require a new approach, despite the particular feature it is characterized with. Although it is about both a theoretical and practical issue, the concept of inequalities in prison should be analyzed from the perspective of the consequences it produces in practice, more than a standardized issue approached by the theory of criminal law.

4 Conclusion

The concept regarding the standards on incarceration as well as its measuring in the macro-environment of the economic crimes have proved to be a coherent opportunity for the current study to highlight certain pertinent discussions regarding the issues spread up in a qualitative research context, on the one hand, and advance solutions on adequate area of the justice system in criminal matters related to the incarcerated persons, on the other hand. The manner in which the solutions come from the practical field is one of the most complex defining areas of standardization of the incarceration and the time the convicted persons spend in this environment. The process of measuring standards of incarceration in cases of economic crimes has provided certain unexpected difficulties in arranging the right solutions due to the fact that, as a rule, just a few criminal cases are solved through pronouncing solution of incarceration by the courts of law. In many cases, the judgment decides that the decisions of condemnation should suspend the punishment of incarceration through a stated parole period.

Despite the general conceptualization of the incarceration environment, the standards of incarceration are comprehensively proved and organized around certain adjacent channels, which usually involve the security and safety in prison, the nature of crime committed, the total length the convicted persons spent in prisons, as well as the degree of violence among the incarcerated persons. All of them have for a long time discussed by the doctrine in criminal matters, which advanced some pertinent solutions on how to straighten the real situation which occurs in practice.

A complicated environmental context appears in those cases in which the convicted persons are 'trained' in prisons in terms of how to develop their abilities in committing other serious economic crimes once they are discharged from prison. It is a serious issue for the judicial authorities as well, who are in certain limited cases unable to find appropriate solutions in the field of maintaining right standards on incarceration.

Regarding the economic crimes, the situation seems to be less complicated due to the fact that the convicted persons are incarcerated in open-space or half open regime of execution of

punishment and, taking into account what it refers to, it should be highlighted that the convicts are more involved in respecting the standards of incarceration at any time of the execution of punishment. However, the law enforcement agencies of incarceration area should be open-eyed normally permanent contact on the convicted persons in order to avoid any kind of disturbance which could be happened in prison.

The conclusive remarks provided on the approached topic have stated that, in a more expanded criminal environment the incarceration space is characterized with, the process of measuring standards on incarceration in cases of economic crimes should be more deepened in order for the scientists to find more comprehensive solutions on how to preserve the issue of safety in prisons. Moreover, the issue is currently focused on how to create a substantial regime to highlight the core decisions in which the standards on incarceration are fully respected. It is preponderantly viewed in cases of tax evasion, money laundering and smuggling goods. This could be solved in the field of economic crimes through finding appropriate legal instruments of measuring standards on incarceration.

References

1. Albanese, J. S., 2021. Organized crime as financial crime: The nature of organized crime as reflected in prosecutions and research. *Victims & Offenders*, 16(3), pp.431-443. https://doi.org/10.1080/15564886.2020.1823543
2. Aljinović, N. and Bartulović, M., 2023. Money laundering – Comparative analysis of tax evasion as a predicate crime in the EU Member States. In: *The Interdisciplinary Management Research,* pp.570-587.
3. Assad, M. D., 2019. Psychological approach of the minors' legal status during their incarceration in the Romanian detention centers. *Journal of Social Science,* 15, pp.167-172. https://doi.org/10.3844/jssp.2019.167.172
4. Button, M., Hock, B. and Shepherd, D., 2022. *Economic crime: From conception to response*. London: Routledge.
5. Caravaca-Sánchez, F., Aizpurua, E. and Wolff, N., 2023. The prevalence of prison-based physical and sexual victimization in males and females: A systematic review and meta-analysis. *Trauma, Violence, & Abuse*, 24(5), pp.3476-3492. https://doi.org/10.1177/15248380221130358
6. Coffee Jr, J.C., 2020. *Corporate crime and punishment: The crisis of underenforcement*. Oakland: Berrett-Koehler Publishers.
7. Constitutional Court Decision no. 176 of 24 March 2022, published in Official Journal of Romania no. 451 of 5 May 2022.
8. Costa, J. and Jancsics, D., 2024. Turning legally obtained resources into illegal payments: A money dirtying scheme. European Journal on Criminal Policy and Research. https://doi.org/10.1007/s10610-024-09591-z
9. Court of Appeal of Bucharest – Criminal Sentence no. 177/F of 14 September 2020.
10. Court of Law of Suceava – Criminal Sentence no. 667 of 29 September 2021.
11. Craigie, T.A., Grawert, A. and Kimble, C., 2020. *Conviction, imprisonment, and lost earnings. How involvement with the criminal justice system deepens inequality*. New York: Brennan Center for Justice.
12. Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC, published in OJ L 141/73 of 5 June 2015. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32015L0849> [Accessed 15 August 2024].
13. Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU, published in OJ L 156/43 of 19 June 2018. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L0843> [Accessed 15 August 2024].
14. Erken, E. and Turksen, U., 2024. *Anti-money laundering and the law: Comparative approaches to countering predicate crimes*. Routledge.
15. Kemsley, D. and Kemsley, S.A., 2024. Tax evasion savings versus unlawful predicate proceeds: A substance-

based approach. *Journal of Money Laundering Control*, 27(4), pp.647-657. https://doi.org/10.1108/JMLC-12-2023-0196
16. Law no. 129 of 11 July 2019 on preventing and combating money laundering and terrorism financing, as well as on modification and completing other legislative documents, published in the Official Journal of Romania no. 589 of 18 July 2019.
17. Law no. 241 of 15 July 2005 on tax evasion, published in the Official Journal of Romania no. 672 of 27 July 2005.
18. Loeffler, C.E. and Nagin, D.S., 2022. The impact of incarceration on recidivism. *Annual review of criminology*, 5(1), pp.133-152. https://doi.org/10.1146/annurev-criminol-030920-112506
19. HCCJ (High Court of Cassation and Justice of Romania) – Criminal Decision no. 74/RC of 13 February 2024a. Available at: <https://www.scj.ro/> [Accessed 12 August 2024].
20. HCCJ (High Court of Cassation and Justice of Romania) – Criminal Decision no. 15/RC of 11 January 2024b. Available at: <https://www.scj.ro/> [Accessed 14 August 2024].
21. HCCJ (High Court of Cassation and Justice of Romania) – Criminal Decision no. 798/RC of 28 November 2023a. Available at: <https://www.scj.ro/> [Accessed 14 August 2024].
22. HCCJ (High Court of Cassation and Justice of Romania) – Criminal Decision no. 373/RC of 14 June 2023b. Available at: <https://www.scj.ro/> [Accessed 9 August 2024].
23. Levi, M. and Soudijn, M., 2020. Understanding the laundering of organized crime money. *Crime and Justice*, 49(1), pp.579-631.
24. Makar, Z., 2020. Unnecessary incarceration. *Oregon Law Review*, 98, pp.607-669.
25. Matanky-Becker, R., 2024. High-end and cash-based money laundering: Defining and disaggregating complex phenomena. European Journal on Criminal Policy and Research. https://doi.org/10.1007/s10610-024-09579-9
26. Mauer, M., 2017. Incarceration rates in an international perspective. In *Oxford research encyclopedia of criminology and criminal Justice*.
27. McCulloch, J. and Scraton, P., 2023. The violence of incarceration: An introduction. In: *The violence of incarceration*. Routledge, pp.1-18.
28. Meade, B., Wasileski, G. and Hunter, A., 2021. The effects of victimization prior to prison on victimization, misconduct, and sanction severity during incarceration. *Crime & Delinquency*, 67(12), pp.1856-1878. https://doi.org/10.1177/0011128720977440
29. Pierini, J.P., 2020. Extraterritorial jurisdiction and sovereignty. The characterization of foreign predicate offenses for prosecution of derivate offenses (as money laundering) and the consideration of extraterritorial conduct as part of territorial offenses. *Rassegna della Giustizia Militare*. Available at: <https://ssrn.com/abstract=3690974 or http://dx.doi.org/10.2139/ssrn.3690974/> [Accessed 21 August 2024].
30. Rose, E.K. and Shem-Tov, Y., 2021. How does incarceration affect reoffending? Estimating the dose-response function. *Journal of Political Economy*, 129(12), pp.3302-3356.
31. Rossel, L., Unger, B. and Ferwerda, J., 2022. Shedding light inside the black box of implementation: Tax crimes as a predicate crime for money laundering. *Regulation & Governance*, 16(3), pp.781-800. https://doi.org/10.1111/rego.12407
32. Saxena, P. and Messina, N., 2021. Trajectories of victimization to violence among incarcerated women. *Health & Justice* 9(18), pp.1-12. https://doi.org/10.1186/s40352-021-00144-8
33. Simon, J., 2014. Ending mass incarceration is a moral imperative. *Federal Sentencing Reporter*, 26(4), pp.271-275. https://doi.org/10.1525/fsr.2014.26.4.271
34. Tonry, M., 2014. Remodeling American sentencing: A ten-step blueprint for moving past mass incarceration. *Criminology & Public Policy*, 13(4), pp.503-533. https://doi.org/10.1111/1745-9133.12097
35. Turney, K., 2021. Inequalities in jail incarceration across the life course. *Proceedings of the National Academy of Sciences*, 118(19). https://doi.org/10.1073/pnas.2104744118
36. van Driel, H., 2018. Financial fraud, scandals, and regulation: A conceptual framework and literature review. *Business History*, 61(8), pp.1259-1299. https://doi.org/10.1080/00076791.2018.1519026
37. Weisburd, D., Maher, L., Sherman, L., Buerger, M., Cohn, E. and Petrosino, A., 2023. Contrasting crime general and crime specific theory: The case of hot spots of crime. In: *New directions in criminological theory*. Routledge, pp. 45-70.
38. Weiss, D.B., Testa, A. and Rennó Santos, M., 2020. Institutional anomie and cross-national differences in incarceration. *Criminology*, 58(3), pp.454-484. https://doi.org/10.1111/1745-9125.12242
39. Western, B., Davis, J., Ganter, F. and Smith, N., 2021. The cumulative risk of jail incarceration. *Proceedings of the National Academy of Sciences*, 118(16). https://doi.org/10.1073/pnas.2023429118

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THE LEGAL ASPECT OF THE GREEN ECONOMY

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Abstract: The transition to a green economy is essential for promoting sustainable development and addressing urgent global environmental challenges. This paper explores the legal aspects of the green economy, emphasizing the function of law in both promoting and regulating this transition through qualitative research methodologies. It analyzes significant legal frameworks at international, regional, and national levels that underpin green economic policies and practices. The analysis underscores the essential role of legal instruments in fostering environmental integration, ensuring intergenerational equity, safeguarding human rights, and enhancing corporate responsibility. Additionally, the paper discusses the challenges and opportunities associated with implementing green economy policies, emphasizing the need for innovative legal approaches to overcome barriers and encourage green investments. By exploring the progression of policy dialogues and legal initiatives established at pivotal international gatherings, such as Rio+20, this research offers critical insights into the advancements and constraints of current legal frameworks. The findings underscore the essential role of law in advancing a sustainable and inclusive green economy, stressing the need for continuous legal innovation and international collaboration. This paper contributes to the ongoing discussion of sustainable development by delivering a detailed legal perspective on the green economy. It aims to engage policymakers, legal practitioners, and researchers in assessing the efficacy and deficiencies of existing legal systems in promoting a sustainable and environmentally conscious future.
Keywords: Green Economy, Legal aspects, Legal framework, corporate governance.
JEL Classification: Z18, D69, F69, F59, F39.

"Let us ponder this profound question: Have we truly attained, or are we nearing, the essence of our humanity and the sweet fragrance of happiness? Are we approaching our ultimate goal? If not, it appears that our aspirations may have been rooted in humanity, yet the sincerity of our intentions remains open to scrutiny."
Abrar Ashraf

Introduction

The green economy represents an economic model that emphasizes sustainable development through the integration of environmental health, economic growth, and social well-being. This model emphasizes the reduction of environmental risks, the promotion of resource efficiency, and the fostering of sustainable practices across diverse sectors. Central to the green economy is the legal framework that underpins it, as this framework establishes the rules, regulations, and standards that direct governmental policies, corporate behavior, and international cooperation toward sustainability.

Legal instruments, which encompass international treaties as well as national legislation, play a critical role in shaping the course of the green economy. They provide the necessary structure

for implementing environmental policies, enforcing compliance, and promoting innovation in green technologies. In the face of pressing global challenges such as climate change, resource depletion, and environmental degradation, robust legal frameworks are necessary for steering the global economy toward sustainability**.**

The international and national legal frameworks

The green economy is heavily governed by international agreements and organizations, which function as the foundation for national regulations. Several international treaties and agreements play essential part in governing environmental issues as mentioned in Table no.1 as International legal Frameworks.

Table 1 International Legal Frameworks

Date	Framework	Scope	Summery
1972	Stockholm Declaration on the Human Environment	International	Initiated at the first global conference on the environment, this declaration laid down 26 principles for environmental protection and sustainable development. It emphasized the importance of international cooperation and human rights in environmental policies.[1]
1987	Brundtland Report (Our Common Future)	International	Authored by the World Commission on Environment and Development, it popularized the term "sustainable development," highlighting the interconnectedness of economic development and environmental sustainability.[2]
1992	Rio Earth Summit (Agenda 21)	International	A comprehensive action plan with strategies for sustainable development addressing issues like poverty, biodiversity, and pollution. Agenda 21 emphasizes local-level implementation and partnerships.[3]
1997	Kyoto Protocol	International	This legally binding agreement under the UNFCCC required developed countries to reduce greenhouse gas emissions by an average of 5.2% below 1990 levels during the commitment period (2008-2012). It introduced market-based mechanisms such as emissions trading.[4]
2000	Millennium Development Goals (MDGs)	International	Set of eight international development goals established following the Millennium Summit, emphasizing poverty reduction, gender equality, and environmental sustainability as key components of global development.[5]
2005	EU Emissions Trading System (EU ETS)	Regional (EU)	The first major carbon market, it established a cap-and-trade system for greenhouse gas emissions, aiming to reduce emissions from power plants and heavy industries in the EU.[6]
2006	United Nations Declaration on the	International	A comprehensive framework recognizing the rights of indigenous peoples, including their relationship to land and

[1]UN Conference on the Human Environment, Stockholm (1972).
[2]World Commission on Environment and Development (WCED), "Our Common Future" (1987).
[3] UN Conference on Environment and Development (UNCED), "Agenda 21" (1992).
[4] UN Framework Convention on Climate Change (UNFCCC), "Kyoto Protocol" (1997).
[5] UN Millennium Summit (2000).
[6] European Union Directive 2003/87/EC

Date	Framework	Scope	Summery
	Rights of Indigenous Peoples		resources, which is crucial for sustainable environmental practices.[7]
2009	Copenhagen Accord	International	This non-binding agreement sought to limit global temperature increase to 2°C above pre-industrial levels, recognizing the importance of financial and technological support for developing countries.[8]
2012	Green Economy Initiative (UNEP)	International	This initiative promotes transitioning to a green economy, focusing on reducing environmental risks and enhancing human well-being. It encourages low-carbon, resource-efficient, and socially inclusive practices.[9]
2012	Rio+20 Conference	International	Also known as the United Nations Conference on Sustainable Development, this conference resulted in "The Future We Want," emphasizing sustainable development and the green economy as essential to achieving sustainable development goals.[10]
2015	Paris Agreement	International	A landmark agreement to limit global warming to well below 2°C, with efforts to limit it to 1.5°C. Countries submit nationally determined contributions (NDCs) and are encouraged to increase their climate ambitions over time.[11]
2015	Sustainable Development Goals (SDGs)	International	A set of 17 goals adopted by UN member states in 2015, addressing a broad range of global challenges, including poverty, inequality, and climate change, with a goal of achieving these by 2030.[12]
2016	Green Bond Principles	International	Voluntary guidelines that promote transparency and integrity in the green bond market, facilitating investments in environmentally sustainable projects.[13]
2017	EU Clean Energy Package	Regional (EU)	A legislative package aimed at achieving the EU's climate and energy targets for 2030, focusing on energy efficiency, renewable energy sources, and energy security.[14]
2019	European Green Deal	Regional (EU)	A strategic plan aimed at making Europe climate-neutral by 2050, involving legislative proposals to ensure sustainable economic growth while addressing climate change and protecting biodiversity.[15]
2020	EU Taxonomy Regulation	Regional (EU)	A framework establishing criteria for determining which economic activities can be considered environmentally

[7] United Nations General Assembly, "Declaration on the Rights of Indigenous Peoples" (2007).
[8] UNFCCC COP15, Copenhagen (2009).
[9] UN Environment Programme (UNEP), "Green Economy Initiative" (2012).
[10] UN Conference on Sustainable Development (2012).
[11] UNFCCC COP21, Paris (2015).
[12] United Nations General Assembly, "Transforming our world: the 2030 Agenda for Sustainable Development" (2015).
[13] International Capital Market Association (ICMA), "Green Bond Principles" (2016)
[14] European Commission, "Clean Energy for All Europeans" (2017).
[15] European Commission, "European Green Deal" (2019).

Date	Framework	Scope	Summery
			sustainable, guiding private investment toward green projects. [16]
2021	Fit for 55 Package	Regional (EU)	A comprehensive policy initiative aimed at reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels, covering multiple sectors including transport, energy, and industry.[17]
2022	UN Biodiversity Conference (COP15)	International	A significant conference aiming to adopt a new global biodiversity framework to halt and reverse biodiversity loss, linking ecological health with economic prosperity.[18]
2022	Inflation Reduction Act	National (US)	A major piece of legislation focusing on climate change mitigation, with significant investments in renewable energy, electric vehicles, and energy efficiency measures, aiming for a 40% reduction in carbon emissions by 2030.[19]
2023	UN Climate Ambition Summit	International	A summit aimed at accelerating climate action and increasing commitments toward the Paris Agreement goals, emphasizing the need for urgent and concrete actions to mitigate climate change.[20]
2024	Global Stocktake (Paris Agreement)	International	Scheduled assessment to evaluate collective progress towards achieving the goals set in the Paris Agreement, aiming to strengthen commitments and actions globally. [21]
2024	EU Circular Economy Action Plan 2.0	Regional (EU)	A strategic plan focusing on waste reduction, sustainable product design, and promoting circular economy practices across various sectors, including textiles and electronics.[22]

Source: own work based (collection of data)

Whereas, International agreements provide a comprehensive framework, distinct nations are responsible for performing laws and regulations that promote sustainable economic growth. Various countries have developed their legal frameworks to support the transition to a green economy as illustrated in Table no.2 as National Legal Frameworks.

Table 2 National Legal Frameworks

Date	Framework	Scope	Key Details/Provisions
1994	US National Environmental Policy Act (NEPA)	National (US)	Mandates federal agencies to assess the environmental effects of their proposed actions before making decisions, promoting informed decision-making. [23]

[16] European Union (Regulation 2020/852).
[17] European Commission, "Fit for 55" Package (2021).
[18] Convention on Biological Diversity (CBD), "COP15" (2022).
[19] US Congress, Inflation Reduction Act (2022).
[20] UN Climate Ambition Summit (2023).
[21] UNFCCC COP29 (2024).
[22] European Commission, "EU Circular Economy Action Plan 2.0" (2024)
[23] National Environmental Policy Act, US Congress (1969).

Date	Framework	Scope	Key Details/Provisions
2008	Green Economy Strategy (Kenya)	National (Kenya)	Aimed at promoting sustainable economic growth, this strategy emphasizes the transition to a low-carbon, resource-efficient economy through sustainable practices in various sectors. [24]
2010	National Policy on Climate Change (India)	National (India)	Framework for India's climate action, focusing on adaptation, mitigation, and technology transfer, integrating sustainable development into national policy.[25]
2013	National Climate Change Action Plan (Philippines)	National (Philippines)	This action plan addresses climate change impacts, emphasizing disaster risk reduction, environmental sustainability, and integrating climate change into local planning.[26]
2014	U.S. Clean Power Plan	National (US)	Established emissions reduction targets for power plants, aiming to promote renewable energy and energy efficiency, although later repealed in 2019.[27]
2015	Nationally Determined Contributions (NDCs)	National (Various)	Every country submits its NDC under the Paris Agreement, detailing its climate action plans and emissions reduction targets to contribute to global climate goals.[28]
2019	Green New Deal (US Proposal)	National (US)	A proposal to address climate change and economic inequality, calling for a comprehensive national mobilization towards renewable energy and sustainable infrastructure.[29]
2020	National Adaptation Plan (Australia)	National (Australia)	A strategic framework to enhance the resilience of communities and ecosystems against climate change impacts, integrating adaptation measures into national policy.[30]
2021	National Strategy for a Sustainable Bioeconomy (Finland)	National (Finland)	Aimed at transitioning towards a bioeconomy by enhancing the sustainable use of renewable resources and promoting circular economy principles in various sectors.[31]

[24] Government of Kenya, "Green Economy Strategy" (2008).
[25] Government of India, "National Policy on Climate Change" (2010).
[26] Government of the Philippines, "National Climate Change Action Plan" (2013).
[27] US Environmental Protection Agency (EPA), "Clean Power Plan" (2014).
[28] UNFCCC, "Nationally Determined Contributions (NDCs)" (2015).
[29] US Congress, "Green New Deal" Proposal (2019).
[30] Government of Australia, "National Adaptation Plan" (2020).
[31] Government of Finland, "National Strategy for a Sustainable Bioeconomy" (2021).

Date	Framework	Scope	Key Details/Provisions
2021	South African Climate Change Bill	National (South Africa)	A legislative framework aimed at integrating climate change response measures into national policies and promoting sustainable development.[32]
2022	National Green Hydrogen Strategy (Germany)	National (Germany)	A framework to promote the development of hydrogen as a key element of the energy transition, supporting sustainable energy production and reducing carbon emissions. [33]
2023	Sustainable Development Goals (SDGs) Localization	National (Various)	Various countries are working on localizing the SDGs through national policies, emphasizing local action and stakeholder engagement for sustainable development.[34]
2024	U.S. Environmental Justice for All Initiative	National (US)	A commitment to advance environmental justice and promote equitable outcomes in climate policy, focusing on marginalized communities disproportionately affected by environmental hazards.[35]

Source: own work based (collection of data)

The green economy progress (gep) measurement framework

The Green Economy Progress (GEP) Measurement Framework is a methodical tool developed to assess and monitor the advancements made by countries in transitioning towards a green economy. This framework offers a structured approach for assessing how economic activities can promote sustainability while addressing environmental and social challenges.

Key Features of the GEP Framework:

1. **Integrated Assessment**: The GEP framework encompasses a wide arrange of indicators designed to measure different dimensions of sustainability, including:
   - **Resource Efficiency**: Evaluating how efficiently resources are used in economic activities.
   - **Environmental Impact**: Assessing the ecological footprint of economic practices, including emissions, waste, and biodiversity loss.
   - **Social Equity**: Measuring the fairness of economic opportunities and outcomes across different segments of society[36].
2. **Policy Coherence**: The GEP framework encourages coherence between various national policies and international agreements. By promoting integrated approaches, it ensures that:
   - Economic, environmental, and social policies do not conflict.

[32] Government of South Africa, "Climate Change Bill" (2021).
[33] Federal Ministry for Economic Affairs and Energy (Germany), "National Green Hydrogen Strategy" (2022).
[34] UN Development Programme (UNDP), "Sustainable Development Goals Localization" (2023).
[35] U.S. Environmental Protection Agency (EPA), "Environmental Justice for All Initiative" (2024).
[36] United Nations Environment Programme (UNEP). (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. Retrieved from UNEP.

- Different levels of government (local, regional, national) work towards common sustainability goals[37].

3. **Benchmarking and Reporting**: Countries using the GEP framework can benchmark their performance against peers, allowing for:
   - Identification of best practices and innovative approaches in green economy initiatives.
   - Regular reporting based on GEP indicators, which tracks progress over time and promotes accountability among stakeholders[38].
4. **Guidance for Policymaking**: The GEP framework serves as a valuable resource for policymakers by providing:
   - Evidence-based insights that inform the design and implementation of laws and regulations aimed at promoting sustainable economic practices.
   - Identification of gaps and challenges in current legal frameworks, helping governments to craft more effective and comprehensive policies[39].
5. **Global Context**: The GEP framework aligns with and supports with international sustainability initiatives, including:
   - The **United Nations Sustainable Development Goals (SDGs)**, which aim to address global challenges such as poverty, inequality, and climate change[40].
   - The **Paris Agreement**, which commits nations to limit global warming and adapt to climate impacts. The GEP helps facilitate global cooperation by providing a common set of metrics for evaluating progress toward shared sustainability objectives[41].

The Green Economy Progress Measurement Framework is an essential tool that supports countries in their transition to sustainable economic practices. By offering a structured methodology for evaluation and reporting, the GEP framework corroborate the development of robust legal and institutional frameworks necessary for raising a green economy.

Legal challenges in the green economy

The path to a green economy is filled with legal challenges that originate from various sources, including policy fragmentation, enforcement weaknesses, financial limitations, and socio-political barriers[42]. Understanding these challenges is essential for policymakers, legal practitioners, and stakeholders to devise effective strategies that overcome impediments and facilitate sustainable development. As illustrated in table 3 as Legal challenges in Green Economy.

[37] OECD. (2013). Green Growth Indicators 2013. Retrieved from OECD.
[38] United Nations Development Programme (UNDP). (2015). The 2030 Agenda for Sustainable Development. Retrieved from UNDP.
[39] World Resources Institute. (2019). Global Resources Outlook 2019: Natural Resources for the Future We Want. Retrieved from WRI.
[40] United Nations. (2015). Transforming our World: The 2030 Agenda for Sustainable Development. Retrieved from UN.
[41] United Nations Framework Convention on Climate Change (UNFCCC). (2015). The Paris Agreement. Retrieved from UNFCCC.
[42] Organisation for Economic Co-operation and Development (OECD). "Environmental Policy and Sustainable Development." Retrieved from OECD Environment.

Table 3 Legal Challenges in the Green Economy

Category	Challenge	Details	Impact
Policy Coherence and Integration	Fragmented Policies[43]	Environmental laws operate in isolation from economic and social policies.	Conflicting objectives hinder comprehensive sustainability progress.
Enforcement and Compliance	Weak Enforcement Mechanisms[44]	Limited monitoring, high corruption, inadequate penalties.	High non-compliance rates, environmental degradation.
Economic and Financial Constraints	High Initial Costs and Limited Funding[45]	Significant upfront investments required, misaligned economic incentives.	Slowed adoption of green technologies, limited project implementation.
Technological and Innovation Barriers	Regulatory Uncertainty and IP Issues[46]	Laws lag behind technological advances, strict IP protections limit innovation.	Reduced investment in green technologies, slower innovation rates.
Political and Institutional Challenges	Changing Political Agendas and Weak Institutions[47]	Frequent policy shifts, inadequate institutional capacity.	Disrupted green initiatives, inconsistent policy implementation.
International Coordination and Standards	Divergent International Standards and Trade Conflicts[48]	Varied national standards, conflicts between trade and environmental policies.	Challenges in international cooperation, barriers to green trade.
Legal Frameworks Lagging Behind Technology	Inadequate Adaptation of Laws to Emerging Technologies[49]	Slow legislative response to technological advancements.	Legal gaps, increased uncertainty for green tech investments.
Social and Equity Concerns	Ensuring Just Transitions and Social Equity[50]	Displacement of workers, unequal access to green benefits.	Increased social inequalities, resistance to green policies.

[43] United Nations Environment Programme (UNEP). "Green Economy Report." Retrieved from UNEP Green Economy.
[44] Organisation for Economic Co-operation and Development (OECD). "Environmental Policy and Sustainable Development." Retrieved from OECD Environment.
[45] European Environment Agency (EEA). "Policy Coherence for Sustainable Development." Retrieved from EEA Policy Coherence.
[46] International Renewable Energy Agency (IRENA). "Renewable Energy Costs." Retrieved from IRENA Renewable Costs.
[47] International Labour Organization (ILO). "Just Transition." Retrieved from ILO Just Transition.
[48] World Trade Organization (WTO). "Trade and Environment." Retrieved from WTO Trade and Environment
[49] Brookings Institution. "Blockchain and Environmental Sustainability." Retrieved from Brookings Blockchain
[50] United Nations Sustainable Development Goals (SDGs). Goal 10: Reduced Inequalities. Retrieved from UN SDG Goal 10.

Category	Challenge	Details	Impact
Conflicts with Existing Laws	Overlapping and Conflicting Regulations[51]	Legal ambiguities between new and pre-existing laws.	Legal uncertainty, implementation delays.
Unclear or Ambiguous Legislation	Vague Definitions and Lack of Specificity[52]	Inconsistent enforcement due to unclear legal language.	Varied interpretations, reduced effectiveness of green policies.
Resistance from Stakeholders	Opposition from Industries and Public[53]	Lobbying against regulations, economic interests in maintaining status quo.	Delayed or weakened green regulations, reduced policy effectiveness.
Capacity and Expertise Limitations	Limited Legal and Institutional Capacity[54]	Insufficient technical expertise, inadequate resources for enforcement agencies.	Ineffective implementation and enforcement of green laws.

Source: own work based (collection of data)

The table 4 illustrates the regional Legal challenges.

Table 4 Legal Challenges by Region

Region	Challenge	Example	Impact
North America	Resistance from Stakeholders[55]	Fossil fuel industry lobbying against carbon pricing in the United States.	Delay in implementing effective carbon pricing mechanisms, continued high emissions.
Europe	Policy Coherence and Integration[56]	Conflicts between EU agricultural policies and environmental sustainability goals.	Inefficient use of land resources, reduced biodiversity despite strong environmental laws.
Asia	Enforcement and Compliance[57]	Weak enforcement of environmental regulations in	Severe air and water pollution, undermining public health and environmental sustainability.

[51] Environmental Law Reporter (ELR). "Resolving Regulatory Conflicts." Retrieved from ELR Regulatory Conflicts.
[52] United Nations Environment Programme (UNEP). "Clarity in Environmental Legislation." Retrieved from UNEP Clarity Legislation.
[53] Environmental Defense Fund (EDF). "Industry Lobbying against Environmental Policies." Retrieved from EDF Lobbying.
[54] World Bank. "Environmental Governance in Developing Countries." Retrieved from World Bank Environmental Governance.
[55] International Energy Agency (IEA). "Fossil Fuel Industry and Policy Resistance." Retrieved from IEA Fossil Fuel Resistance.
[56] European Environment Agency (EEA). "Policy Coherence for Sustainable Development." Retrieved from EEA Policy Coherence.
[57] United Nations Environment Programme (UNEP). "Environmental Enforcement in Developing Countries." Retrieved from UNEP Enforcement.

Region	Challenge	Example	Impact
		rapidly industrializing countries like India and China.	
Africa	Capacity and Expertise Limitations[58]	Limited institutional capacity to implement and enforce complex environmental laws in Sub-Saharan Africa.	Ineffective policy implementation, persistent environmental degradation despite legislative efforts.
Latin America	International Coordination and Standards[59]	Deforestation in the Amazon conflicting with international climate agreements.	Loss of biodiversity, increased greenhouse gas emissions, strained international relations.
Middle East	Economic and Financial Constraints[60]	High dependency on oil revenues limiting investments in renewable energy.	Slowed transition to renewable energy, continued reliance on fossil fuels.
Global	Legal Frameworks Lagging Behind Technology[61]	Inadequate regulations for emerging technologies like blockchain in carbon trading.	Increased legal uncertainty, limited adoption of innovative green technologies.
Global	Social and Equity Concerns[62]	Unequal access to green technologies and benefits across different socio-economic groups worldwide.	Increased social inequalities, resistance to global green initiatives.

Source: own work based (collection of data)

The transition to a green economy is essential for sustainable development, but it is accompanied by a range of legal challenges. These challenges include fragmented policies, weak enforcement mechanisms, financial constraints, technological barriers, political instability, lack of international coordination, outdated legal frameworks, social equity concerns, conflicting regulations, ambiguous legislation, stakeholder resistance, and limited institutional capacity. Addressing these challenges requires comprehensive and adaptive legal strategies that enhance policy coherence, strengthen enforcement, secure adequate funding, foster technological innovation, ensure social equity, and promote international cooperation. By tackling these legal obstacles, policymakers and stakeholders can create robust frameworks that facilitate the effective implementation of green economy initiatives, ultimately contributing to a sustainable and resilient future.

[58] World Bank. "Strengthening Institutional Capacity for Sustainable Development." Retrieved from World Bank Institutional Capacity
[59] **Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). "Implementation of the Paris Agreement." Retrieved from UNFCCC Paris Agreement.**
[60] International Monetary Fund (IMF). "Subsidy Reforms for Sustainable Growth." Retrieved from IMF Subsidy Reforms.
[61] International Renewable Energy Agency (IRENA). "Microgrid Deployment and Regulation." Retrieved from IRENA Microgrid Regulation.
[62] United Nations Sustainable Development Goals (SDGs). Goal 10: Reduced Inequalities. Retrieved from UN SDG Goal 10.

Recommendations

To effectively strengthen the legal frameworks of a green economy within the context of the **Green Economy Progress (GEP) measurement framework**, it is essential to adjust each Recommendation with the specific GEP indicators. The GEP framework evaluates a nation's transition to a green economy based on indicators such as resource efficiency, social inclusivity, natural capital protection, economic sustainability, environmental health, innovation, and governance. Table 5 illustrates the recommendations with GEP (Green economy progress) indicators.

Table 5 Recommendations

GEP Measurement Indicators	Legal Framework Recommendations	Description and Impact
1.Resource Efficiency andcircularity	1.Establish Comprehensive Green Economy Laws and Policies	Holistic Green Economy Laws encompass environmental protection, social equity, and economic sustainability, setting clear, time-bound targets across sectors such as renewable energy, waste management, and water conservation. This alignment ensures comprehensive progress in resource efficiency and circularity, directly impacting GEP's material use and resource productivity indicators.[63]
	2.Incorporate Circular Economy Principles Into Legal Frameworks	Circular Economy Legislation promotes waste reduction, recycling, and resource efficiency by enforcing the principles of reduce, reuse, and recycle. Extended Producer Responsibility (EPR) mandates producers to manage the entire lifecycle of their products, thereby enhancing recycling rates and minimizing waste, aligning with GEP's resource efficiency indicators.[64] [65]
2. Natural Capital and Ecosystem Protection	3. Enforce Biodiversity and Ecosystem Protection Laws	Conservation and Protected Areas Laws protect biodiversity and natural habitats through legal designations of protected areas, fines for deforestation, and regulations against ecosystem disruption. Enhanced Environmental Impact Assessments (EIAs) ensure that all projects undergo rigorous environmental scrutiny, preserving natural capital and aligning with GEP's ecosystem health indicators.[66] [67]

[63]Comprehensive Green Economy Laws: United Nations Environment Programme (UNEP). "Green Economy Report

[64] Circular Economy Legislation: European Commission. "Closing the Loop – An EU Action Plan for the Circular Economy."

[65] Extended Producer Responsibility (EPR): Ellen MacArthur Foundation. "The Circular Economy in Detail."

[66]Conservation and Protected Areas Laws: United Nations Environment Programme (UNEP). "Global Environment Outlook (GEO)

[67] Enhanced Environmental Impact Assessments (EIAs): United States Environmental Protection Agency (EPA). "Environmental Impact Assessment (EIA)

GEP Measurement Indicators	Legal Framework Recommendations	Description and Impact
	4. Strengthen Environmental Rights and Access to Justice	Codify Environmental Rights in Constitutions to empower citizens to hold governments and corporations accountable for environmental degradation. Expand Access to Environmental Justice by enhancing mechanisms for environmental litigation and supporting public interest lawsuits, ensuring that vulnerable communities benefit from ecosystem protection. [68][69]
3. Social Equity and Inclusivity	5. Promote Social Equity through Legal Protections	Green Jobs Legislation supports the creation of green jobs, ensuring fair wages and labor rights in sustainable sectors. Support Vulnerable Communities by mandating that green economy policies prioritize marginalized groups, providing access to renewable energy, green infrastructure, and social protection during transitions from polluting industries.[70] [71]
	6. Strengthen Access to Environmental Justice	Legal Frameworks for Environmental Justice ensure that communities disproportionately affected by environmental harm have legal avenues to seek redress, enhancing social inclusivity and equity in the green economy transition.[72]
4. Economic Sustainability	7. Develop Green Fiscal Policies	Carbon Pricing and Taxation Laws internalize the environmental costs of emissions through carbon taxes or cap-and-trade systems, promoting low-carbon investments. Subsidy Reforms phase out subsidies for harmful industries and redirect financial support towards renewable energy and green agriculture, enhancing economic sustainability.[73] [74]
	8. Legalize Green Finance and Investment	Green Bonds Legislation regulates the issuance of green bonds to finance sustainable projects. Sustainable Investment Mandates require financial institutions to incorporate ESG criteria into their investment strategies, fostering green investments and reducing exposure to environmentally risky assets, thereby supporting economic sustainability.[75] [76]

[68] Codify Environmental Rights: Bullard, Robert D. Environmental Justice: Grassroots Activism and Its Impact on Public Policy in America.
[69] Access to Environmental Justice: Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.
[70] Green Jobs Legislation: International Labour Organization (ILO). "Green Jobs and Decent Work."
[71] Support Vulnerable Communities: United Nations Sustainable Development Goals (SDGs). Goal 10: Reduced Inequalities
[72] Environmental Justice Frameworks: Health and Environment Alliance (HEAL). "Environmental Justice
[73] Carbon Pricing and Taxation Laws: World Bank. "State and Trends of Carbon Pricing."
[74] Subsidy Reforms: International Monetary Fund (IMF). "Subsidy Reforms for Sustainable Growth."
[75] Green Bonds Legislation: International Capital Market Association (ICMA). "Green Bond Principles."
[76] Sustainable Investment Mandates: Principles for Responsible Investment (PRI). "What are ESG Criteria?"

GEP Measurement Indicators	Legal Framework Recommendations	Description and Impact
5. Environmental Health	9. Enhance Pollution Control and Public Health Legislation	Pollution Control Laws set stringent emission standards for air, water, and soil pollution, promoting clean technologies and ensuring access to clean water and sanitation. Clean Energy Laws mandate the transition to renewable energy sources, improving air quality and reducing health impacts associated with pollution, directly aligning with GEP's environmental health indicators.[77] [78]
6. Innovation and Technology	10. Integrate Technology and Innovation in Green Legal Frameworks	Laws on Clean Technology Innovation promote R&D in green technologies through funding, tax incentives, and intellectual property protections. Data and Digital Monitoring Laws mandate the use of digital technologies for real-time environmental monitoring, enhancing transparency and regulatory enforcement, thus fostering innovation.[79] [80]
7. Governance and Institutional Capacity	11. Enhance International Legal Cooperation on Green Economy	Harmonize International Green Economy Standards by aligning national laws with global standards on trade, environmental protection, and technology transfer. Green Trade Agreements embed sustainability clauses in trade deals, ensuring environmental standards are upheld and promoting international collaboration.[81] [82]
	12. Strengthen Corporate Accountability and Sustainability Reporting	Mandatory Sustainability Reporting requires corporations to disclose their environmental and social impacts using standardized metrics, enhancing transparency. Corporate Governance for Sustainability integrates sustainability goals into corporate governance structures, ensuring long-term accountability and alignment with GEP indicators.[83] [84]
8. Economic Diversification and Resilience	13. Promote Social Equity through Legal Protections	Green Jobs Legislation and Support for Vulnerable Communities ensure economic diversification by fostering job creation in sustainable sectors and reducing dependence

[77] Pollution Control Laws: United States Environmental Protection Agency (EPA). "Clean Air Act."
[78] Clean Energy Laws: National Renewable Energy Laboratory (NREL). "Renewable Energy Policies and Laws."
[79] Laws on Clean Technology Innovation: International Renewable Energy Agency (IRENA). "Policies for Innovation."
[80] Data and Digital Monitoring Laws: European Union. "EU Digital Strategy."
[81] Harmonize International Green Economy Standards: Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC).
[82] Green Trade Agreements: World Trade Organization (WTO). "Trade and Environment."
[83] Mandatory Sustainability Reporting: Global Reporting Initiative (GRI). "Sustainability Reporting Standards."
[84] Corporate Governance for Sustainability: Organization for Economic Co-operation and Development (OECD). "Corporate Governance and Sustainability."

GEP Measurement Indicators	Legal Framework Recommendations	Description and Impact
		on polluting industries, enhancing economic resilience and aligning with GEP's diversification indicators.[85] [86]
	14. Foster Sustainable Employment and Green Jobs	Laws Supporting Sustainable Employment prioritize green job creation, provide incentives for businesses to offer decent work conditions, fair wages, and opportunities for skill development in green industries, thus promoting economic resilience and diversification.[87]

Source: own work based (collection of data)

Coordinate the **14 legal framework recommendations** with the **Green Economy Progress (GEP) measurement framework** ensures that each legislative action contributes directly to the measurable indicators of green economy advancement. This comprehensive alignment facilitates effective monitoring, accountability, and continuous improvement in transitioning towards a sustainable, inclusive, and resilient green economy. The utilization of this detailed mapping to implement and evaluate legal measures that drive meaningful progress in queue with both national and global sustainability objectives.

Conclusion

The shift towards a green economy is a crucial effort aimed at balancing economic growth with environmental sustainability and social inclusiveness. However, existing legal frameworks, both nationally and internationally, face multiple challenges in fully realizing this transformation. These challenges include fragmented policies, weak enforcement mechanisms, lack of coordination across sectors, and insufficient capacity to adapt to rapidly evolving green technologies. Moreover, conflicting trade and environmental regulations across borders hinder a global green transition.

At the national level, countries must refine their legal systems to ensure comprehensive integration of sustainability principles across sectors. This includes revising outdated laws, promoting green innovation, and addressing social equity concerns. Strong legal backing is necessary for a smooth transition that not only mitigates environmental degradation but also ensures that communities, particularly vulnerable ones, benefit from the opportunities created by the green economy.

On the international stage, harmonizing regulations is critical for addressing transboundary environmental concerns such as climate change, biodiversity loss, and resource depletion. Without international cooperation and alignment on key green economy metrics, progress will remain uneven. Global frameworks, such as the Paris Agreement and the Green Economy

[85] Economic Diversification through Green Jobs: International Labour Organization (ILO). "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World."
[86] Support for Vulnerable Communities: United Nations Environment Programme (UNEP). "Environmental Justice and Sustainable Development."
[87] Laws Supporting Sustainable Employment and Green Jobs: International Labour Organization (ILO). "Promoting Decent Work in Green Sectors."

Progress (GEP) Measurement Framework, provide valuable guidance but need to be continuously updated to address emerging challenges like technological disruption, changing political landscapes, and trade tensions. These frameworks underline the importance of robust legal and regulatory mechanisms that encourage sustainability across all sectors of the economy.

The GEP Measurement Framework emphasizes that progress towards a green economy requires not only economic and environmental performance but also legal structures that ensure inclusivity, transparency, and accountability. This framework helps countries assess their progress and identifies gaps in their legal infrastructure, providing a roadmap for necessary reforms. The 14 recommendations outlined provide a comprehensive pathway for strengthening legal frameworks to support sustainable economic growth, environmental protection, and social equity. The legal frameworks are flexible enough to adapt to technological advancements, inclusive enough to support vulnerable populations, and robust enough to ensure long-term ecological sustainability. The legal architecture of the green economy, combined with international cooperation, will ultimately determine the success of global efforts to achieve a sustainable, resilient, and inclusive future.

References

1. Adams, R.J. (2018). International environmental law and the green economy: Principles and challenges. New York: Routledge.
2. Brown, T., & Lee, M. (2019). National legal frameworks for sustainable development: An analysis of green economy policies. Journal of Environmental Law, 21(2), 145-167.
3. Clark, P.D. (2020). The role of national governments in advancing the green economy. International Journal of Environmental Policy, 35(1), 35-52.
4. Jackson, M. (2022). The legal structures of a sustainable economy: National and international approaches (3rd ed.). London: Oxford University Press.
5. OECD. (2020). The green economy transition: Global and national regulatory frameworks. Paris: OECD Publishing.
6. Green Economy Coalition. (2021). Green economy progress measurement framework: A review. Retrieved from https://www.greeneconomycoalition.org/reports/GEP-framework-review
7. United Nations Environment Programme (UNEP). (2019). The global green economy: Legal and institutional perspectives. Retrieved from https://www.unep.org/global-green-economy-legal-frameworks
8. World Bank. (2023). Legal frameworks for a green transition: Global insights. Retrieved from https://www.worldbank.org/green-transition-legal-frameworks
9. European Commission. (2021). The EU green deal: Legal frameworks and policy developments. Retrieved from https://ec.europa.eu/green-deal/legal-frameworks
10. United Nations Framework Convention on Climate Change (UNFCCC). (2020). National frameworks for climate action and the green economy. Retrieved from https://unfccc.int/climate-action/green-economy
11. International Institute for Sustainable Development (IISD). (2022). Green economy and international legal frameworks: A comparative review. Retrieved from https://www.iisd.org/green-economy-international-legal-frameworks
12. World Economic Forum (WEF). (2020). Global legal frameworks driving the green economy. Retrieved from https://www.weforum.org/green-economy-legal-frameworks
13. United Nations Conference on Trade and Development (UNCTAD). (2021). Legal and regulatory challenges in the green economy transition. Retrieved from https://unctad.org/green-economy-legal-challenges
14. International Labour Organization (ILO). (2019). Green jobs and national legal frameworks for the green economy. Retrieved from https://www.ilo.org/green-jobs-legal-frameworks
15. OECD. (2021). National legal strategies for green growth and sustainable development. Retrieved from https://www.oecd.org/green-growth-legal-strategies
16. UN Environment Programme (UNEP). (2020). Green economy: Legal tools and instruments for a sustainable future. Retrieved from https://www.unep.org/green-economy-legal-tools
17. Green Growth Knowledge Partnership (GGKP). (2021). Green economy progress and national legal frameworks. Retrieved from https://www.greengrowthknowledge.org/green-economy-legal-frameworks

18. United Nations Development Programme (UNDP). (2019). Legal and institutional frameworks for sustainable development and the green economy. Retrieved from https://www.undp.org/legal-frameworks-green-economy
19. International Renewable Energy Agency (IRENA). (2021). Legal frameworks for renewable energy in the green economy transition. Retrieved from https://www.irena.org/legal-frameworks-renewable-green-economy
20. World Resources Institute (WRI). (2020). Green economy progress: National and international legal perspectives. Retrieved from https://www.wri.org/green-economy-legal-perspectives
21. The International Bar Association (IBA). (2022). Environmental law and the green economy: Global legal developments. Retrieved from https://www.ibanet.org/green-economy-legal-developments
22. Climate Policy Initiative (CPI). (2021). Legal aspects of financing the green economy transition. Retrieved from https://www.climatepolicyinitiative.org/green-economy-financing-legal-aspects

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DIGITAL COMMUNICATION TRANSFORMATION: IMPACT ON UNDERGRADUATE STUDENTS IN THE PLATFORM ECONOMY

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Abstract: Digital communication transformation influences both our communication habits and organizational structures of enterprises because nowadays digital communication represents the main element of human interactions and economic activities. After the pandemic, the role of digital communication in education has become crucial due to the forced transition to Education 4.0 paradigm generated by the 2021 lockdown. The main purpose of this study is to examine the influence of digital communication transformations on undergraduate students, as well as to understand how these changes affect students' personal and academic communication. The methodological approach of this research paper applies a qualitative perspective by the means of an online survey disseminated to students (n=167) from the Bucharest University of Economic Studies. Findings of this survey reveal the profound impact of digital communication transformation on undergraduate students' habits and perceptions. Additionally, the results of this study suggest that digital communication facilitates more frequent and efficient interactions with both peers and professors, which enhance academic and personal engagement. Main conclusion of this research article suggest that digital communication instruments play a central role in Education 4.0 and must be adopted by all educational institutions with the aim of equipping students with digital skills that are mandatory in the digital era. Further research should focus on examining the effects of certain digital tools on students' academic performance and motivation, as well as on the impact of digital communication on the development of critical thinking and problem-solving skills.
Keywords: digital communication, Education 4.0, digital skills, undergraduate students, online survey.
JEL Classification: O33, I23, Z18

1 Introduction

Digital transformation of recent decades has severely reshaped the way people communicate, socially interact or make business. If digital transformations have taken over all organizational fields and have fundamentally changed people's habits (Berman, 2012) it is evident that the

field of communication has also been affected by the metamorphosis into digital communication tools: emails, direct messaging, social media platforms, videoconference platforms etc. (Eurostat, 2022). Unfortunately, these modern changes in the ways people communicate nowadays have also numerous negative effects on teenagers. For instance, there is a negative impact of digital overload and social media addiction on academic performance, as well as on the emotional state because it generates in fact loneliness (Jabeen et al, 2023).

The massive lockdown from 2021 has created the perfect environment for the polyvalent analysis of the online learning on both students and teachers. Studies conducted during the COVID-19 pandemic on undergraduate students demonstrate that they prefer face-to-face activities that integrate digital technologies rather than using strictly digital equipment, but they also acknowledge the benefits of reduced cost of living implied by the e-learning period (Antonopoulou et al., 2023; Crew & Märtins, 2023).

After the end of the pandemic, there was a visible shift towards Education 4.0 that caught the attention of many scholars (Ahmed & Hasnine, 2023; Caccavale et al., 2024; Hoffmann et al., 2024; Mosleh et al., 2024) who were interested in examining the impact of AI and educational technology on undergraduate students and university professors.

2 Literature review

With respect to the pedagogical approach, digital technologies can be used for various methods and strategies that produce an amplification of the students' motivation and engagement during courses: collaborative learning, gamification, inquiry-based learning etc. First of all, recent studies show that the methodological framework based on digital collaborative learning not only that contributes to innovation and creativity, but also enhances academic performance and social outcomes for students (Li et al., 2023; Møgelvang et al., 2023). Secondly, the systematic review of Balalle (2024) demonstrates that applying digital gamification methods during courses significantly increases students' motivation and helps developing their digital skills. Similarly, many other scholars have investigated the effects of digital technologies on undergraduate students (Hanaysha et al., 2023; Smoląg et al., 2023; Narmaditya et al., 2024) and on teachers (Bourlakis et al., 2023).

On one hand, the research article of Bourlakis et al. (2023) proves that the amplification of pedagogical approaches caused by the expansion of educational activities into online settings has a profound negative effect on the increased level of technostress manifested by teachers who feel unable to keep up with the constant multiplication of educational platforms and applications that emerge daily. On the other hand, studies of Hanaysha et al. (2023) and Narmaditya et al. (2024) show that teachers' level of digital skills are strongly correlated with the development of students' digital skills and academic performance, while social media consumption has no effect on the development of students' digital competencies (Smoląg et al., 2023).

It is very important to highlight the fact that many researchers (Ahmed & Hasnine, 2023; Caccavale et al., 2024; Hoffmann et al., 2024; Mosleh et al., 2024) agree that popular chatbots like Chat GPT cannot be reliable due to very many reasons, but course-specific chatbots can develop students' wellbeing because they are in fact large language models (LLMs) able to

personalize each students' learning experience using their inputs. For example, the research article of Caccavale et al. (2024) demonstrates that virtual tutors could substitute chemical engineering teachers, even if virtual tutors are not real people, but only chatbots based on LLMs. Consequently, the meticulous analysis of the scientific literature in the field of economics of education and more specifically in the realm of digital education has permitted the identification of the following research hypotheses:

H.1. Digital communication transformation positively affects the academic information efficiency and accessibility.

H.2. Digital educational tools raise health concerns and negatively impact students' mental health.

3 Methodology

The main aim of this research paper is to identify the impact of digital communication transformations on the undergraduate students (n=167) from the Bucharest University of Economic Studies. Hence, the research is guided by the following research questions:

RQ1: How does digital communication transformation affect information accessibility and efficiency among students?

RQ2: What are the socio-psychological challenges caused by the digital instruments adoption for the academic communication?

In order to answer these questions, the methodological approach used is mainly qualitative and implies an online survey based on a Google Forms questionnaire. Responses were collected between 23 and 30 of May 2024 and the questionnaire was disseminated via institutional platforms.

Next, data was processed and analysed using Excel, after all collected data were exported from Google Forms. After data cleaning, 167 valid responses were retained.

4 Findings

Figure 1 presents the gender and age profile of the respondents, with 63.5% of the participants being females and 85% of them aged 20 to 22. The young age of the survey participants includes this population category into the digital natives and influences their perception towards digital communication.

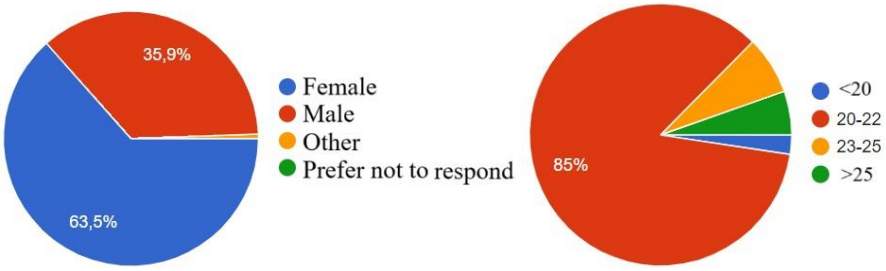

Figure 1: Participants distribution according to their gender (left, %) and age (right, %)

Source: authors' contribution.

Next, Figure 2 shows the respondents distribution on faculties and year of study, with the majority of the participants from the Faculty of Agrifood and Environmental Economics (51%), followed by the students from the Faculty of Management (17%). With regards to the year of study, most of the participants are enrolled in the second (52%) and the third year of study (29%), which confirms their experience with all the digital communication transformations implemented by the Bucharest University of Economic Studies over the period of 2021-2024.

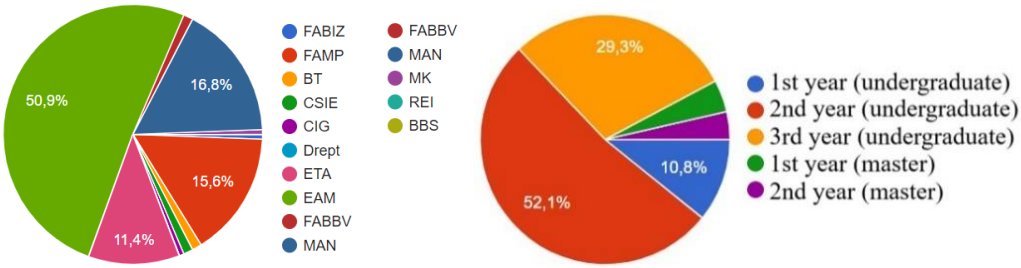

Figure 2: Participants distribution according to their faculty (left) and year of study (right, %)

Source: authors' contribution.

In addition, Figure 3 indicates the frequency of different social platforms utilization by the students questioned in this study when they were engaged in educational activities.

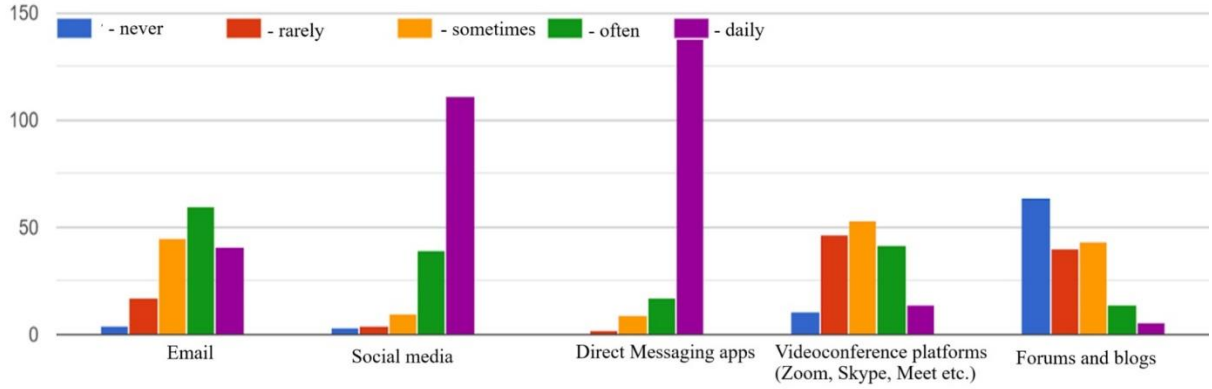

Figure 3: Frequency of different social platforms utilization for academic purpose (%)

Source: authors' contribution.

According to Figure 3, the most utilized platforms are WhatsApp (83%) and Facebook (66%), followed by blogs (38%), and email (36%). These results indicate students' preference towards accessing social platforms that offer both direct messaging and socializing functions.
Moreover, Figure 4 illustrates that most of the participants (54%) declared to use social platforms when engaging in academic communication activities, while 38% of them preferred direct messaging applications, and only 6% of students have chosen the email.

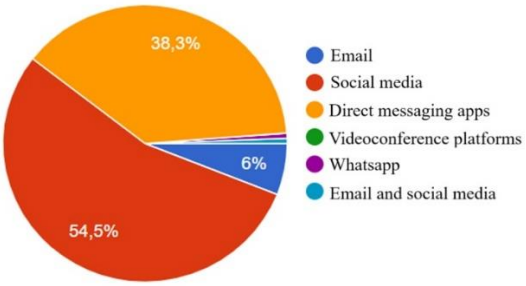

Figure 4: Digital communication tools' preference for academic purpose (%)

Source: authors' contribution.

Next, Figure 5 presents the students' perception towards academic communication improvement due to digital transformation, with 53% of them having declared that digital transformation significantly improved communication, while 30% consider that communication has only been moderately improved, and 17% have seen no improvement. Consequently, students' perception towards digitalization's impact over academic communication seems to be rather positive than negative.

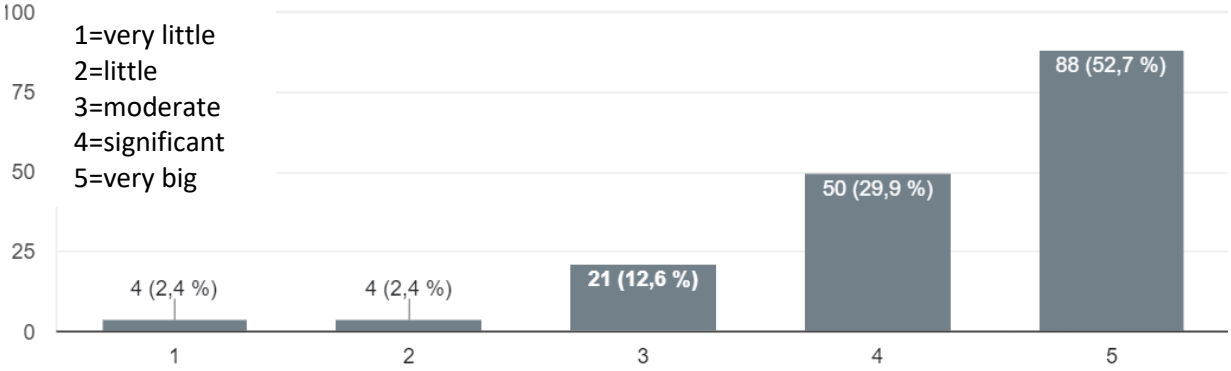

Figure 5: Academic digital communication improvement scale as perceived by students (%)

Source: authors' contribution.

Furthermore, Figure 6 analyzes which communicational aspects have already been improved by digital transformation. Most of the participants declared that the quick speed (84.4%) and accessibility (80.2%) are the main communicational aspects improved by digital technologies. However, Figure 6 demonstrates that participants in this study have also observed other important aspects of the academic communication improved by digital instruments: collaboration (47.9%), clarity (40.7%), and feedback (35.9%).

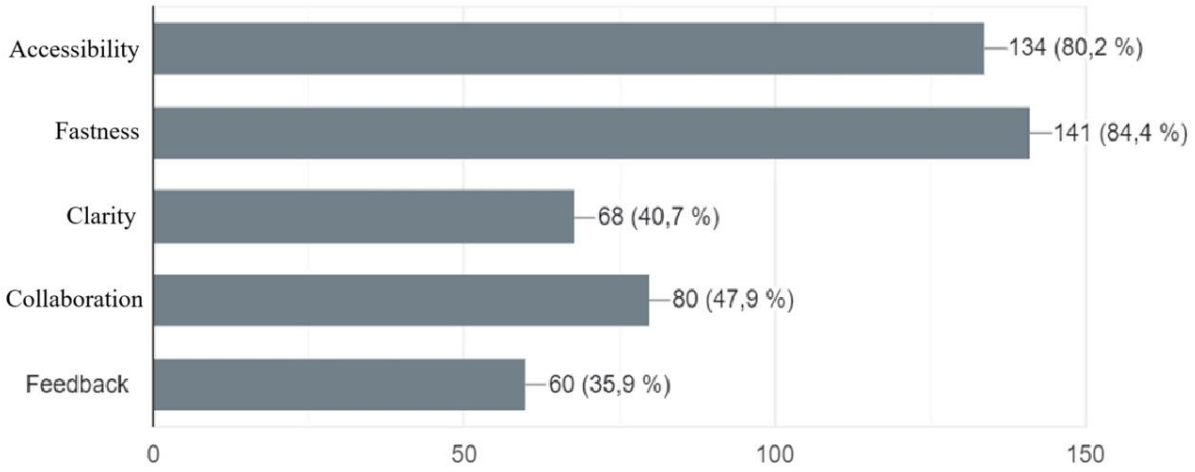

Figure 6: Aspects of academic communication improved by digital transformation (%)

Source: authors' contribution.

Nonetheless, academic digital communication also presents many challenges determined by the digital technologies dependence (Figure 7). The main challenges reported by the participants in this study are: technical difficulties (59%), misunderstandings (49%), and lack of direct interaction (41%). Other challenge indicated by the respondents is digital overload (20%), while only 3 persons declared a lack of obstacles in digital communication. Overall, these challenges highlight the need for more robust technical solutions implementation, as well as for efficient digital interaction management strategies.

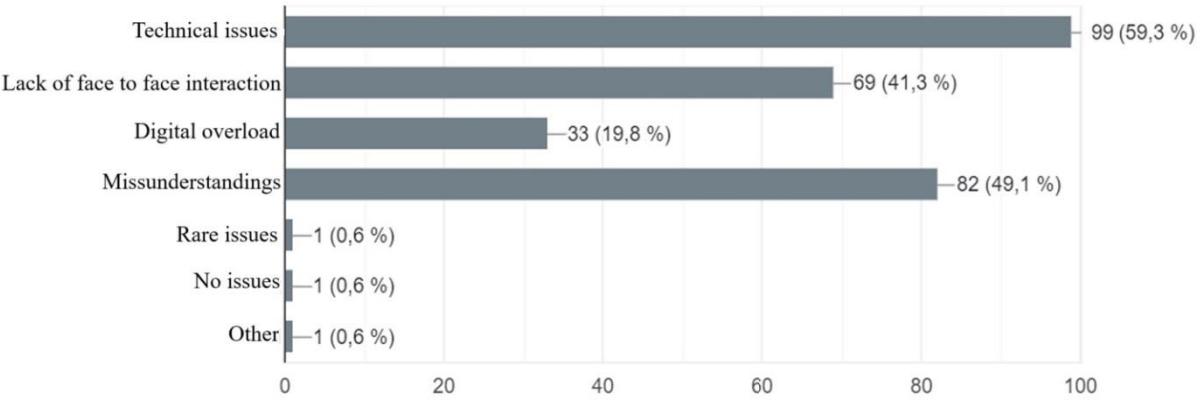

Figure 7: Challenges encountered in academic digital communication (%)

Source: authors' contribution.

Conversely, Figure 8 indicates the fact that 62% of the participants consider that digital transformation will positively impact future communication, 29% appreciate that the impact will be moderate, and another 8% are sceptic about the changes suffered by the communicational process. Hence, this overall optimistic perception suggest the fact that digital natives manifest positive expectations towards digital communication evolution.

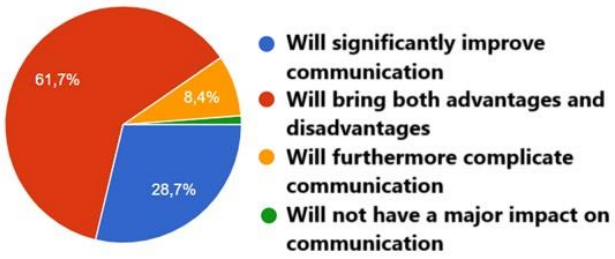

Figure 8: Students' opinion towards the impact of digital transformation over future communication (%)

Source: authors' contribution.

Next, Figure 9 analyses the appetite of digital natives for technological innovation and illustrates their preference for academic digital communication improvement that includes: integrated academic digital platforms for educational purposes (47%), artificial intelligence applications for personalized assistance (32%), and virtual reality technologies for academic use (18%). These results demonstrate students' interest for advanced technologies that have the potential to improve academic interactions and communication.

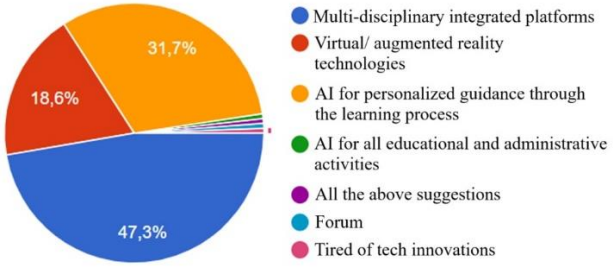

Figure 9: Tehnological innovations that may improve academic communication (%)

Source: authors' contribution.

Figure 10 presents the students' degree of satisfaction towards the technical support of digital platforms offered by the Bucharest University of Economic Studies, with 70% of the participants having declared to be extremely satisfied or very satisfied, another 26% expressed a moderate degree of satisfaction, and only 4% have manifested a high degree of dissatisfaction.

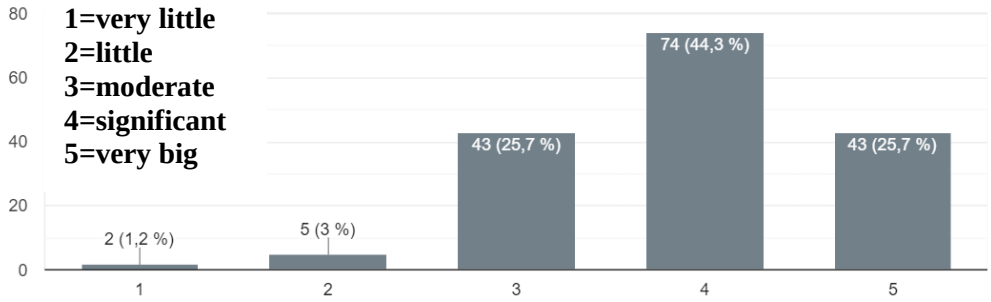

Figure 10: Students' satisfaction towards the academic technical support (%)

Source: authors' contribution.

On one hand, Figure 11 indicates that the main perceived advantage of academic digital communication is the accessibility of educational resources (65%), followed by the easiness of peers and professors collaboration (21%), and flexibility (13%). These findings suggest that digital native students prefer the efficiency and comfort brought by digital communication consumption.

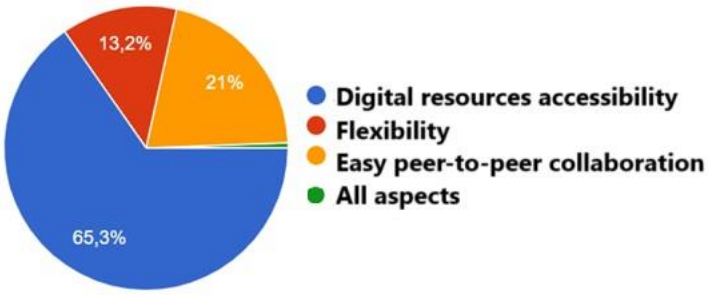

Figure 11: The main perceived advantage of academic digital communication (%)

Source: authors' contribution.

On the other hand, Figure 12 indicates that 32% of the participants believe that digital transformation have negatively impact their mental health, while 20% of the respondents consider that digital communication transformation have not affected negatively their well-being. The other half of the participants in this study appreciate that the impact of digital communication transformation was moderate, which demonstrates that students acknowledge the negative influence of digital overload on their mental health.

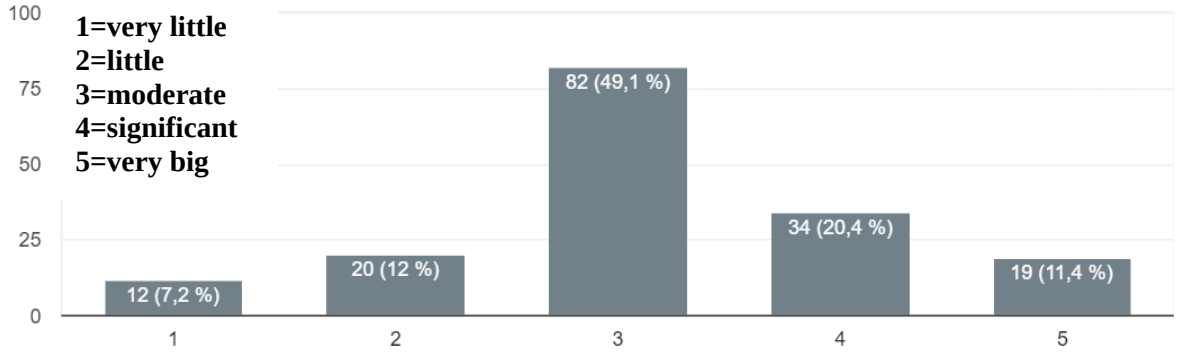

Figure 12: The impact of digital communication transformation over students' mental health (%)

Source: authors' contribution.

Furthermore, Figure 13 shows the amount of time spent by students for both academic (left pie) and personal communication (right pie) using digital platforms. Data from Figure 13 demonstrates that one third of the students (35%) uses twice less time digital communication platforms for academic purposes (1-2h) than for personal use (4h). Students' intense digital platforms consumption for 2-3 hours daily is manifested by a quarter of the participants in the survey, while 24% of them indicate an excessive use of digital communication platforms for three to four hours a day but for personal use instead of academic purposes.

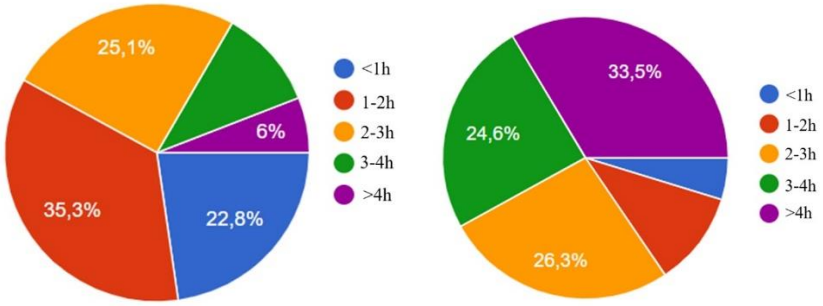

Figure 13 The amount of time spent on digital communication platforms for academic (left) and personal purpose (right, %)
Source: authors' contribution.

The last item from the survey based on questionnaire was an open question that allowed participants to express their opinion towards digital communication transformation. Based on their responses, data was classified in three clusters: positive, neutral, and negative opinions. As expected, many participants indicated positive opinions and highlighted the high accessibility and instantaneous speed of information via digital communication tools. One interesting recommendation suggested by students interviewed referred to a chatbot based on AI integrated into the academic platforms that could help answer questions, access easier the content needed or even facilitate administrative tasks.

Conversely, another student emphasized the digitalization' potential to dilute young people's abilities to interact face to face and communicate directly because youngsters prefer in their vast majority to communicate via technological environments. For this reason, digital overload can increase young population's level of anxiety and can amplify the negative perception towards traditional social interactions.

Similarly, another responses indicated that university teachers lack digital adaptability and digital skills at least as advanced as their students' level of digital competencies. For example, a frequent critique referred to the use of outdated digital educational resources by many professors, which only decrease students' level of engagement or active attention during courses.

Additionally, students also manifested concerns regarding the use of different artificial intelligence platforms that discourage the development of critical thinking, creativity, and problem-solving skills.

5 Discussion

The results of the current survey confirm the conclusions emphasised by the scientific literature with regards to digital communication transformations' impact on the young population, since the students' perception towards the impact of digitalization on communication mainly points out positive aspects such as accessibility improvement and greater speed of communication.

Nonetheless, scholars in this field of knowledge (Bourlakis et al., 2023) also trigger the alarm when discussing the challenges associated with digital transformations and related to the negative effects on youngsters' mental health. This is confirmed by 31% of the participants in this survey that signalled a very big negative effect of digital communication transformation on their wellbeing.

6 Conclusion

Despite the fact that this research paper provides important results regarding the impact of digital communication transformation on undergraduate students, there must also be acknowledged several limitations. Firstly, the sample of this study only included students from the Bucharest University of Economic Studies, which can affect the generalization of our results. Secondly, the online survey reflects exclusively the respondents' subjective perceptions, without any objective measurement of academic performance or engagement. Future studies could include several higher education institutions and apply a mixed-method approach that combines quantitative and qualitative methods.

Taken into consideration the findings of this study, most of the participants positively appreciated the technology' potential to facilitate quick access to educational resources and information, which not only responds the first research question (RQ1) of this study, but also confirms the first research hypothesis (H.1.).

Even though the digitalization' advantages are extremely numerous, this article has also identified challenging difficulties raised by the excessive use of technological tools for academic or personal communication, that sometimes lead to digital overload and even mental health issues. These conclusions answer the second research question (RQ2) of this paper that scrutinizes the socio-psychological challenges caused by the digital instruments adoption for academic communication, but in the same time it also confirms the second research hypothesis (H.2.).

This study also confirms Gen Z's preference for direct messaging applications for both academic and personal communication. For instance, WhatsApp and Facebook are the most accessed platforms for academic communication because students enjoy and are very satisfied with the accessibility and fastness of these digital platforms. Similarly, students interviewed also expressed their interest in using for educational purposes many different technological advancements that have the capability to improve academic interactions, such as chatbots based on AI that could be integrated into the digital platforms managed by the Bucharest University of Economic Studies.

The contribution of this research article in the field of knowledge is based on its main conclusion that points out the key role played by digital communication in shaping young population's habits and perception over our societies, while digital technologies continue to expand and substitute traditional methods that are no longer needed in the current digital era.

References

1. Ahmed, M. M. H., & Hasnine, M. N., 2023. Improving essential knowledge and self-efficacy in computers network course: The potential of chatbots. *Procedia Computer Science*, *225*, 3929-3937. https://doi.org/10.1016/j.procs.2023.10.388
2. Antonopoulou, K., Begkos, C., & Zhu, Z., 2023. Staying afloat amidst extreme uncertainty: A case study of digital transformation in Higher Education. *Technological Forecasting and Social Change*, *192*, 122603. https://doi.org/10.1016/j.techfore.2023.122603
3. Balalle, H., 2024. Exploring student engagement in technology-based education in relation to gamification, online/distance learning, and other factors: A systematic literature review. *Social Sciences & Humanities Open*, *9*, 100870. https://doi.org/10.1016/j.ssaho.2024.100870

4. Berman, S.J., 2012. Digital transformation: opportunities to create new business models. *Strategy & Leadership*, 40(2), pp.16-24. Disponibil la: <https://www.emerald.com/insight/content/doi/10.1108/10878571211209314/full/html>
5. Bourlakis, M., Nisar, T. M., & Prabhakar, G., 2023. How technostress may affect employee performance in educational work environments. *Technological Forecasting and Social Change*, *193*, 122674. https://doi.org/10.1016/j.techfore.2023.122674
6. Caccavale, F., Gargalo, C. L., Gernaey, K. V., & Krühne, U., 2024. Towards Education 4.0: The role of Large Language Models as virtual tutors in chemical engineering. *Education for Chemical Engineers*, *49*, 1-11. https://doi.org/10.1016/j.ece.2024.07.002
7. Crew, T., & Märtins, O., 2023. Students' views and experiences of blended learning and employability in a post-pandemic context. *Social Sciences & Humanities Open*, *8*(1), 100583. https://doi.org/10.1016/j.ssaho.2023.100583
8. Eurostat, 2022. *Skills for the digital age*. Disponibil la: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Skills_for_the_digital_age&action=statexp-seat&lang=ro#Decalajul_digital
9. Hanaysha, J. R., Shriedeh, F. B., & In'airat, M., 2023. Impact of classroom environment, teacher competency, information and communication technology resources, and university facilities on student engagement and academic performance. *International Journal of Information Management Data Insights*, *3*(2), 100188. https://doi.org/10.1016/j.jjimei.2023.100188
10. Hinostroza, J. E., Armstrong-Gallegos, S., & Villafaena, M., 2024. Roles of digital technologies in the implementation of inquiry-based learning (IBL): A systematic literature review. *Social Sciences & Humanities Open*, *9*, 100874. https://doi.org/10.1016/j.ssaho.2024.100874
11. Hoffmann, S., Lasarov, W., & Dwivedi, Y. K., 2024. AI-empowered scale development: Testing the potential of ChatGPT. *Technological Forecasting and Social Change*, *205*, 123488. https://doi.org/10.1016/j.techfore.2024.123488
12. Jabeen, F., Tandon, A., Azad, N., Islam, A. N., & Pereira, V., 2023. The dark side of social media platforms: A situation-organism-behaviour-consequence approach. *Technological Forecasting and Social Change*, *186*, 122104. https://doi.org/10.1016/j.techfore.2022.122104
13. Li, X., Chen, W., & Alrasheedi, M., 2023. Challenges of the collaborative innovation system in public higher education in the era of industry 4.0 using an integrated framework. *Journal of Innovation & Knowledge*, *8*(4), 100430. https://doi.org/10.1016/j.jik.2023.100430
14. Mosleh, S. M., Alsaadi, F. A., Alnaqbi, F. K., Alkhzaimi, M. A., Alnaqbi, S. W., & Alsereidi, W. M., 2024. Examining the association between emotional intelligence and chatbot utilization in education: A cross-sectional examination of undergraduate students in the UAE. *Heliyon*, 10(11), e31952. https://doi.org/10.1016/j.heliyon.2024.e31952
15. Møgelvang, A., Vandvik, V., Ellingsen, S., Strømme, C. B., & Cotner, S., 2023. Cooperative learning goes online: Teaching and learning intervention in a digital environment impacts psychosocial outcomes in biology students. *International Journal of Educational Research*, *117*, 102114. https://doi.org/10.1016/j.ijer.2022.102114
16. Narmaditya, B. S., Sahid, S., & Hussin, M., 2024. The linkage between lecturer competencies and students economic behavior: The mediating role of digital and economic literacy. Social Sciences & Humanities Open, 10, 100971. https://doi.org/10.1016/j.ssaho.2024.100971
17. Smoląg, K., Szajt, M., & Hajduová, Z., 2023. The use of social media by Polish and Slovak students and their digital competences. *Procedia Computer Science*, *225*, 1211-1220. https://doi.org/10.1016/j.procs.2023.10.109

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ADAPTING BUSINESSES FOR A SUSTAINABLE FUTURE – INTEGRATING ESG CRITERIA AND DIGITALIZING FINANCIAL FLOWS

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Abstract: This paper investigates the incorporation of Environmental, Social, and Governance (ESG) criteria into business practices alongside the digitalization of financial flows as essential strategies for achieving sustainable development. The study delves into the motivations driving ESG adoption, such as regulatory mandates,

stakeholder demands, and emerging market opportunities. It further examines the role of digital financial technologies in facilitating the effective implementation and continuous monitoring of ESG standards. By conducting a comparative analysis of organizations in Europe, USA, Moldova, China, the research identifies exemplary practices and common obstacles in harmonizing business strategies with ESG frameworks. The findings underscore the significance of digital tools in enhancing transparency, efficiency, and accountability within financial operations, thereby promoting the sustainable evolution of businesses. Additionally, the paper discusses policy implications and offers recommendations to cultivate an environment that supports ESG integration and fosters digital innovation in financial management. These insights provide a strategic roadmap for businesses aspiring to thrive sustainably in the future economy.
Keywords: ESG integration, climate change, sustainable development, transparency, financial accountability, green credit.
JEL Classification: G21, Q56, M14

1 Introduction

Climate change and environmental degradation are defining global challenges of our time, with long-lasting, devastating consequences and impacts on the economy and society as a whole. They require rapid and far-reaching changes, failure to address them will lead to irreversible consequences for ecosystems, agriculture, water resources, human health, and security. The states of the world are aware of the urgent need to address these challenges by upholding the provisions of the Paris Agreement (United Nations, 2015a) and the UN 2030 Agenda (United Nations, 2015c) for sustainable development, and are setting ambitious targets to do so. The UN General Assembly adopted the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs) in 2015, which gave new impetus to global efforts to achieve sustainable development (United Nations, 2015b).

ESG[88] has become central to discussions about sustainability and corporate responsibility in the global business environment. In this era of growing concerns about climate change, social justice, and good governance, integrating ESG into business strategies is crucial for a company's long-term success.

Digital transformation is one of the EU's priorities (€7.5 billion of funding for 2021-2027), as digitization will benefit society as a whole, providing new opportunities for businesses and putting people at the forefront (European Commission, 2024, European Commission, 2021a). The European Parliament is developing policies to strengthen Europe's capabilities in new digital technologies and open up new opportunities for business and consumers, as well as to support the green transition (European Parliament, 2024a) and help the EU achieve climate neutrality by 2050 as set out in the European Green Deal (European Commission, 2020, European Parliament, 2024b). The European Union (EU) has set itself an ambitious target to reduce greenhouse gas emissions by 55% by 2030. To achieve this goal, significant investment in the energy system is needed. This includes investment in renewable energy, energy infrastructure, energy efficiency, and clean technologies. The €350 billion per year is the additional amount of money that needs to be invested each year until 2030 to transform the energy system and meet the EU's climate targets (European Commission, 2021b).

The acquisition of digital skills (digital platforms, Internet of Things, cloud computing, blockchain, artificial intelligence, etc.) and professional training will help integrate ESG

[88] acronym for "Environment, Social, and Governance"

(Environmental, Social, Governance) criteria. Technologies drive production optimization, help reduce emissions and waste, increase competitive advantages, and ensure the competitiveness and sustainability of companies by bringing new services and products to the market (Mistrean, 2024a, 2024b, 2023a).

It is already well known that consumer preferences have changed drastically over the last decade and that consumers want the products and services they buy to come from companies that are ethical, do not exploit their employees and strive to reduce their negative impact on the environment (Mistrean, 2021e, 2021a, 2021b, 2021d). In this context, investing in sustainability not only helps a company to remain competitive in the marketplace, but also makes it attractive to potential investors. Another factor that puts ESG at the heart of a business's growth strategies is the constantly changing regulatory environment.

The integration of ESG (Environmental, Social, Governance) criteria and the digitalization of financial flows are two essential strategies for modern companies that want to remain competitive and sustainable (Mistrean, 2023b, 2024b). Investors are increasingly interested in companies that adopt sustainable practices, as the implementation of ESG criteria helps companies to identify and manage environmental, social, and governance risks, ensuring their long-term functional prosperity.

2 ESG

Climate change refers to long-term changes in weather conditions, including temperature, sea levels, precipitation amount and type, caused mainly by increases in the concentration of greenhouse gases in the atmosphere (due to the generation of carbon dioxide and nitrous oxide from fossil fuel burning, cutting down trees, methane (CH4) generation as a result of livestock farming, etc.) and global warming.

The effects of climate change are already visible all over the world through the increase in the planet's global temperature, which has already risen by 1.2°C compared to the pre-industrial period (according to the World Meteorological Organization report) (Statista, 2024). Climate change is causing sea levels to rise, floods to occur, and extreme weather events (storms, droughts, heat waves, forest fires, etc.) are increasing in frequency and magnitude (International Energy Agency, 2023).

Climate change risks are already accelerating and materializing. The intensification of extreme weather events affecting the economy of the Republic of Moldova and in Europe in general has highlighted the increasing likelihood and severity of losses associated with physical risks. At the same time, the disruption of the energy market caused by the Russian-Ukrainian war has further emphasized the need for Europe to maintain its momentum in transitioning to renewable energy and reducing Europe's dependence on fossil fuels from Russia in the short term and accelerating the energy transition (resulting from the need to manage the climate crisis) (REPowerEU, 2022).

Governments around the world are making concerted efforts to mitigate the impacts of climate change, but development budgets for financing infrastructure changes are insufficient to ensure the economic transition to new low-carbon standards. Because of this, the focus is on private finance that needs to be mobilized and banks will be the key pillar that will facilitate and safeguard this transition (Mistrean, 2022, 2021c).

Investing is no longer limited to seeking a good return at an acceptable risk. It now includes a third concept: sustainable investment, which contributes to an environmental or social objective and requires the companies in which it invests to follow good governance practices (ESG - Environment, Social, and Governance).

Table 1 The most severe 10 risks on a global scale over the next 10 years

Risk categories			
	2022	**2023**	**2024**
1.	Climate action failure	Failure to mitigate climate change	Extreme weather events
2.	Extreme weather	Failure of climate-change adaptation	Critical change to Earth systems
3.	Biodiversity loss	Natural disasters and extreme weather events	Biodiversity loss and ecosystem collapse
4.	Social cohesion erosion	Biodiversity loss and ecosystem collapse	Natural resource shortages
5.	Livelihood crises	Large-scale involuntary migration	Misinformation and disinformation
6.	Infectious diseases	Natural resource crises	Adverse outcomes of AI technologies
7.	Human environmental damage	Erosion of social cohesion and societal polarization	Involuntary migration
8.	Natural resource crises	Widespread cybercrime and cyber insecurity	Cyber insecurity
9.	Debt crises	Geoeconomic confrontation	Societal polarization
10.	Geoeconomic confrontation	Large-scale environmental damage incidents	Pollution

Legend:

Risc categories:	Economic	Environmental	Geopolitical	Societal	Technological

Source: World Economic Forum – The Global Risk Report 2022, 2023, 2024 24. https://www3.weforum.org/ own work

The Global Risk Perceptions Survey (GRPS) highlights that long-term global risks are largely influenced by environmental factors (Global Risks Report, 2023). Among the greatest risks are those related to climate and nature, which are expected to become more severe over the next decade. The most critical risks identified are 'Failure to mitigate climate change' and 'Failure to adapt to climate change,' meaning that failing to take effective action to reduce greenhouse gas emissions and adapt to the effects of climate change will have serious consequences. Other major risks include "Natural disasters and extreme weather events" and "Biodiversity loss and ecosystem collapse," which can have devastating effects on the environment and society. Environmental and social risks are a present and persistent reality in our lives. The World Economic Forum's Global Risks Report for the past three years clearly outlines the realities we face as a society. Looking 10 years ahead, the top four risks in 2023 and 2024, and the top four in the top 10, are environmental risks. These are followed by two technological risks in 2024 and one social risk in 2023 (three social risks in 2022).

3 ESG investing

With the increasing demand for ethical and sustainable practices from investors, customers, and society at large, the need for improved and transparent ESG performance has also grown. The

global trend of targeting objectives beyond profit maximization and risk minimization involves integrating environmental, social, and governance (ESG) issues into business operations (Morgan Stanley, 2023). This trend is also evident in climate change investments, which have recently generated considerable asset flows into ESG funds. This investment process, characterized by the application of non-financial factors, is driven by climate change and existing societal inequalities, aiming to positively impact society as a whole. The race to decarbonize and achieve the key 2030 ESG headline targets has begun. Businesses are reorienting their models and practices, while long-term investors are considering how to invest capital to meet global climate goals. This is increasingly becoming a standard in the investment industry, particularly in Europe, where most sustainable fund assets are concentrated.

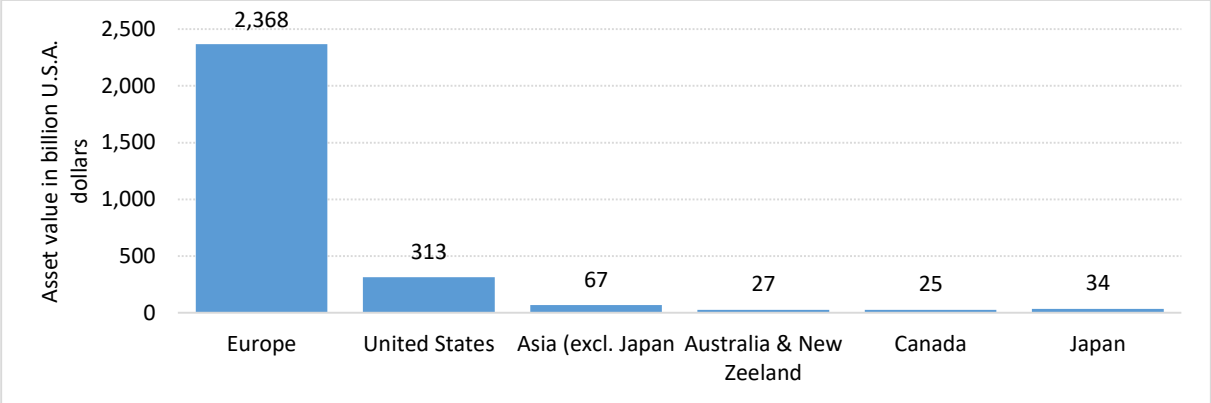

Figure 1 Asset size of sustainable funds worldwide as of the second quarter of 2023, by region, billion U.S.A. dollars

Source: authors own study or based on ESG Clarity (2024)

The data presented in Figure 1 reflect the geographical distribution of sustainable fund assets globally. Sustainable funds in Europe hold more than two trillion US dollars in assets at the end of Q2 2023, indicating a strong commitment to sustainable investing in this region. In contrast, sustainable fund assets in the US over the same period are more than seven times smaller than those in Europe, highlighting a significant difference in the adoption of sustainable investing between the two regions (Statista, 2024b). The third largest region for sustainable fund assets is Asia, excluding Japan, with assets exceeding USD 50 billion, indicating a growing interest in sustainable investing in this part of the world as well. The growth of sustainable assets in these regions demonstrates a growing awareness and commitment to responsible and sustainable investment practices.

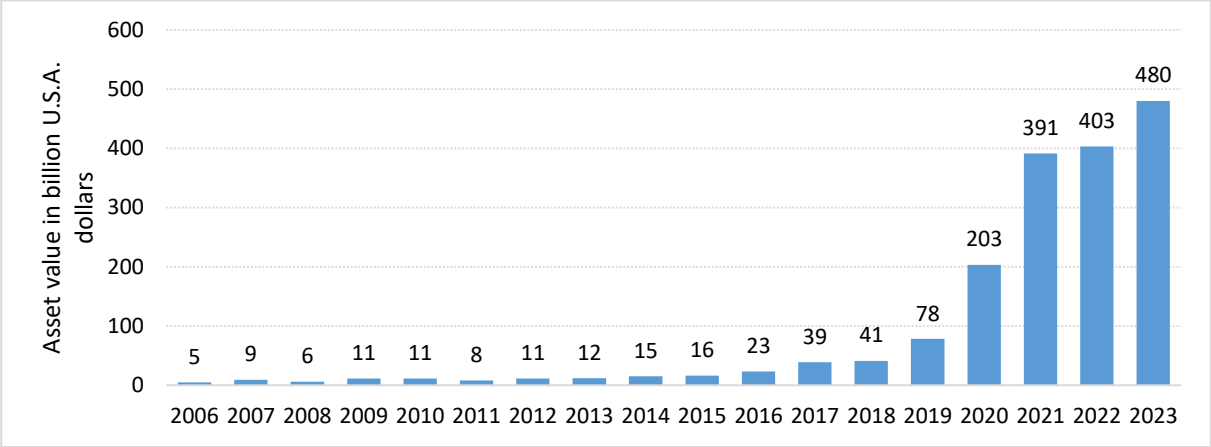

Figure 2 Global ESG ETF assets from 2006 to November 2023, billion U.S.A. dollars

Source: authors own study or based on ESG ETF (2024)

Data in Figure 2 highlight the significant growth in assets invested in ETFs pursuing ESG objectives. In 2006, the value of these assets was only $5 billion, but this grew to $391 billion by 2021 and reached $480 billion in November 2023, underlining the increasing importance of ESG (environmental, social, and governance) criteria in recent years. This rapid growth reflects a growing interest in sustainable investing, particularly in developed markets in Europe and the United States (Statista, 2024b). ESG funds are attractive to investors because they promote environmentally, socially, and governance-responsible practices while offering opportunities for competitive returns. ESG engagement has become a priority for senior management globally. Around half of senior management in countries such as France, Japan, Singapore, and Germany reported a commitment to ESG. ESG has also become increasingly important for investors (ETF, 2024). Around a third of investors are willing to exit a firm if they believe it has not taken sufficient steps to focus on ESG objectives. This reflects the global trend of increased attention to sustainable and responsible practices by both companies and investors.

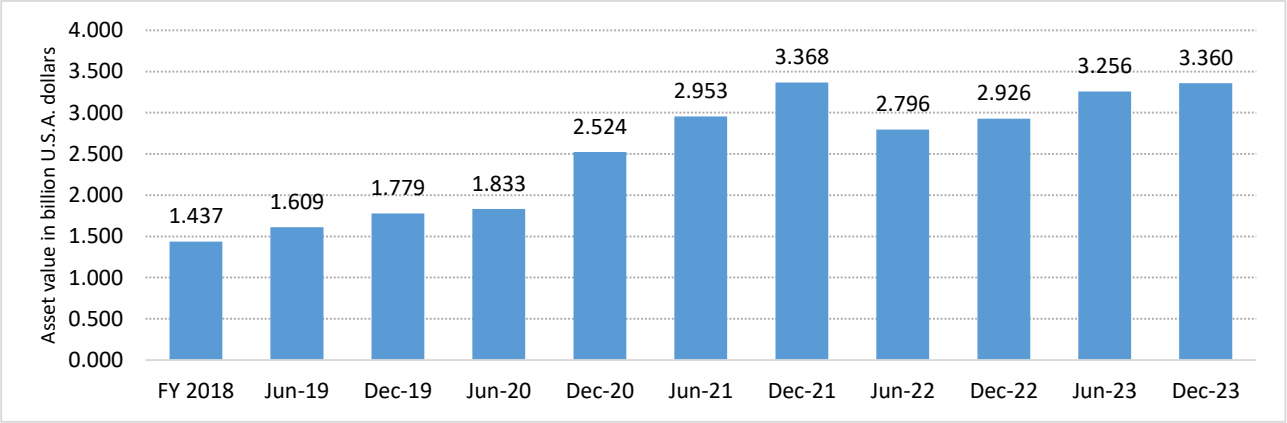

Figure 3 Assets under management of sustainable funds worldwide from 2018 to December 2023, billion U.S.A. dollars

Source: authors own study or based on Morgan Stanley (2024)

Figure 3 shows the evolution of the assets under management (AUM) of sustainable funds globally. From 2018 to 2021, the AUM of sustainable funds steadily increased, reaching the

highest level in the analyzed period—USD 3.368 trillion—in December 2021, demonstrating growing interest and investment in sustainable funds. In June 2022, the value of AUM decreased to USD 2.8 trillion due to economic and market factors that negatively affected investment in sustainable funds. By 2023, the AUM increased again to USD 3.36 trillion, indicating a renewed interest and investment in sustainable funds and a continued commitment to responsible and sustainable investing (Morgan Stanley, 2024).

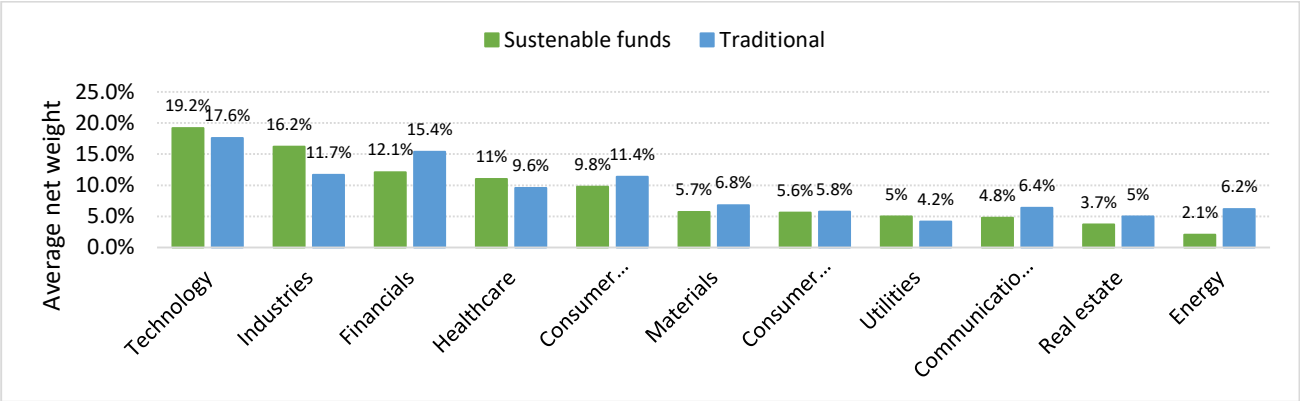

Figure 4 Average net weight of sustainable and traditional equity funds worldwide in 2023, by sector, %

Source: authors own study or based on Morgan Stanley Institute for Sustainable Investing analysis of Morningstar data as of February 9, 2024

Figure 4 highlights investment portfolio allocation preferences in 2023 for traditional and sustainable funds. The largest share of the traditional fund portfolio allocation was in the technology sector, at 17.6%, suggesting that investors saw great potential for growth and innovation in this sector. The second largest was the financial sector, accounting for 15.4% of the traditional equity funds' portfolio allocation, indicating investor confidence in the stability and profitability of the financial sector. Investing in technology was prioritized among sustainable equity funds, with almost 20% of the total portfolio value. This demonstrates that the technology sector is seen as a leader in adopting and promoting sustainable practices, thus attracting significant investment from sustainable funds due to its potential for innovation and positive impact on sustainability (Morgan Stanley, 2024).

4 Banks

With growing pressure on companies to adopt practices that reduce carbon emissions, banks are aligning their lending activities and internal operations with sustainable and responsible principles to achieve significant financial benefits. This is because investors are increasingly mindful of environmental, social, and governance (ESG) risks when making investment decisions. Banks that promote sustainability therefore gain a competitive advantage by attracting more investors who value these principles.

A growing number of large banks in Europe and around the world now openly publish and report on their commitments and impacts on environmental, social, and governance issues to contribute to the goals of the Paris Agreement (United Nations, 2015a) and the UN Sustainable Development Goals (United Nations, 2015b).

In doing so, banks set clear targets to support sustainability, report and publicize their commitments and impacts on the environment, society, and governance, demonstrating transparency and accountability (Mistrean, 2021e, 2021c). This includes allocating large sums of money to green finance projects that support green initiatives, withdrawing investments from sectors such as coal, which are known for high greenhouse gas emissions, using renewable energy sources to run their operations, thus reducing dependence on fossil fuels, and implementing various measures to reduce carbon emissions from their operations (Statista, 2019).

Table 2 Global key figures on greenhouse gas and climate financing

Green house gas emissions (GHG)	Value
Number of countries worldwide with quantifiable Nationally Determined Contributions (NDC's) - intended reductions in greenhouse gas emissions in 2019	105
Average annual decrease needed in GHG emissions to meet 1.5°C, or even 2°C, maximum temperature rise from 2020	7.6%
Estimated fall in greenhouse gases in 2020 due to the fall in human activity caused by COVID-19	6%
Total decrease in GHG Needed between 2010 and 2030 to meet 1.5°C goal	45%
Decrease in GHG emissions by developed countries and economies in transition between 2000 and 2018	-6.5%
Increase in GHG emissions by developing countries between 2000 and 2013	43.2 %

Glogal climate finance	Value
Total value of global climate finance flows 2018	546 billion U.S. dollars
Total value of global climate finance flows from the private sector 2018	323 billion U.S. dollars
Total value of global climate finance flows from the public sector 2018	224 billion U.S. dollars
Cumulative planned energy scenario investments between 2016 and 2030	38 trillion U.S. dollars
Cumulative transforming energy scenario investments between 2016 and 2030	60 trillion U.S. dollars

Source: authors own study or based on OECD, United Nations, Climate Policy Initiative, International Renewable Energy Agency (2019)

These actions reflect a growing global movement towards a more sustainable approach to finance, showing a strong global commitment to support the transition to a greener and more sustainable economy.

Climate change is significantly affecting the financial services sector, bringing increased financial risks but also opportunities for banks that manage to adapt. The financial risks associated with climate change are divided into two main categories, defined by the PRA (Prudential Regulation Authority) and the FCA (Financial Conduct Authority) as transition risks and physical risks. Transition risks are associated with the shift to a low-carbon economy and can include changes in regulation, technology, and consumer preferences, which can affect asset values and company profitability. Physical risks are related to the direct physical impacts of climate change, such as extreme weather events (floods, droughts, storms), which can cause damage to infrastructure and affect operations and supply chains.
By understanding and managing these risks, banks can not only protect themselves against financial losses but also identify new business opportunities in sustainable finance.

Table 3 Global key figures on greenhouse gas and climate financing

Transitional Risks	Physical Risks
Impact on banks' real estate lending portfolio through increased minimum energy efficiency standards	Increased business disruption and losses
Change in price of alternatives through excelled technological innovation	Impact on the availability of property and casualty insurance
Decreased value of investments that become valueless or uninsurable because of its climate change risk exposure	Impact on the cost of property and casualty insurance
Market value of companies is lowered through a company's inability to adapt or mitigate to new standards surrounding climate change	Higher insurance premiums
	Businesses choosing not to take out premiums resulting in higher exposure to future losses
	Increased credit risks via physical risks to assets held as collateral

Source: authors own study or based on OECD, United Nations, Climate Policy Initiative, International Renewable Energy Agency (2019)

Transition risks are financial risks that may arise as economies adapt to reach the net-zero carbon emissions target. These risks are associated with the changes and adjustments required to reduce greenhouse gas emissions to zero by 2050, in line with the targets set by the European Union and the UK Government under the Paris Agreement. Several adjustments are needed to achieve this goal, including:

- changes in climate-related policies and regulations, whereby governments will introduce new laws and regulations to reduce carbon emissions, which may affect companies' operations and costs;
- disruptive technologies, such as renewable energy sources and energy storage technologies, which will change the way companies operate and do business;
- changing business models, requiring companies to adapt their business models to comply with new regulations and take advantage of the opportunities offered by the transition to a green economy;

- changing societal behavior and sentiments to become more aware of the impacts of climate change. At the same time, consumer behaviors and preferences will change and influence demand for sustainable products and services;
- evolving scientific evidence, frameworks, and legal interpretations as the science and knowledge of climate change evolve to reflect new findings and understandings.

Physical risks are financial and operational risks resulting from extreme weather events and long-term climate change that can affect infrastructure, property, and business activities.

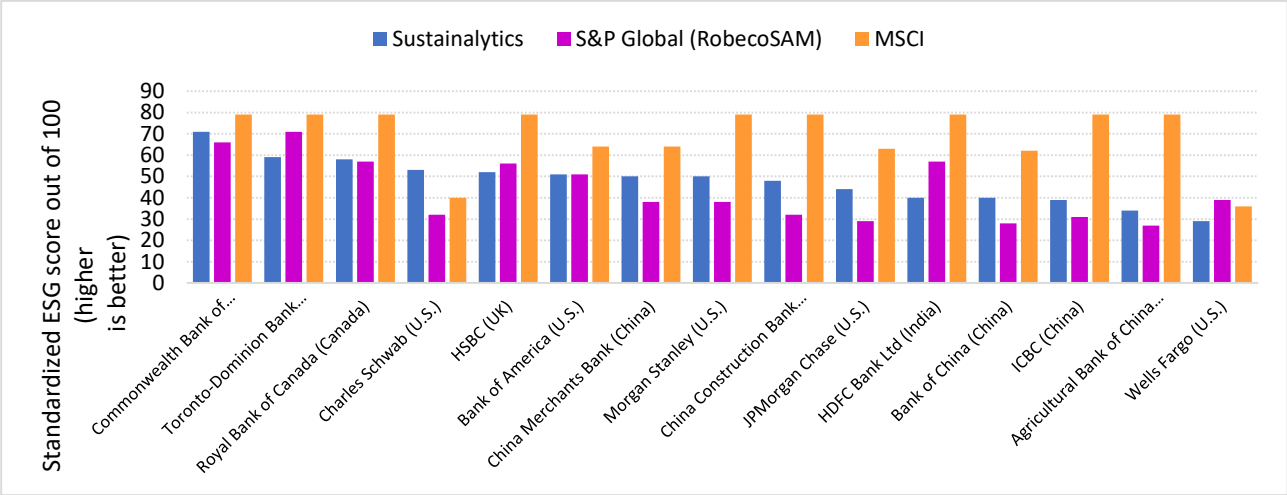

Figure 5 Average net weight of sustainable and traditional equity funds worldwide in 2023, by sector, %

Source: authors own study or based on Statista, 2024

Figure 5 highlights the significant variations in the ESG scores of the world's largest banks by score provider. In 2024, scores on environmental, social, and governance (ESG) criteria, which assess companies' performance in terms of environmental sustainability, social responsibility, and governance practices, varied significantly across different score providers for the world's largest banks. JPMorgan Chase, as the largest bank by market capitalization, received very different ESG scores from different providers. Morgan Stanley Capital International (MSCI) gave it a score of 64.3, suggesting relatively good performance in the ESG criteria. In contrast, S&P Global (formerly known as RobecoSAM) gave it a much lower score of 29, indicating poorer performance. Sustainalytics gave an intermediate score of 45. These variations in ESG scores reflect differences in the methodologies and criteria used by the different scoring providers. They also underline the importance of green bond issuance as an indicator of a bank's commitment to sustainable practices.

By 2023, the Industrial and Commercial Bank of China (ICBC) was the global leader in green bond issuance among large banks, totaling more than USD 31 billion. Green bonds are financial instruments designed to finance projects that benefit the environment. ICBC issued nine green bonds abroad and five in China (Statista, 2024).

Crédit Agricole, a French bank, took second place, issuing green bonds worth almost USD 10 billion (McKinsey & Company, 2022). Bank of China was in third place, with 15 outstanding green bonds worth just over USD 7 billion. This data demonstrates the commitment of large banks to support sustainable projects and help protect the environment by issuing green bonds.

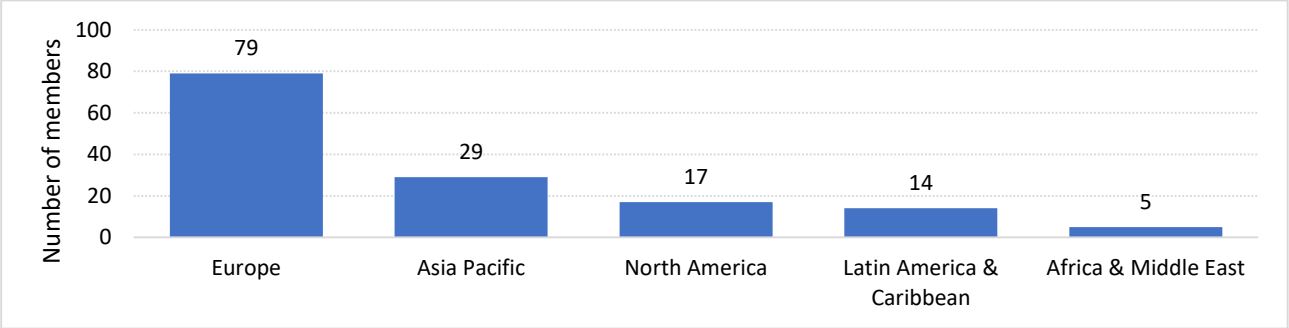

Figure 6 Number of Net-Zero Banking Alliance members worldwide 2024, by region

Source: authors own study or based on Statista, 2024

The Net-Zero Banking Alliance is a global initiative bringing together banks dedicated to reducing carbon emissions to zero by 2050. It was launched in April 2021 by 43 founding members and is convened by the United Nations. By September 2024, the alliance had grown to 144 members, the majority of which are from Europe and Asia-Pacific.

To become a member of the alliance, each bank must commit its CEO to sign a declaration of commitment, which includes clear targets, such as achieving net-zero emissions by 2050 and setting interim targets for 2030 and every five years thereafter. Banks must also publish information on their emissions annually and report on progress.

In doing so, banks around the world are implementing various sustainability initiatives to help protect the environment and promote social responsibility. The principles of responsible banking are promoted by the United Nations Environment Program Finance Initiative (UNEP FI) and are supported by banks globally by offering sustainable financial products, such as deposit accounts backed by sustainability-assessed investments and letters of credit for transactions that contribute to climate change mitigation efforts (Solis, 2024). The Net-Zero Banking Alliance reflects the banking sector's concerted efforts to help combat climate change and promote sustainable practices.

For example, Bank of America has committed to achieving net-zero greenhouse gas emissions in its financing, operations, and supply chain activities by 2050. It has mobilized $1 trillion by 2050 to accelerate the transition to a sustainable low-carbon economy (Bank of America, 2024). It has achieved carbon neutrality and has purchased 100% renewable electricity since 2019. U.S. Bank has reduced greenhouse gas emissions by 60% since 2014 and plans to use 100% renewable energy by 2025 (U.S. Bank, 2024).

The bank offers financial solutions aimed at creating lasting positive impacts for people and the planet, including special housing loan programs and social and racial equity bond structures. Crédit Agricole is a leader in issuing green bonds, using the funds to support renewable energy projects and other green initiatives (McKinsey & Company, 2022). Bank of China has issued numerous green bonds to finance environmental projects, contributing to sustainable development. India is launching green banks that focus on financing environmental projects and promoting online and card-based transactions to reduce environmental impact (Supreeth, 2022).

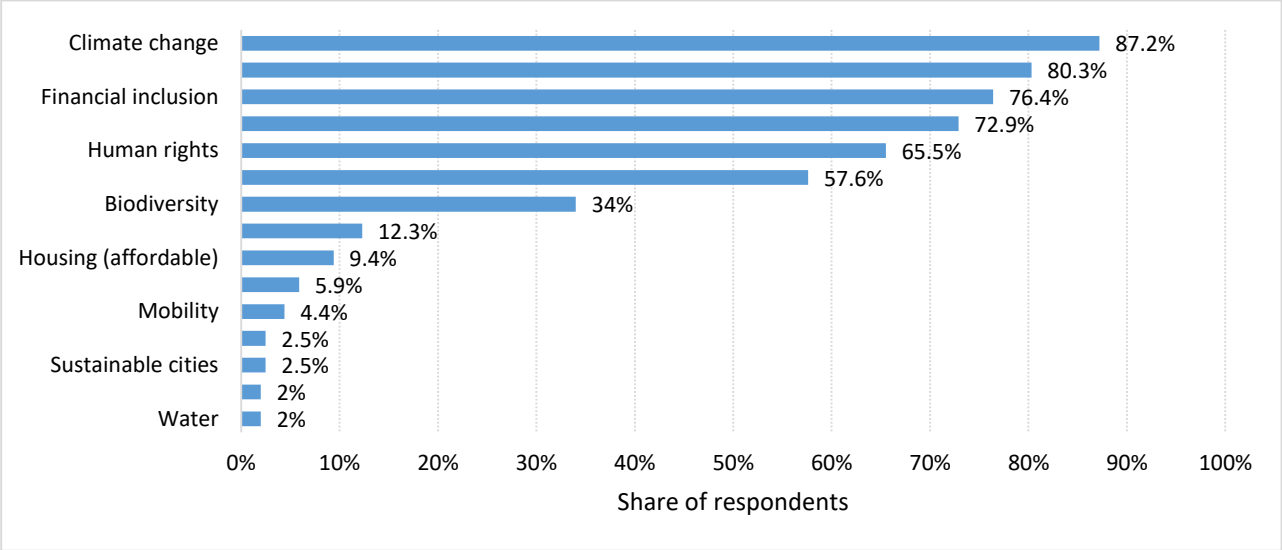

Figure 7 Number of Net-Zero Banking Alliance members worldwide 2024, by region

Source: authors own study or based on Statista, 2024

The data presented in Figure 7 demonstrate that by March 2021, banks that have signed the Principles for Responsible Banking (PRB), which commit to contributing to a fairer society and a healthier environment, have prioritized two major sustainability goals: climate change and gender equality. Addressing climate change was included in the sustainability strategy by 87.2% of PRB signatories globally and involves efforts to reduce greenhouse gas emissions, promote renewable energy, and support projects that combat climate change (Statista, 2024). Improving gender equality has been included in the sustainability strategy by 80.3% of the banks that have signed the Principles for Responsible Banking. This objective focuses on promoting equal opportunities between men and women, both within banking institutions and in the communities they serve. In addition to these two goals, financial inclusion was also an important issue for PRB signatory banks, included in the sustainability strategy by 76.4% of PRB signatories. Financial inclusion refers to ensuring access to financial services for all segments of the population, including those traditionally excluded from the financial system.

6 Moldova

The financial banking system functions as a relay in the orientation of funds in the economy. In the context of ESG (environmental, social, and corporate governance) priorities, it has an increasingly defined and regulated mission to monitor and direct capital towards sustainable development in line with the 2030 Agenda and the objectives of transitioning to a low-carbon economy.

With the rapid expansion of new technologies and changing market requirements, financial-banking institutions in the Republic of Moldova are promoting sustainable projects that contribute to the well-being of consumers and the development of the economy by increasing financial inclusion, enhancing financial intermediation on a sustainable basis, and reducing related risks (Mistrean, 2022). The banking system plays a key role in supporting companies in the transition to a green economy and supports the shift to climate finance through the

development of green products (Mistrean, 2021c, 2021e, 2023b). It is also considered that the implementation of the sustainable finance strategy should reflect developments in the real economy. BC "ProCredit Bank" S.A. is the first bank in the Republic of Moldova to set the goal of promoting economic development at the most sustainable level. In 2013, it launched the EcoCredit service for business customers, offering small and medium-sized enterprises "green" loans to finance various types of projects.

Table 4 Projects eligible for funding in the Republic of Moldova

Type	Purpose	Amount	Results	Term
Energy efficiency projects: furnace replacement	Replace the old equipment with a rotary oven with electric control panel and constant baking temperature to optimize production costs	160 000 MDL	Monthly energy savings (electricity consumption) around 25.5%. Increase productivity by 7%. Improved product quality / reduced number of defective products.	1,5 years
Renewable energy projects: installation of solar panels	Installation of panels with a total capacity of 30 kW; 125 polycrystalline silicon modules of 240Wp each	625 000 MDL	Renewable electricity generation 44,4 MWh/year. Cost of generated electricity 85 250 Lei/year. Increase in asset value.	7,3 years
Environment-friendly projects: mini-till and no-till technologies	Purchase of a seed drill for efficient tillage using mini-till and no-till technology.	500 000 MDL	Reduce fuel consumption by reducing the number of tillage operations. Stop soil deterioration and soil rehabilitation. Increase soil productivity and grain quality.	

Source: EcoCredit (2024) / own work

The "green" credit from BC "ProCredit Bank" S.A. is intended for very small, small, and medium-sized enterprises and is designed to offer a number of benefits to entrepreneurs, including competitive advantages, reduced operating expenses, increased productivity, more efficient technologies and processes, environmental protection, and responsible use of natural resources. In this respect, green loans aim to finance energy efficiency, renewable energy, and environmentally friendly projects. By promoting investments in energy efficiency and "green" energy, BC "ProCredit Bank" S.A. aims to raise awareness and facilitate access to financing for "green" projects for entrepreneurs in the Republic of Moldova (EcoCredit, 2024).

Table 5 Evolution of the value and structure of the green portfolio of BC "ProCredit Bank" S.A.

Year	Portfolio volume, mil, EUR	Portfolio structure, %		Share of total credit portfolio, %
		in energy efficiency	environment-friendly and renewable energy projects	
2023	25,9	72,6%	27,5%	14,7%
2022	29,3	79,5%	20,5%	16,6%
2021	28,8	83,1%	16,9%	16,8%
2020	26,5	82,8%	17,2%	17,2%
2019	20,3	-	-	15,6%
2018	20	-	-	18%

Source: EcoCredit (2024) / own work

At the end of 2023, the green loan portfolio constituted 14.7% of the bank's total loan portfolio, with a value of EUR 25.6 million, decreasing by EUR 3.4 million or 11.6% compared to 2022. In 2022, the bank's green loan portfolio reached the highest level in the analyzed period—EUR 29.3 million—and accounted for 16.6% of the bank's total loan portfolio. However, the highest share of the green loan portfolio in the bank's total loan portfolio was recorded in 2018 at 18%, marking the beginning of green lending by BC "ProCredit Bank" S.A. (EcoCredit, 2024).

The majority share of the "green" portfolio is represented by investments in energy efficiency at 72.6%, down by 10.5 percentage points compared to 2021, when investments in energy efficiency accounted for 83.1% of the "green" portfolio, the highest share in the analyzed period. At the same time, we observe an increase in the share of investments in environmentally friendly and renewable energy projects to 27.5% in 2023.

During these years, the bank has seen an increase and diversification in the number of projects financed in investments in photovoltaic installations with installed capacity up to 8.4 MWp, both for reducing own electricity consumption and for commercialization. These installations were placed both on the roofs of production and warehouse buildings and on the ground, benefiting from net metering, thus reducing the costs of electricity consumption from the grid. The share of the green portfolio with renewable energy projects increased to 16.9%.

In this regard, BC "ProCredit Bank" S.A. promotes investments in renewable energy, resource efficiency, and environmental protection measures (e.g., use of electric transportation, waste management, efficient use of water, organic production). The bank takes into account the environmental and social aspects of these projects, providing support to clients with intentions to produce "green" energy, contributing to improving air quality in our country and reducing dependence on fossil fuels.

In December 2018, the Maib Board approved the Sustainability Strategy and ESG Action Plan (developed with the help of GGF (Green for Growth Fund) and EU4Energy, who sponsored the "Greening maib" project), which set out the sustainability objectives and the activities needed to achieve them (maib, 2023). Maib's ESG strategy covers all key areas, including:

- reducing greenhouse gas emissions from its own operations;
- reducing financed emissions (emissions from portfolio companies);

- introducing a comprehensive sustainability reporting system;
- achieving a 10% ratio of green loans to total loans in the SME/Corporate segments by 2025;
- developing and launching green products in line with market expectations and demand;
- assessing all Maib products against financial inclusion criteria;
- treating employees fairly and contributing to their growth and development;
- maintaining and promoting sound corporate governance standards.

Maib offers customers two types of green loans:

- Eu4Business - Business Modernization Credit Line from EBRD resources;
- GEFF (Green Economy Financing).

Table 6 Line of credit for business modernization from EBRD resources from maib

Feature	Supports the business sector by stimulating investment in cutting-edge technologies, including energy efficiency, modernizing businesses and bringing them up to EU standards
The aim	- financing investments in business development/expansion, volume and production capacity, - financing energy efficiency projects, production and use of renewable energies, etc.
Advantages	- 10% or 15% grant component, - grace period, - flexibility for different investment needs.
Repayment deadline	- up to 72 months
Amount of credit	- up to 100% of the cost of the investment project, excluding VAT, up to EUR 3 million.

Source: maib (2024) / own work

GEFF (Green Economy Finance Facility) financing is provided under the EBRD's Green Economy Finance Facility (GEFF), in partnership with maib. The project is co-financed by the Green Climate Fund and the Turkish Ministry of Finance and Treasury.

Table 7 GEFF (Financing the green economy) from maib

Feature	It supports the reduction of energy consumption and related energy costs and ensures increased turnover thanks to equipment with higher productivity and reliability, contributing to improved product quality and competitiveness.
The aim	- renovation of windows, doors; - thermal insulation systems; - central heating and heat pumps; - electricity and cogeneration; - cooling systems; - motors and pumps; - process technologies; - transportation;

	- household appliances; - lighting; - irrigation; - land preparation and seeding; - cleaning and washing; - water reuse and reclamation.
Advantages	- interest can be subsidized; - no own contribution required; - technical assistance is available; - reduction of pollution and CO2 emissions.
Repayment deadline	- up to 48 months
Amount of credit	- up to EUR 5 million.

Source: maib (2024) / own work based on GEFF

If the borrower selects a pre-approved technology from the EBRD's Green Technology Selector (windows and doors, thermal insulation systems, thermal power plants, heat pumps, electricity and cogeneration, cooling systems, motors and pumps, process technologies, transportation, household appliances, lighting, cleaning and washing, irrigation, land preparation and seeding, water reuse and recovery), it can be financed without further approval (Green Technology Selector, 2024).

In 2023, maib launched a special renewable electricity generation loan for SMEs. The loan takes the customer from plan to project in a fast and efficient way, requiring very little investment and effort from the customer. The favorable financing terms mean that up to 80% of the project can be covered by the loan without the need for additional collateral, which is particularly important for SMEs. In addition, maib has established a trusted network of partners who install solar panels, allowing customers to choose from a wide range of experienced installers. All this has increased the business unit's green loan portfolio to RON 418 million at the end of Q2 2024.

The other banks in the Republic of Moldova are taking the first steps towards the implementation of sustainable financing, which implies ensuring good governance and increasing social responsibility with a positive impact on local business and society in general.

8 Conclusion

In an ever-changing world with a growing awareness of the negative impact of economic activities on the environment and society, ESG is becoming increasingly relevant. It is more than just a trend; it is an imperative for companies of all sizes to integrate these principles into their DNA.

ESG alignment is not only a response to current investor and consumer expectations, but also an opportunity for companies to define and strengthen their position in a future where responsibility and sustainability will play a central role. Adopting and implementing ESG

practices not only contributes to good governance and social responsibility, but also to enhancing reputation, attracting sustainable investment and long-term sustainable growth.
Research results demonstrate the trend of increasing product diversity and sustainable business investment strategies; the development of new technologies to facilitate the net-zero transition; increasing global government regulations that will influence business activity and data.
In the coming decade, investors and companies will need to adapt to the increasingly complex field of sustainable finance in order to make informed decisions, mitigate risks and seize emerging investment opportunities.

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References

1. Bank of America, 2024. Environmental sustainability. [online] Available at: <https://about.bankofamerica.com//> [Accessed 22 September 2024].
2. EcoCredit, 2024. ProCreditBank. Proiecte eligibile. [online] Available at: <https://www.procreditbank.md//> [Accessed 22 September 2024].
3. European Bank for Reconstruction and Development (EBRD), 2021. EU4Business-EBRD Credit line. [online] Available at: < https://www.ebrd.com/> [Accessed 22 September 2024].
4. European Commission, 2020. The European Green Deal. Striving to be the first climate-neutral continent. [online] Available at: < https://commission.europa.eu/> [Accessed 22 September 2024].
5. European Commission, 2024. Shaping Europe's digital future. [online] Available at: <https://commission.europa.eu/> [Accessed 22 September 2024].
6. European Commission, 2021b, Communication from the Commission to the European Parliament, the Council, The European Economic and Social Committee and the Committee of the Regions, Strategy for Financing the Transition to a Sustainable Economy, COM (2021) 390 final. [online] Available at: <https://eur-lex.europa.eu//> [Accessed 22 September 2024].
7. European Commission, 2021a. The Digital Europe Programme. [online] Available at: <https://digital-strategy.ec.europa.eu/> [Accessed 22 September 2024].
8. European Environment Agency, 2023. Economic losses from weather and climate-related extremes in Europe reached around half a trillion euros over past 40 years. online] Available at: <https://www.eea.europa.eu/> [Accessed 22 September 2024].

9. European Parliament, 2022. Regulation (EU) 2022/2554 of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations. [online] Available at: <https://eur-lex.europa.eu/legal-content/en/> [Accessed 22 September 2024].
10. ETF, 2024. ETFGI Global ETF and ETP Industry Insights. [online] Available at: <https://beta.etfgi.com/> [Accessed 22 September 2024].
11. Global Risks Report, 2023. Global Risks Perception Survey (GRPS). [online] Available at: <https://www.weforum.org/> [Accessed 22 September 2024].
12. Green Technology Selector, 2024. Connecting vendors of green technologies with forward-thinking businesses and homeowners. [online] Available at: < https://techselector.com/> [Accessed 22 September 2024].
13. International Energy Agency, 2023. CO2 Emissions in 2022. CO2 Emissions in 2022 – Analysis - IEA. [online] Available at: <https://www.iea.org/> [Accessed 22 September 2024].
14. Maib, 2024. Strategia și planul de acțiuni ESG. [online] Available at: <https://www.maib.md//> [Accessed 22 September 2024].
15. McKinsey&Company, 2022). Banking on a sustainable path Global Banking Annual Review 2022. [online] Available at: <https://www.mckinsey.com/> [Accessed 22 September 2024].
16. Mistrean, L., Belostecinic, G., and Staver, L., 2024a. Research on consumer preferences and consumer satisfaction levels in the banking sector: a case study in the Republic of Moldova. *Global Financial Analytics and Business Forecasting*. New York: Nova Science Publishers, Inc. p. 83-116.
17. Mistrean, L., 2024b. Research on the Financial Education Level of the Banking Consumers in the Republic of Moldova. *Contemporary Challenges in Social Science Management: Skills Gaps and Shortages in the Labour Market*, Emerald Publishing Limited, Leeds, pp. 23-45.
18. Mistrean, L., Bușmachiu, E., and Staver, L., 2022. The credit market for small and medium enterprises in the Republic of Moldova. *Insurance and Risk Management for Disruptions in Social, Economic and Environmental Systems: Decision and Control Allocations within New Domains of Risk*. Emerald Publishing Limited, Bingley, pp. 109-130.
19. Mistrean, L., 2023a. Factors Influencing Customer Loyalty in the Retail Banking Sector: A Study of Financial-Banking Services in the Republic of Moldova. *Opportunities and Challenges in Sustainability*, 2(2), 81-92. [online] Available at: <https://pdfs.semanticscholar.org/> [Accessed 22 September 2024].
20. Mistrean, L., 2023b. Contemporary directions on how consumers interact with financial-banking services. The *USV Annals of Economics and Public Administration*, Vol 23, No 1(37) (2023), p. 151-161. [online] Available at: <https://doaj.org/article> [Accessed 22 September 2024].
21. Mistrean, L., 2021a. Behavioural evolution of consumers of banking services in the COVID-19 pandemic situation. In: *Journal of Corporate Governance, Insurance, and Risk Management (JCGIRM)*, 2021, v. 8, s. 1, p. 84-100. [online] Available at: < https://www.academia.edu/> [Accessed 22 September 2024].
22. Mistrean, L., 2021b. Behavioural evolution of consumers of banking services in the COVID-19 pandemic situation. The *Journal of Corporate Governance, Insurance, and Risk Management (JCGIRM*). [online] Available at: <https://www.um.edu.mt/> [Accessed 22 September 2024].
23. Mistrean, L., 2021c. Customer orientation as a basic principle in the contemporary activity of the bank. *Journal of Public Administration, Finance and Law*. [online] Available at: < https://www.academia.edu/> [Accessed 22 September 2024].
24. Mistrean, L., and Staver, L., 2021d. The impact of the COVID-19 pandemic crisis on demand for financial-banking services. [online] Available at: <https://irek.ase.md/> [Accessed 22 September 2024].
25. Mistrean, L., 2021e. Banking customer relationship management under the impact of new information technologies. În: *Современный менеджмент: проблемы и перспективы.* [online] Available at: <https://unecon.ru/sites/default/files/sbornik_statey_2021_itogo.pdf> [Accessed 22 September 2024].
26. Morgan Stanley, 2024. Institute for Sustainable Investing, Sustainable Reality. [online] Available at: <https://www.morganstanley.com/> [Accessed 22 September 2024].
27. Morgan Stanley, 2023. Institute for Sustainable Investing. Trends for the Next Decade of Sustainable Investing. [online] Available at: <https://www.morganstanley.com/> [Accessed 22 September 2024].

28. Parlamentul European, 2024a. Pactul verde: cheia unei Uniuni neutre climatic și sustenabile. [online] Available at: <https://www.europarl.europa.eu/> [Accessed 22 September 2024].
29. Parlamentul European, 2024b. Ce este neutralitatea emisiunilor de dioxid de carbon și cum poate fi realizată până în 2050. [online] Available at: <https://www.europarl.europa.eu/> [Accessed 22 September 2024].
30. PCAF (Partnership for Carbon Accounting Financials), 2024. An industry-led partnership to facilitate transparency and accountability of the financial industry to the Paris Agreement. [online] Available at: <https://carbonaccountingfinancials.com> [Accessed 22 September 2024].
31. REPowerEU, 2022. A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition. [online] Available at: <https://commission.europa.eu/> [Accessed 22 September 2024].
32. Sachs, J., Woo, W., and Yoshino, N., 2019. *Handbook of Green Finance Energy Security and Sustainable Development.* Singapore: Asian Development Bank Institute
33. Statista, 2024. Energy & Environment. Annual carbon dioxide (CO_2) emissions worldwide. [online] Available at: <https:// www.statista.com> [Accessed 22 September 2024].
34. Statista, 2024a. Industries & Markets. Green banking. [online] Available at: <https:// www.statista.com> [Accessed 22 September 2024].
35. Statista, 2024b. Digital & Trends. ESG investing. [online] Available at: <https:// www.statista.com> [Accessed 22 September 2024].
36. Statista, 2019. Environmental commitments of Europe's largest banks. Statista dossierplus on the environmental goals set by some of Europe's largest banks. [online] Available at: <https:// www.statista.com> [Accessed 22 September 2024].
37. Solis, D., 2024. Exploring Sustainable Banking: Practices, Impact, and Future Trends. Sustainability Business Toolkit. [online] Available at: <https://www.sustainablebusinesstoolkit.com/> [Accessed 22 September 2024].
38. Supreeth, G., 2022. Sustainability in Banking, India. [online] Available at: <https://www.capgemini.com//> [Accessed 22 September 2024].
39. United Nations, 2015a. Climate Change. The Paris Agreement. [online] Available at: <https://unfccc.int/> [Accessed 22 September 2024].
40. United Nations, 2015b. Climate Change. The 17 Sustainable Development Goals (SDGs). [online] Available at: <https://sdgs.un.org/> [Accessed 22 September 2024].
41. United Nations, 2015c. Transforming our world: the 2030 Agenda for Sustainable development. [online] Available at: <https://sustainabledevelopment.un.org/> [Accessed 22 September 2024].
42. U.S. Bank, 2024. We're driving inclusive and sustainable growth. [online] Available at: <https://www.usbank.com/> [Accessed 22 September 2024].

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THE ROLE OF MICRO-CREDENTIALS IN BRIDGING THE SKILLS GAP BETWEEN HIGHER EDUCATION AND THE PLATFORM ECONOMY

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Abstract: As the pace of technological change accelerates, traditional degree programs often struggle to keep pace with industry needs, especially in the context of platform business models. Micro-credentials have the potential to serve as a flexible, targeted solution to this challenge. The purpose of the study is to evaluate the potential of using micro-credentials to address the skill gap between the curricula of traditional higher education programs and the evolving demands of the platform economy. The subject of the study is the impact of micro-credential programs on workforce readiness and skill gap between higher education program outcomes and platform economy demands. We conduct a systematic literature review and a comprehensive trend analysis of skill requirements in the platform economy. Our review reveals several key advantages of micro-credentials in the context of the platform economy: more granular and immediately applicable skills, faster curriculum updates to match industry trends, and greater learner flexibility in building personalized skill sets. Additionally, we identify a number of challenges that have to be addressed when planning and incorporating micro-credential programs: quality assurance, implementing appropriate assessment mechanisms, credential recognition and transferability, and potentially higher risk of credential inflation. The study suggests that integrating micro-credentials into existing educational frameworks has the potential to enhance the responsiveness of higher education to labor market needs, particularly in the rapidly developing platform economy.

Keywords: micro-credentials, platform economy, higher education, educational innovation, competency-based education
JEL Classification: I23, J24

1. Introduction

The platform economy is an economic model characterized by digital platforms that facilitate the exchange of goods and services in a two-sided market, encompassing sectors such as ride-hailing, food delivery, freelance services, and accommodation sharing. A notable feature of platform markets is cross-group network externalities, where the growth of one group (e.g., consumers) causes the other group to grow, creating self-reinforcing loops that lead to exponential platform growth (Xue, Tian and Zhao, 2020).

The rise of the platform economy has significantly impacted labor markets, creating both new opportunities and challenges. Greater reliance on technology enables more efficient matching of supply and demand while promoting a more flexible and diverse labor market. However, along with perceived flexibility, gig workers are met with de-flexibilisation and emergence of "sticky labor" (Sun, Yujie Chen and Rani, 2023). Furthermore, the redefinition of the employer-

employee relationship raises concerns regarding job precarity and income disparities caused by differences in service prices among sectors, fluctuating demand, and gender dynamics (Vyas, 2021; Organised by: EUPHA-SSWH and Chair persons: Ute Bültmann (EUPHA-SSWH), Agnes Meershoek (Netherlands), 2022). Despite a complex landscape, platform economy enjoys rapid, steady growth. Thus, in 2023 the platform economy was valued at $11.321 billion in the US, which is 23.49% more compared to the previous year; $314.60 million with a 24.76% increase in Europe; and $244.60 million with a 29.84% growth in Africa. Asia-Pacific was the only region where the platform economy faced a minor decline, evaluated at $2.225 billion, down by 9.31% (Hosseini, 2023).

As more workers engage or consider engaging in the platform economy, either as a primary or supplemental source of income, this creates additional challenges for higher education institutions to met students' evolving needs. In addition to the greater influence of a new technological landscape manifested in transforming the concept of the classroom and digitization of study materials, the platform economy facilitates changes in the audiences of study programs and their expectations: multi-disciplinary, cross-professional learning not based on the previous curriculum (Yudie, 2019). This drives demand for practical, easily applicable, and transferable skills.

2. Theoretical Framework

The role of micro-credentials in bridging the skill gap in the platform economy is complex and multifaceted. Thus, to conduct a more comprehensive evaluation, we take into account two important, relevant theoretical frameworks: Competency-Based Education (CBE) and human capital theory.

2.1. Competency-Based Education

Competency-Based Education (CBE) is an educational approach that emphasizes evidence of mastery as a successful outcome compared to the traditional time-based model. In this context, competencies are defined as measurable skills, knowledge, and abilities students must demonstrate to progress. CBE is often described as an outcome-based approach where time is variable while performance is constant (Açıkgöz and Babadoğan, 2021).

The main features of competency-based education include a focus on skills that extend beyond academic learning to real-world applications, a personalized learning process allowing students to tailor it to their needs and preferred pace, continuous assessments and feedback to measure progress, and progression based on demonstrating mastery of required competencies.

CBE plays a significant role in transforming higher education by aligning educational outcomes with labor market demands. It has the potential for a number of improvements: enhancing graduates' employability by focusing on competencies employers seek and demonstrating skills through tangible assessments (Doucet and Bélisle, 2024), increasing flexibility for students, which leads to a better balance of education with other commitments (Johnstone and Leasure, 2015), better knowledge and skill retention due to emphasis on mastery learning, which further facilitates the applicability of skills in practical contexts (MacNutt *et al.*, 2024), as well as providing better alignment with industry needs, which ensures that acquired competencies are relevant and up-to-date (Bonnard, 2020).

2.2. Human Capital Theory

The human capital theory (HCT) is a concept in economics that views education as a form of investment in human capital, yielding long-term financial benefits such as higher earnings and better employment opportunities. HCT is closely connected with the massification of higher education, driven by increasing demand for skilled labor. However, contemporary interpretations of the human capital theory also include non-monetary benefits like improved health, increased civic engagement, and personal fulfillment (Matache, 2023).

Micro-credentials and the shift to building practical competencies during the study process align closely with the concept of HCT, both viewing skills and competencies acquired through education as tools for enhancing individual productivity and yielding returns. As the industry develops, we can observe a "race" between education and technology. Through the lens of human capital theory, this creates a significant challenge for higher education institutions to meet these demands, largely driven by rapid technological advancements. Greater flexibility in education may assist in aligning human capital development with technological change (Diebolt and Haupert, 2016).

3. Micro-Credentials in Higher Education

A promising answer to the evolving demands of the job market is the concept of micro-credentials. Micro-credentials are small-scale, short learning programs that provide learners with specific knowledge, skills, and competencies. They are characterized by increased flexibility and focus on targeting specific learning outcomes and usually are not recognized as traditional degrees (McGreal *et al.*, 2022). Interest in micro-credentials, especially in higher education, has grown significantly since 2017, aligning with global technological advancements and the increasing demand for flexible, online learning models. The global market for online degrees is expected to reach $74 billion by 2025, with micro-credentials being a major contributor to its growth (Ahsan *et al.*, 2023).

In the context of higher education, micro-credentials have a multifaceted influence. Firstly, they decentralize the learning process by allowing learners to acquire targeted skills from multiple sources, empowering them by offering flexible, lower-cost alternatives that fit their specific career or personal development needs. At the same time, they dissolve traditional disciplinary boundaries and redefine control over delivering and evaluating knowledge, further fragmenting learning into smaller units that can be "stacked" on top of each other, producing a skill set for performing certain work. This may lead to the fragmentation of educational knowledge and occupational roles, diminishing the structured nature of knowledge transmission in certain disciplines. For example, competencies like "critical thinking" or "problem-solving" may lose important context, negatively influencing the process of building connections between foundational knowledge and practical application (Wheelahan and Moodie, 2022, 2024).

Micro-credentials align closely with the competency-based learning model by focusing on specific, market-aligned skills and offering personalized learning paths, enabling the incremental building of necessary competencies. Considering that many micro-credential programs are developed in collaboration with industry partners, they gain practical application as a tool for increasing employability. The assessment process in micro-credentials is based on

demonstrating proficiency, which mirrors the emphasis on mastery rather than time spent in a classroom in the competency-based learning model (Ahsan *et al.*, 2023).

This is critically important for addressing the growing skill gap within the platform economy. Although digital literacy, technical competencies, and soft skills such as communication, critical thinking, leadership, and teamwork are instrumental for platform economy workers, they are often underrepresented in students' education. These skills are often assumed to be learned, but employers indicate they are frequently missing. Moreover, as rigid study programs focus on building fundamental skills, students often have no or limited means to acquire more practical, industry-specific skills employers expect them to have. This causes a gap not only in obtained and expected competencies but also in the perception of work readiness between graduates and employers. By integrating micro-credentials, especially co-curricular options that complement the main program, higher education institutions may address this gap, providing students with both foundational knowledge and applicable skills to increase their employability (Dolce, 2021).

At the same time, micro-credentials are deeply rooted in human capital theory, which is becoming more dominant amid the knowledge economy environment, reinforcing the view that the primary concern of education is to equip individuals with marketable skills. In this view, micro-credentials align higher education curriculum with labor trends, prioritizing employability over deeper disciplinary understanding. This leads to the emergence of a new market-driven entity, the "homo economicus," who must continuously reskill in response to fluctuating job market demands, reducing education to a transactional, market-oriented activity (Wheelahan and Moodie, 2024).

3.1. Trends of Skill Requirements in Platform Economy

Based on findings outlined in the previous sections and the analysis of available literature, we conduct a trend analysis of skill requirements amid the platform economy. In this section, we provide a summary of our findings.

1. Due to the growing possibilities for automation, especially amid the latest developments in the AI field, a number of jobs are at risk of being automated. Although this situation creates more opportunities for roles requiring higher cognitive and creative skills, it also leads to a growing demand for digital literacy, data analysis, and programming skills, as well as an increasing importance of lifelong learning and related skills, including proficiency in AI-based tools (Hibrida and Sunarni, 2023; Nimmagadda *et al.*, 2024).
2. The growth of the platform economy is pushing workers towards specialization, emphasizing the value of specific niche competencies in demand on gig platforms while continuously diversifying their skills to ensure a steady flow of tasks. This trend is further magnified by the algorithmic nature of such platforms, designed to match workers with tasks that align with their expertise (Nimmagadda *et al.*, 2024).
3. Remote and hybrid work modes, accelerated by the COVID-19 pandemic, play an important role for platform economy workers who are expected to demonstrate high levels of self-management, discipline, time management, and communication skills to efficiently work in remote, asynchronous environments (Hibrida and Sunarni, 2023).

4. Although most workers recognize the importance of acquiring new skills, actual reskilling and upskilling efforts remain limited, with only a small subset of workers actively pursuing retraining. At the same time, there is a growing interest in employer-facilitated training programs, particularly those focusing on the skills needed for emerging technologies and platforms (Hibrida and Sunarni, 2023).

3.2. Advantages of Micro-Credentials

Further analyzing the role of micro-credentials in bridging the skill gap in the platform economy, we outline the following advantages:

1. Micro-credentials offer more granular and immediately applicable skills, aligning closely with competency-based education principles. This allows learners to quickly acquire and demonstrate mastery of particular in-demand skills, upskill, or reskill as necessary. This not only contributes to employability but also provides employers with a clear understanding of a candidate's capabilities.
2. When integrated as part of the study program, the flexible nature of micro-credentials enables faster curriculum updates to match evolving industry trends, enhancing human capital and providing economic benefits for individuals and employers.
3. By utilizing micro-credentials, learners have more flexibility in building personalized skill sets to meet the dynamic demands of the platform economy. Compared to traditional curriculum-based programs, this approach allows learners to acquire specific skills based on their career goals, interests, and the requirements of their chosen field within the platform economy.

3.3. Challenges of Micro-Credentials

At the same time, micro-credentials introduce several challenges that need to be addressed for smooth and efficient adoption:

1. The quality assurance process in competency-based education and ensuring standards in competency assessments of micro-credentials are more challenging compared to traditional educational programs. This may lead to inconsistencies in the value and reliability of micro-credentials, undermining their credibility with employers and educational institutions.
2. Although micro-credentials are generally presented as an affordable alternative to traditional degrees, the cumulative cost of multiple micro-credentials may not be affordable for all learners. This may lead to a widening skills gap, rather than the intended effect of democratizing education and skill acquisition for the platform economy.
3. Since most micro-credential programs currently exist outside the traditional educational model, their credibility and transferability remain unclear. Even if some programs offer course credits, the "stack" of credentials a learner collects over time cannot be easily translated into an equivalent study program, leaving its recognition to the employer's discretion.
4. As micro-credentials become more common, their value may diminish over time. This could lead to credential inflation, requiring learners to have multiple micro-credentials even for entry-level positions. Consequently, learners might feel pressured to continuously acquire new micro-credentials to remain competitive, potentially increasing their educational burden.

4. Conclusion

Micro-credentials are a promising but complex tool that introduces several benefits and challenges for higher education institutions. In the study, we assess the latest trends regarding skill requirements in the platform economy and evaluate the advantages and challenges of micro-credentials as a way to address the growing skill gap between higher education and platform economy needs. Our research suggests that integrating micro-credentials into existing educational frameworks has the potential to enhance the responsiveness of higher education to labor market needs, particularly in the rapidly developing platform economy.

The present study focuses on evaluating micro-credentials through the lens of two frameworks: competency-based education and human capital theory. It aims to assess the influence and considerations associated with introducing micro-credentials in the higher education context. The study does not cover implementation or technical aspects. Future research may explore this direction, applying frameworks like the Technology Acceptance Model (TAM) to assess the readiness and perception of technologies associated with micro-credentials.

References

1. Açıkgöz, T. and Babadoğan, M.C. (2021) 'COMPETENCY-BASED EDUCATION: THEORY AND PRACTICE', *Psycho-Educational Research Reviews* [Preprint]. Available at: https://doi.org/10.52963/PERR_Biruni_V10.N3.06.
2. Ahsan, K. *et al.* (2023) 'Implementation of micro-credentials in higher education: A systematic literature review', *Education and Information Technologies*, 28(10), pp. 13505–13540. Available at: https://doi.org/10.1007/s10639-023-11739-z.
3. Bonnard, C. (2020) 'What employability for higher education students?', *Journal of Education and Work*, 33(5–6), pp. 425–445. Available at: https://doi.org/10.1080/13639080.2020.1842866.
4. Diebolt, C. and Haupert, M. (2016) 'Human Capital', in *Handbook of Cliometrics*. Heidelberg, Germany: Springer Verlag, pp. 55–86. Available at: https://dash.harvard.edu/bitstream/handle/1/34309590/human_capital_handbook_of_cliometrics_0.pdf?sequence=1&isAllowed=y (Accessed: 23 September 2024).
5. Dolce, J.S. (2021) *Exploration of the skills gap: hype, perceptions, problem?* Northeastern University. Available at: https://doi.org/10.17760/D20439310.
6. Doucet, M. and Bélisle, M. (2024) 'Developing and Implementing a Competency-Based Veterinary Medicine Program at the Université de Montréal', *Journal of Veterinary Medical Education*, p. e20230172. Available at: https://doi.org/10.3138/jvme-2023-0172.
7. Hibrida, A.R. and Sunarni (2023) 'The Future of Work: Navigating the Challenges and Opportunities of Automation, Gig Economy, and Skills Evolution in a Post-Pandemic World', *West Science Interdisciplinary Studies*, 1(08), pp. 638–647. Available at: https://doi.org/10.58812/wsis.v1i08.186.
8. Hosseini, H. (2023) *Platform Economy 2023: U.S. leads; Europe lags.*, *Platform Economy 2023: U.S. leads; Europe lags.* Available at: https://www.platformeconomy.io/blog/platform-economy-2023-u-s-leads-europe-lags (Accessed: 19 September 2024).
9. Johnstone, S.M. and Leasure, D.E. (2015) 'How Competency-Based Education Can Fulfill the Promise of Educational Technology', in M. Antona and C. Stephanidis (eds) *Universal Access in Human-Computer Interaction. Access to Learning, Health and Well-Being*. Cham: Springer International Publishing (Lecture Notes in Computer Science), pp. 127–136. Available at: https://doi.org/10.1007/978-3-319-20684-4_13.
10. MacNutt, M. *et al.* (2024) 'The Development and Implementation of a Competency-Focused Curriculum in Health and Exercise Sciences', *Physiology*, 39(S1), p. 2243. Available at: https://doi.org/10.1152/physiol.2024.39.S1.2243.

11. Matache, I.C. (2023) 'HUMAN CAPITAL THEORY – ONE WAY OF EXPLAINING HIGHER EDUCATION MASSIFICATION', *Journal of Public Administration, Finance and Law*, 29, pp. 363–371. Available at: https://doi.org/10.47743/jopafl-2023-29-30.
12. McGreal, R. *et al.* (2022) 'Bridging the Gap: Micro-credentials for Development: UNESCO Chairs Policy Brief Form - Under the III World Higher Education Conference (WHEC 2021) Type: Collective X', *The International Review of Research in Open and Distributed Learning*, 23(3), pp. 288–302. Available at: https://doi.org/10.19173/irrodl.v23i3.6696.
13. Nimmagadda, B. *et al.* (2024) 'An Analytical study on Navigating Sustainability Challenges and Opportunities in the era of AI and the Gig Economy', *MATEC Web of Conferences*. Edited by K. Satyanarayana et al., 392, p. 01044. Available at: https://doi.org/10.1051/matecconf/202439201044.
14. Organised by: EUPHA-SSWH and Chair persons: Ute Bültmann (EUPHA-SSWH), Agnes Meershoek (Netherlands) (2022) '6.J. Workshop: Precarious employment and its impact on social protections in the EU', *European Journal of Public Health*, 32(Supplement_3), p. ckac129.374. Available at: https://doi.org/10.1093/eurpub/ckac129.374.
15. Sun, P., Yujie Chen, J. and Rani, U. (2023) 'From Flexible Labour to "Sticky Labour": A Tracking Study of Workers in the Food-Delivery Platform Economy of China', *Work, Employment and Society*, 37(2), pp. 412–431. Available at: https://doi.org/10.1177/09500170211021570.
16. Vyas, N. (2021) '"Gender inequality- now available on digital platform": an interplay between gender equality and the gig economy in the European Union', *European Labour Law Journal*, 12(1), pp. 37–51. Available at: https://doi.org/10.1177/2031952520953856.
17. Wheelahan, L. and Moodie, G. (2022) 'Gig qualifications for the gig economy: micro-credentials and the "hungry mile"', *Higher Education*, 83(6), pp. 1279–1295. Available at: https://doi.org/10.1007/s10734-021-00742-3.
18. Wheelahan, L. and Moodie, G. (2024) 'Analysing micro-credentials in higher education: a Bernsteinian analysis', *Towards Powerful Educational Knowledge*, pp. 70–86.
19. Xue, C., Tian, W. and Zhao, X. (2020) 'The Literature Review of Platform Economy', *Scientific Programming*, 2020(1). Available at: https://doi.org/10.1155/2020/8877128.
20. Yudie, C. (2019) 'The Influence of Platform Economy on the Development of Education Industry', in. *2019 International Conference on Emerging Researches in Management, Business, Finance and Economics (ERMBFE 2019)*, Shanghai, China.

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ALGORITHM OF LEGAL REGULATION OF INFORMATION AND ANALYTICAL ACTIVITIES OF THE NATIONAL POLICE OF UKRAINE

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Abstract: The article examines current issues of legal regulation of national information and analytical activities, which leads to the constant improvement of modern technology and a high level of digitalization of society, which in turn create new challenges and opportunities for law enforcement agencies.
The relevance of the topic lies in the fact that modern technologies and a high level of digitalization of society create new challenges and opportunities for law enforcement agencies. The National Police conducts information and analytical activities aimed at ensuring public safety, preventing crime, solving crimes and ensuring legal order. For the purpose of effective functioning of this activity, appropriate legal regulation is needed, which ensures legality, transparency and protection of citizens' rights.
The information and analytical activity of the National Police of Ukraine is a key component of its work. It covers the collection, processing, analysis and use of various information to ensure public order, combat crime and ensure the safety of citizens. Thanks to information and analytical activities, the police can effectively predict and prevent crimes, solve crimes faster and more efficiently, and also facilitate criminal prosecution.
Based on the results of the study, the main principles and methods of the information and analytical activities of the National Police of Ukraine were determined, as well as the creation of an algorithm of legal regulation of the information and analytical activities of the National Police of Ukraine and modern schemes and basic mechanisms of legal regulation of the information and analytical activities of the National Police of Ukraine were considered.
It is noted that the algorithm developed by the author for the legal regulation of the information and analytical activities of the National Police of Ukraine includes the determination of the purpose and tasks of the activity, the establishment of rules for the collection and processing of information, the development of internal legal acts and the protection of personal data of citizens, which in turn contributes to the provision of effective and legal performance of police functions in the field of information and analytical activities.
Keywords: algorithm, legal regulation, information and analytical activity, stages, National Police, Ukraine.
Classification JEL: K40

1. Introduction

Modern technologies and the high level of digitization of society create new challenges and opportunities for law enforcement agencies. The National Police conducts information and analytical activities aimed at ensuring public safety, preventing crime, solving crimes and ensuring legal order. For the purpose of effective functioning of this activity, appropriate legal regulation is needed, which ensures legality, transparency and protection of citizens' rights. The purpose of the article is a comprehensive analysis of current issues related to the construction of an algorithm for the legal regulation of the information and analytical

activities of the National Police of Ukraine and the improvement of theoretical and methodological research.

The object of the study is the legal regulation of the information and analytical activities of the National Police of Ukraine, as a component of the information and analytical activities of the Ministry of Internal Affairs of Ukraine.

The subject of the study is theoretical, scientific and methodological provisions and applied aspects of effective legal regulation of information and analytical activities of the National Police of Ukraine.

The methodological basis of the research is a system of general scientific and special methods of analysis: systematization and generalization (definition of the main categories, their relationship, formation of conclusions and proposals); monographic and system-structural analysis (to substantiate the tasks); constructive (determination of ways of development of legal regulation of information and analytical activities of the National Police of Ukraine, taking into account changes in interrelated factors); assessment-situational, graphic (visualization of theoretical research results, development trends of legal regulation of information and analytical activities of the National Police of Ukraine);

The normative basis of the study is the legislation of Ukraine (laws of Ukraine, secondary legal acts. The scientific-theoretical basis of the work is the theoretical-methodological developments and monographic studies of domestic and foreign scientists belonging to various scientific directions and cycles: jurisprudence, information technologies, and others.

2. Paper body

The information and analytical activity of the National Police of Ukraine is a key component of its work. It covers the collection, processing, analysis and use of various information to ensure public order, combat crime and ensure the safety of citizens. Thanks to information and analytical activities, the police can effectively predict and prevent crimes, solve crimes faster and more efficiently, and facilitate criminal prosecution. An important component of this activity is the analysis of the received information using modern methods and technologies, which allows obtaining an objective and reliable picture of the situation. Legal regulation of this activity is provided by a number of legislative acts that establish principles, procedures and requirements for the collection, processing and storage of information. The information and analytical activity of the National Police of Ukraine is a necessary component for ensuring law and order and security in the country.

The main principles of the information and analytical activities of the National Police of Ukraine are based on legality, objectivity and confidentiality. First of all, this activity is carried out in accordance with the requirements of the legislation that guarantees the rights and freedoms of citizens. Objectivity is an important principle, as information and analytical work should be based on objective data and facts, and not on personal preferences or views. Confidentiality of information is an integral part of this activity, as compliance with confidentiality ensures public trust and protects the rights and interests of citizens. In addition, the principles of professionalism and competence are important for ensuring quality information and analytical work. Information-analytical activity is also based on the principle of systematicity and complexity, since for the effective solution of tasks it is necessary to

analyze information from different sources and take into account different aspects of the situation. In general, compliance with these principles allows the National Police of Ukraine to ensure effective and objective work in the field of information and analytical activities..

The main methods of information and analytical activities of the National Police of Ukraine were developed taking into account modern technologies and methods of information analysis. First of all, it involves the collection and processing of a variety of information that comes from various sources, such as eyewitness accounts, operational data, crime statistics, etc. In addition, police analysts use various analytical methods and tools to identify patterns and trends in crime, such as data mining techniques, statistical models, geographic analysis, etc.

Another important method is conducting a risk-oriented analysis, when analysts identify objects or areas with a high risk of committing crimes and develop strategies to prevent them. Forecasting techniques are also used to predict possible events and risks arising in the field of law and order. An important component is information and analytical work on the Internet and social networks, where analysts monitor and analyze information about possible crimes, organizations of the criminal environment, and also interact with the public. Finally, an important component is cooperation with other law enforcement agencies and international partners, the exchange of information and experience makes it possible to fight crime more effectively, especially in the context of cross-border criminal networks.The main mechanisms of legal regulation of the information and analytical activities of the National Police of Ukraine are defined by a number of legislative acts and normative legal documents that establish the rules and procedures of police work in this area.First, it is the Law of Ukraine "On the Police", which defines the tasks, powers and principles of functioning of the National Police. It establishes rules for collecting, processing and storing information, as well as procedures for conducting analytical work to ensure law and order and the safety of citizens.In addition, an important mechanism is the resolutions of the Cabinet of Ministers of Ukraine, which regulate the organization of information and analytical activities of the National Police, establish the procedure for interaction with other authorities and exchange of information. Also, regulatory documents issued by the National Police itself, such as orders and instructions establishing specific rules for conducting information and analytical work, internal procedures and standards, are of great importance. In addition, the legal regulation of the information and analytical activities of the National Police of Ukraine corresponds to international standards and agreements that determine the rules for processing and protecting personal data of citizens.

Modern schemes of legal regulation of information and analytical activities of the National Police of Ukraine are based on a comprehensive approach to ensuring law and order and the safety of citizens. The main documents defining these schemes are legislative acts, regulatory documents and international standards. First, the Law of Ukraine "On the National Police" establishes the general principles and tasks of the police, as well as defines the basic rules for collecting, processing and storing information. This law establishes the basis for the functioning of information and analytical activities of the police and defines the rights and duties of police officers in this area. In addition, a role in legal regulation is played by the resolutions of the Cabinet of Ministers of Ukraine, which establish specific rules and procedures for conducting

information and analytical work. These documents determine the procedure for organizing police activities, interaction with other agencies, and information exchange.

A significant role in modern schemes of legal regulation is also played by the internal legal acts of the National Police, in particular orders and instructions that establish specific requirements and standards for conducting information and analytical work. In addition, modern schemes of legal regulation take into account international standards and agreements that determine the rules for the processing and protection of personal data of citizens. This avoids human rights violations and ensures compliance of police activities with international norms. All these elements form a system of modern schemes of legal regulation of information and analytical activities of the National Police of Ukraine, which contributes to ensuring the effective functioning of law enforcement agencies and ensuring the safety of citizens. In general, the mechanisms of legal regulation of the information and analytical activities of the National Police of Ukraine ensure the implementation of these activities within the framework of the law and taking into account the requirements for the protection of the rights and freedoms of citizens.

The algorithm of legal regulation of the information and analytical activities of the National Police of Ukraine includes several key stages, which are regulated in detail by relevant legislative acts and normative legal documents. The first stage is the determination of tasks and goals of the information and analytical activities of the police in accordance with the legislation. At this stage, the volume and nature of information that must be collected, analyzed and stored to ensure the safety of citizens and law and order is determined. The second stage is the establishment of rules for collecting, processing and storing information. This includes defining data collection procedures, using specialized software tools for data analysis, and establishing information retention periods. The third stage is the development and implementation of internal legal acts that regulate information and analytical activities. These documents establish specific rules and procedures for the work of the police in this area and ensure that their activities comply with the requirements of the law. The fourth stage is the provision of legal protection of personal data of citizens. According to Article 32 of the Constitution of Ukraine, every citizen has the right to protect his personal data, therefore it is important to establish mechanisms for the protection of this data during information and analytical work [1, 2]. In summary, the algorithm of legal regulation of the information and analytical activities of the National Police of Ukraine includes the determination of the goals and objectives of the activity, the establishment of rules for the collection and processing of information, the development of internal legal acts and the protection of personal data of citizens.

Conclusions

Therefore, the algorithm developed by the author for the legal regulation of the information and analytical activities of the National Police of Ukraine includes the determination of the goals and objectives of the activity, the establishment of rules for the collection and processing of information, the development of internal legal acts and the protection of personal data of citizens, which in turn helps to ensure effective and legal performance of police functions in the field of information and analytical activities.

References

1. Constitution of Ukraine (1996) available at: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text
2. Official Internet representation of the «President of Ukraine» (2024) available at: http://surl.li/uhubf

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FORECASTING AND DISTRIBUTION OF THE GREENHOUSE GAS EMISSIONS OF TÜRKİYE

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Abstract: A simple linear regression model is used to predict and forecast total greenhouse gas emissions. The parameters of the regression model are determined using maximum likelihood estimation method, assuming that the error terms follow an exponential power distribution. The grid search algorithm efficiently determines the shape parameter of this distribution, with a calculated value of 111.92, suggesting a tendency towards a uniform distribution of the observed values. The convergence of the exponential distribution of carbon emission data to a uniform distribution indicates collective behavior in the consumption of natural resources. Forecasts for the years 2023 and 2035 are provided for the total greenhouse gas emissions in Türkiye.
Keywords: economy, greenhouse gas emissions, energy, statistics, inference.
JEL Classification**:** Q50, Q54, H54

Introduction

Greenhouse gas (GHG) emissions have become a focal point in the global effort to combat climate change, as these emissions significantly contribute to the warming of our planet. Accurate forecasting of GHG emissions is essential for policymakers, researchers, and industries aiming to mitigate their environmental impact and comply with international climate agreements.

In recent years, various statistical and machine learning methods have been developed and refined to improve the accuracy of GHG emissions forecasts. These methods include traditional time series models like ARIMA (Auto Regressive Integrated Moving Average) and ETS (Exponential Smoothing State Space Model), which are commonly used for their robustness in handling seasonal variations and trends in data. More advanced techniques, such as the Prophet model and TBATS (Trigonometric, Box-Cox transform, ARMA errors, Trend, and Seasonal components), offer enhanced capabilities in capturing complex seasonal patterns and non-linearities, making them particularly useful in GHG emissions forecasting (Hyndman et al., 2008; Hyndman and Athanasopoulos, 2021; Brownlee, 2021; Taylor and Letham, 2017; Xu, etal., 2019). Additionally, the exponential power distribution can be applied to model the error

terms in these forecasts, providing a more flexible approach to handling the distribution of residuals, especially in the presence of outliers or heavy-tailed distributions (Mineo, and Ruggieri, 2005).

In this study, we estimate the regression parameters by first identifying the distribution of the observed data. GHG emissions, in particular, play a crucial role in maintaining, fixing, etc. that can inform policy decisions and contribute to the global efforts in reducing GHG emissions. The primary findings and forecasts are presented in Sections 1 and 2, respectively, while the final section offers discussions and conclusions based on the analysis in the paper. The results of this study will not only demonstrate the effectiveness of the method suggested but also offer insights into the future trajectory of GHG emissions in the region.

Section 1: Research methodology and computational process

The regression model can be used to forecast the energy consumption in the next years. The regression model is given by the following form:

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i, i = 1,2, \dots, n,$$

y and x are dependent and independent variables, respectively. ε_i is error term of the regression model and n is the number of sample size of data set.

If the observations from $y_1, y_2, \dots, y_n$ are assumed to be a member of a parametric model such as normal, Student t, etc. distributions, then the statistics which are functions of random variables are obtained according to these chosen parametric models. Likelihood function for a parametric distribution, i.e. f, the maximum likelihood estimation method is given by the following form for the regression case:

$$L(\boldsymbol{\beta}) = \prod_{i=1}^{n} f(y_i - x_i\boldsymbol{\beta}),$$

where $\boldsymbol{\beta} = (\beta_0, \beta_1)$ is a vector of parameters β_0 and β_1 in the regression model. The maximization of $L(\boldsymbol{\beta})$ the according to the parameters β_0 and β_1 will produce the maximum likelihood estimators $\widehat{\beta_0}$ and $\widehat{\beta_1}$ (Casella, G., and Berger, 2021; Mineo, and Ruggieri, 2005).

Since we are applying to the real data set, it is impossible to know what the true values of the parameters are. In order to solve the problem of the determination of the shape parameter of the exponential power distribution, the distance between the values of the observed variables and the predicted variables must be reduced as much as we can do. In order to obtain the reduced value for this distance, we can adjust the value of the tuning parameter and thus obtain the predicted values for the dependent variable of the regression model. We can use the method of grid search, which will be introduced in the research methodology in an algorithmic way (Woodward et. al., 2017; Strickland, 2015; Ghatak, 2019):

1. Set values for the constant
2. Set a sequence of values for the constant defined previously
3. Try the values provided by the sequence in the Step 2
4. Get values of the errors defined as difference between predicted and observed values
5. Find the minimum values among the error values obtained by the tried values of the shape parameter p.

6. Terminate the procedure and provide the value of p determined according to the minimum value of errors

It should be noted that focusing only on the regression model is not a sufficient approach for forward-looking forecasting. At the same time, focusing on the distribution of observations, i.e. the distribution of error terms representing the dependent variable y, also improves the success of forward-looking forecasts. In this study, we have chosen to focus on the distribution of observations in favor of the distribution of errors.

Section 2: Main results

This section presents the scatterplot, regression model parameter estimates and statistical significance of the full regression model. A scatter plot comparing the independent variable "years" with the dependent variable "GHG emissions" is a valuable tool for identifying suitable regression model to establish the relationship between these variables (refer to Figure 1, Internet access, 08/29/2024).

Once the appropriate regression model is selected, its parameters should be estimated using the maximum likelihood estimation method, particularly when the error terms follow an exponential power distribution. The overall statistical validity of the regression equation is then assessed through ANOVA (refer to Table 2).

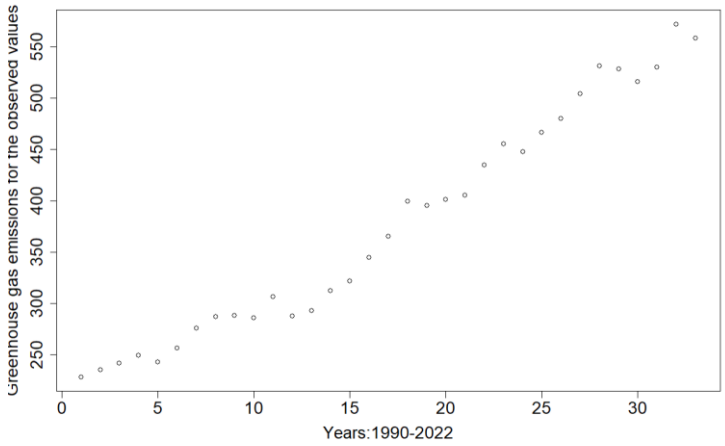

Figure 1. Years and GHG emissions for the observed values from official website of Turkish statistical institute (Internet access, 08/29/2024)

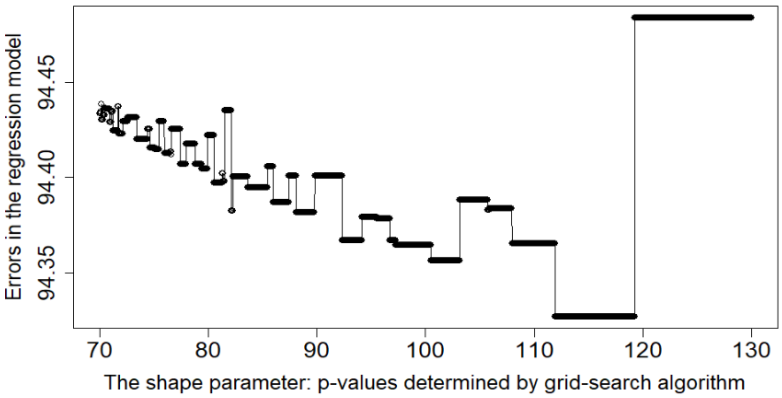

Figure 2. The absolute value of the errors defined as a difference between the predicted values of y and the observed values of y

Figure 2 illustrates the outcomes of the grid-search algorithm applied to identify the optimal value for the shape parameter of the exponential power distribution. In other words, when Figure 2 is analysed, it is seen that the value of the shape parameter p takes the smallest error value around 111. Note that other p-values were also tried, however, the smallest error value in the simulation run was found at the respective p-values at the interval [70,130] at Figure 2, according to the updated p-value.

Table 1. The estimates and ANOVA for full model

	The of estimates of parameters		Sum of Squares	Mean of Squares	F-test and its p-value
$\widehat{\beta_0}$	372.6	Regression	SSR: 373053	MSR: 373053	MSR/MSE: 983.49 and $2.2\ 10^{-16}$
$\widehat{\beta_1}$	614.1	Error	SSE: 11759	MSE: 379	

Table 1 shows that the full model is statistically significant. It is reasonable to observe the simple linear regression which can be illustrated by Figure 1 with error terms, because when Figure 1 showing the scatter plot of years GHG emissions is examined, it is observed that there can exist a general linear trend.

Section 2.1: Forecasting of the Greenhouse gas emissions

Since the simple linear regression model has been used to fit the observed data, the predicted values show that there is a linear trend in the future prediction. Note that since the main motivation for the prediction should also be the distribution of the error terms in the regression model, different regression models cannot be preferred for forecasting. On the other hand, it is important to note that the assumed regression model for the fitted dataset cannot play a more important role in some sense; in our research methodology, we have focused on the distribution of error terms; thus, the sum of errors of the predictions has been tried to be decreased until the optimal value of shape parameter p is determined. Furthermore, if the distribution of errors can be identified, then the general tendency or distribution of the observations can be clarified as well.

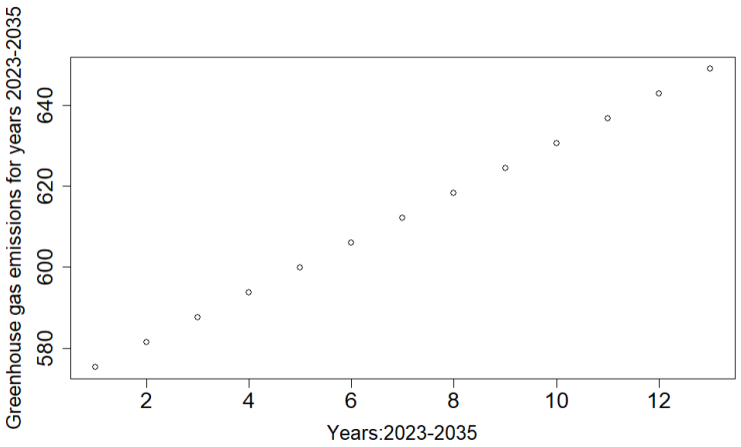

Figure 3. Forecasted values for the years 2023-2025

According to Figure 3, it is observed that there is a linear increment and the value at year 2025 will be 648.9709.

Discussion and conclusions

The simple linear regression model has been used to predict and forecast total GHG emissions. The parameters of the regression model could be determined by using the maximum likelihood estimation method when the distribution of the error terms is assumed to be exponential power distribution. The proposed method, which uses the grid search algorithm, provides a method for determining the value of the shape parameter of the exponential power distribution. The determined value of the shape parameter is 111.92, which shows that the distribution of observed values generally tends to uniform distribution. In the social part of science, we can see from the convergence of the exponential distribution of carbon emission data to a uniform distribution that people act in concert in consuming natural resources at will. The estimates of regression model were used to forecast the years 2023 and 2035 for total GHG emissions in Türkiye.

References

1. Hyndman, R. J., Koehler, A. B., Ord, J. K., and Snyder, R. D. (2008). Forecasting with Exponential Smoothing: The State Space Approach. Springer. https://doi.org/10.1007/978-3-540-71918-2
2. Hyndman, R. J., and Athanasopoulos, G. (2021). Forecasting: principles and practice (3rd ed.). OTexts. https://otexts.com/fpp3/
3. Brownlee, J. (2021). How to Create an ARIMA Model for Time Series Forecasting in Python. MachineLearningMastery.com. Retrieved from https://machinelearningmastery.com/arima-for-time-series-forecasting-with-python
4. Taylor, S. J., and Letham, B. (2018). Forecasting at scale. The American Statistician, 72(1), 37-45.
5. Casella, G., and Berger, R. L. (2021). Statistical inference. Cengage Learning.
6. Mineo, A., and Ruggieri, M. (2005). A software tool for the exponential power distribution: The normalp package. *Journal of Statistical Software*, *12*, 1-24.
7. Du, Y.B., Yi, Q., Li, C.B., Liao, L., (2015). Life cycle oriented low-carbon operation models of machinery manufacturing industry. *J. Clean. Prod.*, 91, 145-157.
8. Ghatak, A. (2019). Deep learning with R (Vol. 245). Singapore: Springer.
9. Xu, N., Ding, S., Gong, Y., & Bai, J. (2019). Forecasting Chinese greenhouse gas emissions from energy consumption using a novel grey rolling model. *Energy*, *175*, 218-227.
10. https://data.tuik.gov.tr/Kategori/GetKategori?p=Cevre-ve-Enerji-103, Web, 08/29/2024.
11. Strickland, J. (2015). Predictive analytics using R. Lulu. com.
12. Woodward, W. A., Gray, H. L., & Elliott, A. C. (2017). Applied time series analysis with R. CRC press.

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EVALUATION OF CURRENT STUDIES ON ECONOMICS AND FINANCING POLICIES IN HEALTH MANAGEMENT

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Abstract: One of the most important elements of health services management is to ensure the sustainability of services. In this context, the economic sustainability of health services and the development of policies for the financing of health services come to the fore. The aim of this research is to identify current research topics in economics and financing policies in health management. Within the scope of the research, open access international articles published in the last five years were searched by searching the keywords "health management" or "healthcare management" or "health care management" or "health administration" or "health care administration" or "healtcare administration" AND "economy" or "economics" or "finance" or "financing" AND "policy" or "politics" in the subject title on the Web Of Science database, and 58 articles that were found to be about economic and financing policies in the field of health management were subjected to content analysis. As a result of the research, it was determined that researches were conducted on "Policy development in health" (16) and "Financing in health" (14) and on the themes of "Economic effectiveness in health services" (11) and "Ensuring Financial Sustainability of Health Services" (8). In the analysed articles, while most of the evaluations are made on the basis of documents, studies on bureaucrats and health administrators come to the forefront in general. Health financing performance is important in terms of providing sustainable resources for health services. The prominence of financing studies for health services as a result of this research supports this situation. Likewise, emphasising the necessity of developing health policies to ensure inclusive service provision in health and to prevent inequality in health reveals the importance of this research.

Keywords: Helath policy, Health economy, Health services, Health management, Helath financig policy
JEL Classification: I11, I18

Introduction

Health services refer to all services that begin with the protection of the health of the individual, continue with the treatment of disability or illness and post-treatment rehabilitation services, and aim to increase the health level of the entire society. In all service branches evaluated within

the scope of health services, the service must be provided efficiently, effectively and efficiently. In order to achieve all these, the control of resources used in health services is important. The field of health management has emerged to ensure effective and efficient management of health services. In health services, human resources and financial resources are the most important elements. The use of financial resources in health services and the most efficient use of these resources are important for the sustainability of services.

The determination of financial resources to be used within the scope of health services, provision of necessary financing from relevant resources and policies to be developed for these constitute the subject of health economics (Çalışkan, 2008). Increasing costs in the field of health have made it a necessity to meet these costs. This situation is quite challenging for both countries and individuals. In this context, health economics is considered as producing optimum level of health services with the scarce resources allocated to health services and ensuring the fair distribution of this service. Studies in the field of health economics generally focus on ensuring fair access to health services and effective health service delivery. In this context, the basic element of health economics is the prioritization of services to be provided in the use of scarce resources allocated to health services. At the same time, health economics is a branch of science focused on the production, distribution and consumption of health services (Barbu, 2022).

In the report published by the World Health Organization in 2019, it was emphasized that cost effectiveness would decrease the quality of health services and increase resource waste if cost effectiveness could not be achieved (WHO, 2019). In today's conjuncture, inequality in health services has become a significant problem. According to OECD data, access to health services in low-income countries is considerably lower compared to middle and upper-income countries. This situation reveals social inequalities in health services (OECD, 2020). Health management and health economics contribute to the development of the necessary policies to eliminate these inequalities. Therefore, it would not be wrong to say that health economics and financing policies have an important role in ensuring the sustainability of health services and ensuring effective health service delivery. While health economics aims to use the scarce resources allocated by policy makers to be used in health services in the most efficient way, financing policies regulate the fair distribution of these scarce resources. Health economics and financing policies work together to meet the costs incurred in health services, to provide effective cost control and to facilitate access to quality health services.

Benefiting from health services is a human right. In this context, the duty of the state is to enable its citizens to live healthily. For this reason, health services should be provided without interruption. Creating economic resources plays a major role in the continuity of health services without interruption. Governments should develop a financing policy that is suitable for both their own budgets and the budget and lifestyle of the citizens and ensure that all citizens have uninterrupted and fair access to health services. Therefore, financing policies in health are an important factor in ensuring access to health services (Lagarde *et al.*, 2018).

Financing models vary between countries, but are generally based on tax-based systems, social insurance programs, or private insurance models. Each model has its own advantages and disadvantages; for example, tax-based systems provide free health services with equity and pursue a financing approach that is in line with the concept of equality. However, since the

entire financial burden is covered by the government budget, it creates difficulties in terms of financial sustainability (Evans *et al.*, 2013). The social insurance model or social health insurance model seems more equitable because the share to be allocated to health services is clearly determined and it is based on the concept of receiving premiums according to income. However, this model can also create negative effects in terms of employment while providing the service. While private health insurances reduce the economic burden of health services on the state, they are a very problematic method in terms of equality and justice. In this model, high-income individuals can benefit from more health services.

The ever-increasing population worldwide also increases the financial burden of health services to be provided to this population. Therefore, policies aimed at creating economic resources in health services are important not only economically but also in terms of human resources and infrastructure for health facilities (Smith *et al.*, 2010). In addition to developing policies for health expenditures, the objectivity and transparency of the developed policy should also be taken into account. If the aforementioned transparency cannot be provided and an accountable system is not established, the perception of trust and quality in health services will weaken (Mills, 2014). Health economics and financing policies are critical for the efficiency and sustainability of health systems. Efficient use of resources, equal access to health services for all and proper management of financing policies will improve the quality and sustainability of health services.

In the light of all these evaluations, the researches on economy and financing in the management of health services and the policies developed will also reveal the future perspective. In this direction, this study aims to analyse the recent scientific researches on economics and finance in health care management, to analyse the current discussion topics in this field, to reveal new research areas and to guide policy makers.

Method

Within the scope of the research, in order to identify current researches in the field of health management regarding health economics and financing policies, the following keywords were searched in the Web of Science database under the topic; "health management" or "healthcare management" or "health care management" or "health administration" or "health care administration" or "healthcare administration" AND "economy" or "economics" or "finance" or "financing" AND "policy" or "politics".

Among the identified articles, open access articles were preferred. The year limitation was set as 2019-2024 (first 8 months). In this context, 58 articles were obtained and included in the sample. Among the articles included in the sample, 5 were removed from the sample because they were published on topics outside the field, and the remaining 53 articles were subjected to content analysis. Within the scope of content analysis, the articles included in the sample were analyzed by creating categories such as subject, theme, research method used in the research and sample.

Findings

As a result of the research and content analysis, it was determined that there have been publications on economic and financing policies in the field of health management in 30 different countries in the last 5 years. There are also publications that concern all countries and are evaluated in general.

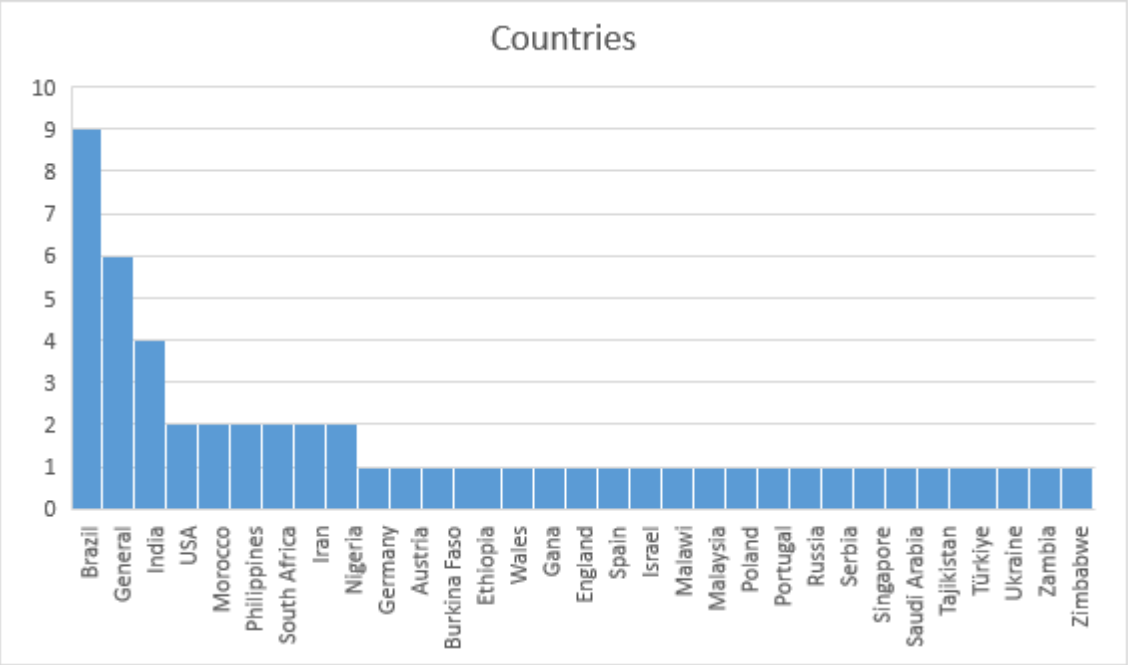

Figure 1 Countries

When the figure above is examined, it is determined that the highest number of publications were made in Brazil (9). Similarly, countries such as India (4), USA (2), Morocco (2), Philippines (2), South Africa (2), Iran (2) and Nigeria (2) are other countries that focus on economic and financing policies in health management. When the relevant countries are examined, it will be seen that developing countries focus more on economic and financing policies in health.

The issues emphasized and highlighted in current research on economic and financing policies in health management are listed in the table below.

Table 2 Example of the construction of one table

Issues	Frekans (f)	Percentage (%)
Policy Development in Health	16	30,19
Financing in Health	14	26,42
Cost of Health Services	7	13,21
Health Services Management	4	7,55
Access to Health Services	3	5,66
Health Education	2	3,77
Health Service Delivery	2	3,77
Health Economics Education	1	1,89
Health Entrepreneurship	1	1,89
Digitalization in Health	1	1,89
Management of Decision Making Processes in Health	1	1,89
Sustainable Development Goals	1	1,89

When Table 1 is examined, it is determined that health policy development (16) and health financing (14) are the most researched and discussed topics. In addition, Cost of Health Services (7), Health Services Management (4), Access to Health Services (3), Health Education (2), Health Service Delivery (2) are other prominent topics. In this context, it is seen that current

research focuses on developing new policies for the use and increase of financial resources in health, creating new financing for health services, controlling costs and ensuring individuals' access to health services. In this context, it is seen that current research focuses on developing new policies for the use and increase of financial resources in health, creating new financing for health services, controlling costs and ensuring individuals' access to health services.
When we look at the details of the topics focused on in current studies, we see that there are studies in 20 sub-themes related to these topics.

Tablo 2. Themes

Themes	Frekans (f)	Percentage (%)
Economic efficiency in health services	11	20,75
Ensuring financial sustainability of health services	8	15,09
Effectiveness of health policies in times of crisis	5	9,43
Capacity utilization in health services	5	9,43
Reflections of politics on health	4	7,55
Equal access to health services	3	5,66
Improvement of emergency health services	2	3,77
Performance-based payment system	2	3,77
Elderly health and its place in health policies	2	3,77
Primary health care services	1	1,89
The economic burden of employee health	1	1,89
Awareness of e-health practices	1	1,89
Public private partnership	1	1,89
Decision support systems	1	1,89
Graduate education in health economics	1	1,89
Privatization in health services	1	1,89
Ensuring affordable access to health services	1	1,89
Introducing economic policy to health care	1	1,89
Health ınsurance	1	1,89
Public expenditures on health	1	1,89

The issues examined in current studies on economic and financing policies in health management have been evaluated on the themes of economic effectiveness in health services (11), ensuring financial sustainability in health services (8), capacity utilization in health services (5) and effectiveness of health policies in times of crisis (5). In this direction, it is possible to say that studies on economic and financing policies in health emphasise the effective use of resources allocated to health services and the transfer of financial resources to services without interruption. In addition, since the focused date range (2019-2024) within the scope of this research covers the Covid-19 pandemic period, it has been determined that the studies focused on the economic sustainability of health services in times of crisis, the effective use of existing capacity and the development of policies appropriate for crisis moments.
The preferred sampling distribution in the articles examined within the scope of the research is given in the table below.

Table 3. Sample

Sample	Frekans (f)	Percentage (%)
Documents	21	39,62
Bureaucrats	5	9,43
Health Managers	4	7,55
Academics	2	3,77
Patients	2	3,77
Entrepreneurs	1	1,89
Policy Makers / Politician	1	1,89
Health Information System Data	1	1,89
Health Service Users	1	1,89
Health Organization Representatives	1	1,89
Health Professionals	1	1,89
Local citizen	1	1,89

According to Table 3, researches conducted on documents (21) are more common in the articles subject to the research. The reason for this is the focus on statistical data on economy and finance. In addition, there are articles based on research conducted on bureaucrats (5) because they are policy makers, health managers (4) because they manage financial resources in health, academics (2) because they help establish the scientific infrastructure, and patients (2) because financial and administrative situations are likely to be affected.
The table showing the research methods used in the analysed articles is given below.

Table 4. Methods

Methods	Frekans (f)	Percentage (%)
Quantitative	23	43,40
Qualitative	14	26,42
Literature Review	10	18,87
Mixed	6	11,32

The majority of the articles included in the evaluation consist of studies utilising quantitative (23) research methods based on numerical data and statistical evaluations. In addition, there are articles in which qualitative (14) research method is used in which the opinions of various sample groups are utilised. In addition, there are some studies using literature reviews (10) and mixed (6) methods.

Conclusion

As a result of the research, it has been determined that current studies on economic and financing policies in the field of health management have been conducted on the effective and efficient use of financial resources. Likewise, it has been observed that current studies focus on obtaining financial resources to be used in health services and ensuring their financing. In addition, it was concluded that the policies developed and to be developed on these situations were included. This makes it possible to say that the new trend in health care management today is policy development for the creation and management of financing resources. In addition, studies have shown that there are countries with relatively weak economies that are generally

classified as developing countries. This situation is an indicator of the problems these countries face in financing health services. It is recommended that future research focus on access to health care, health inequalities and financial sustainability in developing countries.

References

1. Evans DB, Hsu J, Boerma T. Universal health coverage and universal access. Bull World Health Organ. 2013 Aug 1;91(8):546-546A. doi: 10.2471/BLT.13.125450. PMID: 23940398; PMCID: PMC3738317.
2. Lagarde M, Palmer N. The impact of health financing strategies on access to health services in low and middle income countries. Cochrane Database Syst Rev. 2018 Apr 11;2018(4):CD006092. doi: 10.1002/14651858.CD006092.pub2. PMCID: PMC6494435.
3. Mills, A. 2014. Health systems in low- and middle-income countries. The Oxford handbook of health economics.
4. OECD., 2020. Health at a Glance 2020: OECD Indicators. OECD Publishing.
5. Smith, P., Mossialos, E., Papanicolas, I., & Leatherman, S., 2010. Performance measurement for health system improvement: Experiences, challenges, and prospects. Cambridge University Press.
6. WHO., 2019. The World Health Report: Health Systems Financing: The path to universal coverage. World Health Organization.
7. Çalışkan, Z., 2008. Sağlik Ekonomisi: Kavramsal Bir Yaklaşim. Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 26(2), 29-50.
8. Barbu L. Global trends in the scientific research of the health economics: a bibliometric analysis from 1975 to 2022. Health Econ Rev. 2023 May 12;13(1):31. doi: 10.1186/s13561-023-00446-7. PMID: 37171506; PMCID: PMC10176285.

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WAR-DRIVEN INTERREGIONAL TRANSFORMATIONS OF THE UKRAINIAN LABOR MARKET

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Abstract: The purpose of the article is to reveal the modern transformations of the labor market in the Ukraine's regions under the impact of the Russian-Ukrainian war. The subject of the study is transformational shifts in the regional labor markets of Ukraine caused by the ongoing war. The research was conducted using comparison of two labor supply structures in the Ukraine's regions based on the Spearman's rank correlation coefficient and the uneven distribution coefficient. The gender structure of the labor supply, as well as the structure of labor supply in terms of urban and rural unemployed populations, was analyzed using the J_R criterion for assessing the significance of differences between those two structures. It was found that there have been significant structural shifts in the regional labor supply structure, primarily due to alterations in the indicators of frontline communities and in the capital city with Kyiv region, which have experienced a substantial influx of internally displaced persons. A comparative analysis using the coefficient of inequality distribution revealed a growing asymmetry in unemployment rates between 2014 and 2023, driven by population displacement. Gender analysis of the labor supply indicated a high degree of similarity across two-thirds of the regions. There was no stark contrast between the datasets. An assessment of the labor supply structure disaggregated by urban and rural unemployment showed a growing disproportionality in the labor supply structure based on these parameters. The changes in the regional structure of labor demand, caused by military actions, have been revealed.
Keywords: labor market, labor supply, labor demand, transformation, Ukrainian population, wartime.
JEL Classification: D81, J21, J23, O15, R23.

Introduction

Modern transformational shifts in Ukraine's labor market are accompanied by radical institutional, territorial, sectoral, gender, age, and professional-qualification changes, which have taken on a spontaneous nature during the wartime period. Given the instability in the labor market and the increasing migration, it leads to a further exacerbation of the regional imbalance of labor supply and demand. In 2023, the number of applicants per vacancy ranged from 22 unemployed per one workplace in the Zaporizhzhia region to 2 vacancies per unemployed person in the Lviv region (State Employment Service, 2024). Under the conditions of significant wartime risks and the catastrophic reduction of human potential, disproportionate labor market transformations pose a threat to national security, particularly in terms of staffing critically important enterprises and upholding social standards and guarantees in the labor sphere.

The purpose of the article is to assess the contemporary transformation of the labor market in Ukrainian regions as influenced by the Russian-Ukrainian war. To achieve this goal we will analyze current trends in labor supply and demand in Ukrainian regions and substantiate the specific features of labor market transformations during the wartime period. The object of our research is regional labor markets, while the subject is the transformational shifts in Ukrainian regional labor markets during the war period.

Research Methods

The study was conducted using a systemic approach, dialectical methods (analysis and synthesis, recognition of contradictions as internal driving forces, trial and error method), techniques of abstraction and generalization, functional and comparative analysis, statistical methods and data analysis. For instance, a comparison of two labor supply structures in Ukrainian regions in 2014 and 2023 was conducted using Spearman's rank correlation coefficient and the coefficient of inequality. Analysis of the gender structure of labor supply was carried out using the J_R criterion scale to assess the significance of differences between the two structures (Formula 1). The calculation of the significance indicator of structural differences using this formula is based on the ratio of the actual measure of discrepancies in the values of the elements of the two structures to their maximum possible value. This formula not only allows us to assess structural shifts but also the degree of disproportionality of the gender structure of labor supply.

$$J_R = \sqrt{\frac{\sum_{i=1}^{n}\left(d_{2_i} - d_{1_i}\right)^2}{\sum_{i=1}^{n}\left(d_{2_i} + d_{1_i}\right)^2}} \quad (1)$$

where d_{1_i} – specific weight of the *i*-th element of the structure of the first aggregate;

d_{2_i} – specific weight of the *i*-th element of the structure of the second aggregate;

n – population size;

i – number of the population's element.

Spatial transformations of labor demand were analyzed using methods of analysis and synthesis, abstract-logical methods, the comparative method, and the graphical method. The

assessment of transformational shifts in regional labor markets in Ukraine was conducted based on the State Employment Service data, which allowed for the study of the structure of labor supply from 2014 (the beginning of the military conflict) to 2023 and the analysis of the regional structure of labor demand (State Employment Service, 2024; State Statistics Service of Ukraine, 2015).

Results and Discussion

The ongoing war within the country's communities has significantly weakened previously established social connections in local labor markets due to changes in the structure of labor supply and demand. Current transformational shifts are characterized by radical changes that exacerbate interregional disparities in this area. In the context of acute wartime risks and a catastrophic decline in human potential, these disparities threaten national security in terms of staffing critical enterprises and the ability to maintain social standards and guarantees. The Russian-Ukrainian war has led to fundamental transformations of the labor market in Ukrainian regions, driven by:

– transformations in the economy structure, which have heightened imbalances in labor demand; the destruction and relocation of enterprises and the reduction of production volumes due to the blockade of transport routes, have narrowed the scope of employment while simultaneously contributing to the creation of jobs in safer regions. 3.5 million jobs were lost in the first year of the war (Government portal, 2024), and according to the International Labor Organization, this figure could reach 43.5% of all jobs during the war (The impact of the Ukraine, 2022);

– an increase in mortality rates, a decline in birth rates, and intensified external migration have significantly weakened the country's labor potential and exacerbated the imbalance in the age structure of the workforce. As of January 1, 2024, 6.3 million Ukrainians had migrated, with women and children comprising 87% of this figure. Notably, 70% of Ukrainian women migrants in the EU are highly educated, representing a significant potential labor force. However, the risk of losing this valuable human capital is high, given that a quarter of migrants don't plan to return (Institute for Demography and Life Quality Problems, 2024; Yehorova, 2023);

– intensified internal migration, which has complicated the balanced development of local labor markets, causing a redistribution of labor resources and a shortage of skilled workers. As of January 1, 2024, 4.9 million internally displaced persons (IDPs) were registered in Ukraine, mainly citizens from frontline and border areas; the largest number of them were received by the territorial communities of Dnipropetrovsk, Kyiv, Kharkiv, Poltava regions, and Kyiv;

– demand for military-liable citizens by the Armed Forces of Ukraine, which has increased the imbalance in the gender structure of the workforce. In 2023, the share of men in the unemployed population was 28.0%, which is 17.4 percentage points less compared to 2014.

In 2023, the unemployment rate in Ukraine was 21.1% of the population according to the International Labour Organization methodology, which is due to disproportions in the demand for labor force and its supply, uneven economic recovery of territorial communities, the scale of losses and damages. A comparison of the labor supply structures in communities of

Ukrainian regions between 2014 and 2023 based on Spearman's rank correlation coefficient (0.178) confirmed the presence of significant shifts (Table 1), which occurred mainly due to changes in the indicators of frontline communities (Luhansk, Donetsk, Sumy regions), as well as in Kyiv and Kyiv region communities as areas hosting a large number of IDPs, against the background of minor changes in communities of Zakarpattia, Chernivtsi and Ivano-Frankivsk regions.

Table 1 Distribution of territorial communities of Ukrainian regions by shifts in the labor supply structure, 2014-2023

Intervals of values	Characteristics of structural differences	Territorial communities of regions
0.1 – 50.0	Minor shifts	Cherkasy, Chernihiv, Chernivtsi, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytskyi, Kirovohrad, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zhytomyr
50.1 – 98.0	Moderate shifts	Sumy, Zaporizhzhia
98.1 – 147.0	Substantial shifts	Kyiv, the city of Kyiv
147.1 – 196.0	Significant shifts	Donetsk, Luhansk

Source: authors own study based on the SES data (State Employment Service, 2024)

A comparative analysis of the labor supply structure for 2014 and 2023, conducted using the uneven distribution coefficient, indicates an increase in the asymmetry of the distribution of the unemployed population. However, calculations based on statistical data on officially registered unemployment show the dominance of the opposite trend, i.e., an even distribution of labor supply across Ukraine, which does not correspond to actual trends in this field. It is important to note that the indicators of officially registered unemployed individuals do not fully reflect labor market trends for various reasons, mainly due to the distrust of employment centers as an institution for job placement, especially among the male population. Between 2014 and 2023, the number of men with officially registered unemployed status decreased fivefold; their share among the unemployed during this period dropped from 45.4% to 28.0% by the end of the study period, primarily due to the impact of the war. In 2023, the labor supply of women exceeded that of men by 2.6 times.

When evaluating the gender structure of labor supply using the J_R criterion scale to assess the degree of significance of differences between two structures, it is important to note the existing regional differences. The results of the assessment of calculated values indicate complete identity in values for two-thirds of the regions and the absence of complete structural opposition. The distribution of regions by value ranges allowed the formation of three groups: 0.000–0.030; 0.031–0.090; 0.091 and above (Table 2).

Table 2 Distribution of Ukraine's regions by the criterion of differences in the regional structure of labor supply by gender, 2023

Intervals of values J_R	Characteristics of structural differences	Region
0.000 – 0.030	Identity of structures	Vinnytsia (0.024), Lviv (0.023), Chernihiv (0.021), Ternopil (0.021), Cherkasy (0.020), Volyn (0.019), Ivano-Frankivsk (0.017), the city of Kyiv (0.015), Poltava (0.014), Kyiv (0.013), Chernivtsi (0.009), Kharkiv (0.008), Zhytomyr (0.008), Rivne (0.005), Dnipropetrovsk (0.004), Sumy (0.004), Khmelnytskyi (0.003), Mykolaiv (0.000)
0.031 – 0.090	Low level of differences	Odesa (0.042), Kirovohrad (0.041), Donetsk (0.040), Zakarpattia (0.032)
0.091 – and above	Significant level of differences	Kherson (0.158), Zaporizhzhia (0.111), Luhansk (0.093)

Source: authors own study based on the SES data (State Employment Service, 2024)

The value range with an interval of 0.000–0.030 forms the first group, which includes 18 regions characterized by structural identity with the national average indicator. The regions in this group are distinguished by labor market flexibility, a mobile workforce, adaptability to crisis conditions, and developed infrastructure. The development priorities for this group of regions include the productive utilization of business relocation potential and IDPs, the development of the entrepreneurial sector, and social interaction to mitigate the risks of the wartime period.

The second group (range 0.031–0.060) consists of four regions with a low level of deviation from the national average indicator. These are mostly regions with the lowest proportion of men among the unemployed population in the country (Odesa region – 23.3%, Kirovohrad – 23.5%, Zakarpattia – 24.4%) and a pronounced territorial or economic specificity. The development priorities for the territorial communities in these regions include enhancing financial capacity, restoring production and infrastructure facilities, and developing the entrepreneurial sector (Sova, 2023). A balanced local policy based on cohesion, solidarity, and mutual trust should counteract the fragmented social capital that is formed by closed networks, deepening the social divide among community members (Zvonar et al., 2023).

The third group (range 0.091 and above) includes Zaporizhzhia, Luhansk, and Kherson regions, which differ significantly from the national average and are characterized by a shrinking labor market due to their proximity to the frontline. According to data from the State Employment Service of Ukraine, the number of applicants per vacancy in the Zaporizhzhia and Kherson regions on January 1, 2024, was the highest among the country's regions, at 22 and 20 job seekers per vacancy, respectively. This is due to the limited employment opportunities for the unemployed population resulting from the closure of several enterprises and the high risks of conducting entrepreneurial activities. The development priorities for this group of communities are the restoration and revitalization of entrepreneurial activity to revive the community economy and labor market, ensure safe living conditions, preserve the community's human potential, and reduce social tension (Zaiats et al., 2024).

When evaluating the labor supply structure in terms of urban and rural unemployed populations using the J_R criterion scale for assessing the significance of differences between the two structures, we can observe an increase in the disproportionality of the labor supply structure by these parameters (Figure 1). As a result of the analysis, four groups were formed, with the first group (range 0.000–0.030) consisting of 5 regions (Kyiv, Kirovohrad, Lviv, Mykolaiv, and Poltava), which are characterized by structural identity with the national average indicator, meaning that the proportion of urban and rural unemployed populations is close to the national average – 59.9% and 40.1%, respectively. The main priorities of local development policy for the first group are increasing the capacity of territorial community labor markets to accumulate and productively utilize the labor potential of economically active local populations and IDPs. The second group (range 0.031–0.070) consists of seven regions, whose level of deviation from the national average is very low. The communities in these regions are characterized by a predominance of urban unemployed populations over rural ones, with all regions being border areas, and four of them (Zaporizhzhia, Luhansk, Kharkiv, and Kherson) are active combat zones. This situation restricts employment opportunities and narrows the labor market. The local development priorities for this group include supporting the social adaptation of IDPs, enabling the realization of their labor potential in recipient communities, creating economic opportunities to improve the living standards of socially vulnerable categories of the economically active population, and developing housing markets and transportation to enhance labor mobility.

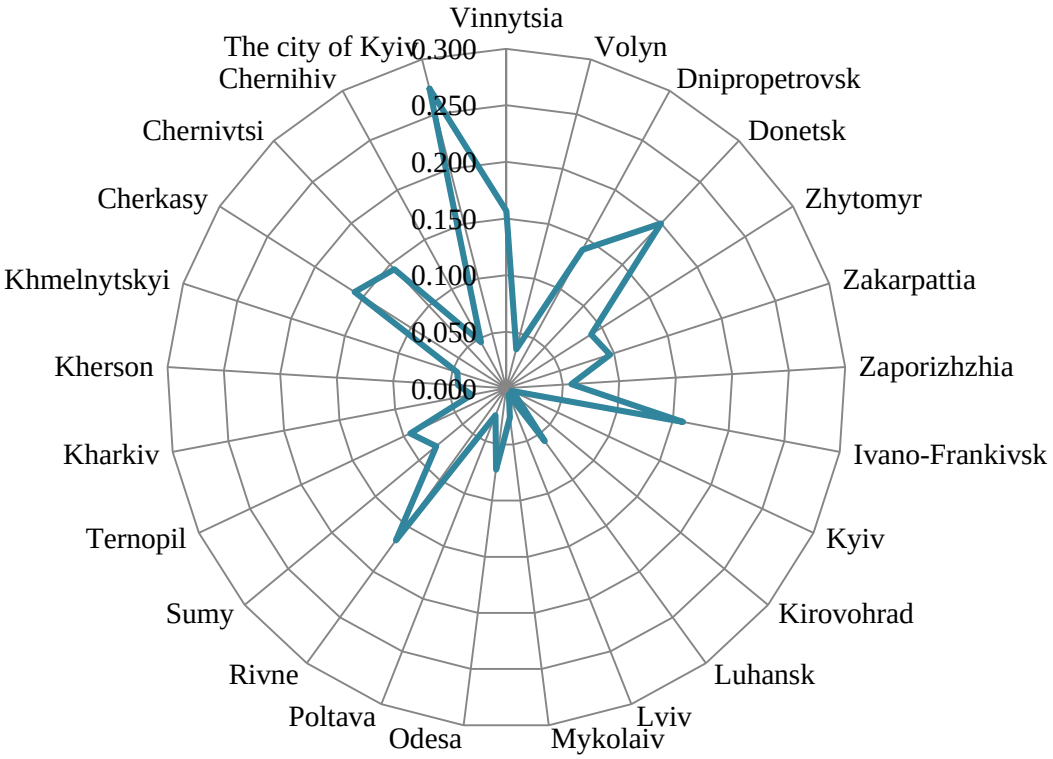

Figure 1 Distribution of Ukraine's regions according to the structure of labor supply (urban and rural unemployed population), 2023

Source: authors own study based on the SES data (State Employment Service, 2024)

The third group (range 0.071–0.150) includes seven regions, which have a low level of deviation from the national average and are characterized by a higher proportion of urban population among the unemployed. In Dnipropetrovsk region, for example, the share of the urban population is 74.7%, while in Sumy it is 68.2%. The key development policy priorities for this group include attracting the necessary qualified labor force to territorial communities, reducing long-term unemployment and informal employment, and staffing social sector institutions, particularly in healthcare and education.

The fourth group (range 0.151–0.300) consists of six regions with a significant deviation from the national average. Four of them (Vinnytsia, Ivano-Frankivsk, Rivne, and Cherkasy) have a higher proportion of rural population among the unemployed than the national average, while the other two – Kyiv and Donetsk regions – exceed the national average urban unemployment rate by 1.5 and 1.4 times, respectively. The development priorities for this group focus on creating productive jobs, fostering the growth of small and medium-sized businesses, and legalizing informal employment.

The regional structure of labor demand has changed dramatically under the influence of military actions, the destruction of production and infrastructure facilities, the intensification of migration processes, and significant human losses. A regional polarization of the labor market has essentially occurred: top regions in the growth of their share of labor demand are concentrated predominantly in the right-bank part of the country, while the leaders in declining shares are mainly on the left-bank side (Figure 2).

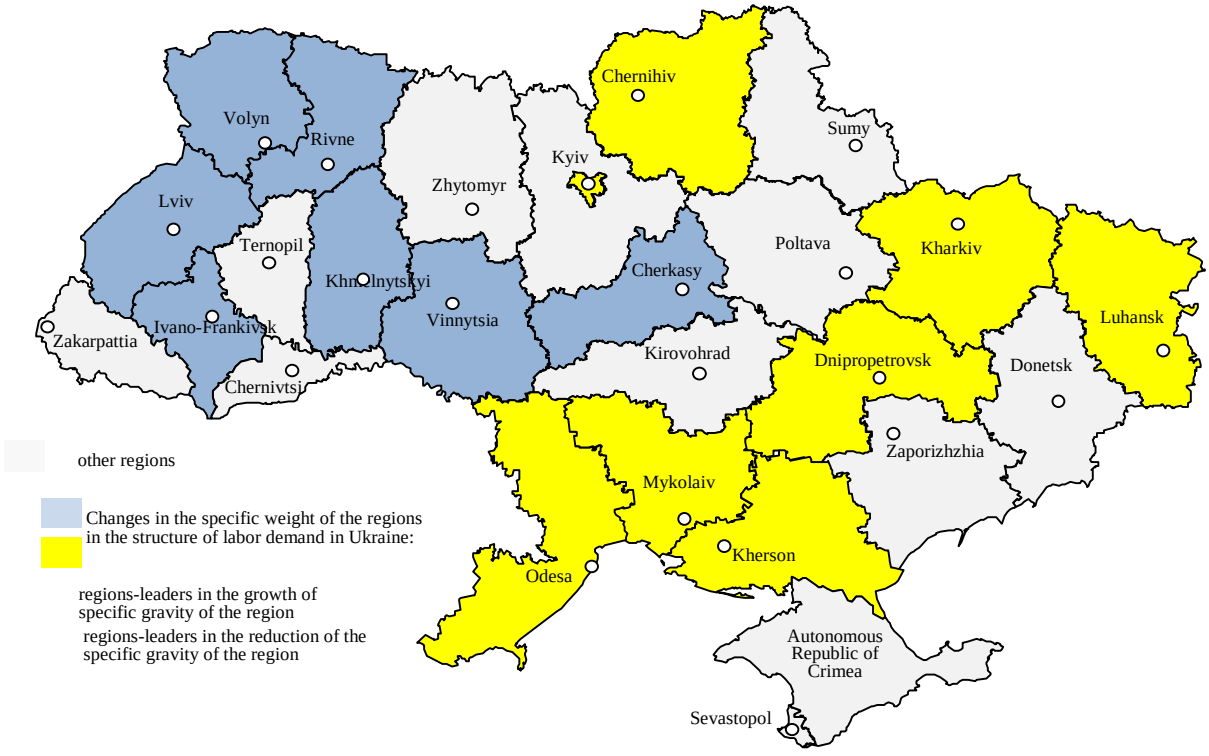

Figure 2 Transformation of the labor demand regional structure in Ukraine, 2014-2023

Source: adapted by the authors based on the SES data (State Employment Service, 2024)

The primary cause of this regional transformation is the closure of numerous enterprises in frontline and occupied territories, and their relocation to safer communities in right-bank Ukraine. Additionally, the labor resource potential has decreased due to population emigration and the migration of IDPs to territorial communities with better employment opportunities and safer living conditions. From the perspective of regional economics, these changes must be viewed as critical, as they signify the exacerbation of labor market shortages and the challenge of maintaining regional labor market equilibrium.

Conclusions

Transformations in Ukraine's labor market, driven by the impact of the Russian-Ukrainian war, pose a threat to national security in terms of workforce reduction and increasing disparities. The study of modern transformations in Ukraine's regional labor markets has revealed substantial spatial shifts in labor demand and supply. In particular, a comparison of two labor supply structures in Ukraine's regions for 2014 and 2023, using Spearman's rank correlation coefficient, revealed significant structural shifts primarily in frontline regions (Luhansk, Donetsk, and Sumy regions), as well as in Kyiv and Kyiv region. A comparative analysis of the labor supply structure, using the uneven distribution coefficient, demonstrated an increase in the asymmetry of the distribution of the unemployed population under the pressure of citizen displacement processes. The assessment of the gender structure of labor supply, conducted using the J_R criterion scale for assessing the degree of significance of differences between two structures, indicated complete identity in values for two-thirds of the country's regions and the absence of complete structural opposition. A comparative analysis of the labor supply structure in terms of urban and rural unemployed populations showed an increase in the disproportionality of labor supply structure by these parameters.

The regional structure of labor demand has also undergone significant changes. There has been a regional polarization of the labor market: a shortage of jobs is observed in the southeastern regions of Ukraine, while a shortage of labor force is noted in the western regions. The reasons for regional disproportionality include the closure of several enterprises in frontline and occupied territories and their relocation to safer communities in the country, as well as the reduction of labor resources due to population emigration.

References:

1. Government portal, 2024. *Denys Shmyhal: The priority of work* for diplomats remains the issue of supplies of Ukrainian goods and products, in particular agricultural. Available at: https://www.kmu.gov.ua/news/denys-shmyhal-priorytetom-roboty-dlia-dyplomativ-zalyshaietsia-pytannia-postavok-ukrainskykh-tovariv-ta-produktsii-zokrema-ahrarnoi [Accessed 15 May 2024].
2. Institute for Demography and Life Quality Problems of the National Academy of Sciences of Ukraine, 2024. ***Ella Libanova: how many people* are actually left in Ukraine – the named number.** Available at: https://idss.org.ua/index [Accessed 18 March 2024].
3. The impact of the Ukraine crisis on the world of work: *Initial assessments*, 2022. ILO. Available at: https://www.ilo.org/europe/publications/WCMS_844295/lang--en/index.htm [Accessed 12 July 2024].
4. Sova, O., 2023. Concordance with the social goals of post-war recovery in the formation and use of Ukrainian local budget funds. *Demography and Social Economy*, 3(53), 54–78. Available at: https://doi.org/10.15407/dse2023.03.054 [Accessed 14 July 2024].

5. State Statistics Service of Ukraine, 2015. *The labor market in 2014*. Available at: https://www.ukrstat.gov.ua [Accessed 15 May 2024].
6. State Employment Service, 2024. *The situation on the registered labor market* and the activities of the State Employment Service. Available at: sytuaciya_na_zareyestr_rp_ta_diyalnist_dsz_12_2023_0.xlsx (live.com) [Accessed 21 June 2024].
7. Yehorova, A., 2023. Research by the "Ukrainian Women's Congress": 68% of refugee women plan to return to Ukraine**.** *Detector Media.* Available at: https://cs.detector.media/community/texts/185810/2023-12-29-doslidzhennya-ukrainskogo-zhinochogo-kongresu-68-zhinok-bizhenok-planuyut-povernutysya-v-ukrainu [Accessed 12 July 2024].
8. Zaiats, T., Romaniuk, S., Kraievska, H., Diakonenko, O., & Sova, O., 2024. Priority areas for the formation of capable territorial communities in Ukraine. *Agricultural and Resource Economics*, 10(1), 135–164. Available at: https://doi.org/10.51599/are.2024.10.01.06 [Accessed 21 June 2024].
9. Zvonar, V., Dyakonenko, O., & Kotenko, T., 2023. Social capital in labor relations influenced by digitalization trends. In S. Wróbel & K. Skonieczny, ed. *Regimes of Capital in the Post-Digital Age*. Series: Routledge Studies in Social and Political. London: Taylor & Francis, 170–178. Available at: https://doi.org/10.4324/9781003372578 [Accessed 21 June 2024].

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